

KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE –49
(An Autonomous College Affiliated to Anna University)
M.C.A – Curriculum 2013

Total Credits – 119

SEMESTER –I

Code No.	Course Title	L	T	P	C
Theory					
P13CAT101	Computer System Architecture	3	0	0	3
P13CAT102	Problem Solving and Programming in C	3	0	0	3
P13CAT103	Database Management Systems	3	0	0	3
P13CAT104	Data Structures	4	0	0	4
P13CAT105	Accounting and Financial Management	3	1	0	4
Practical					
P13CAP101	C and Data Structures Lab	0	0	6	2
P13CAP102	DBMS Lab	0	0	3	1
P13CAP103	Office Automation Lab.(HTML, Excel ,Power Point)	0	0	2	1

Total Credits: 21

SEMESTER –II

Code No.	Course Title	L	T	P	C
Theory					
P13MAT202	Mathematical Foundations of Computer Science	3	1	0	4
P13CAT201	Object Oriented Programming	4	0	0	4
P13CAT202	Computer Graphics and Multimedia Systems	3	0	0	3
P13CAT203	Design and Analysis of Algorithms	3	0	0	3
P13CAT204	Operating Systems	3	0	0	3
P13ENT201	Technical Writing	3	0	0	3
Practical					
P13CAP201	Object Oriented Programming Lab	0	0	6	2
P13CAP202	Graphics and Multimedia Lab	0	0	3	1

Total Credits: 23

SEMESTER –III

Code No.	Course Title	L	T	P	C
Theory					
P13CAT301	Computer Networks	3	1	0	4
P13CAT302	Middleware Technologies	3	1	0	4
P13CAT303	Object Oriented Analysis and Design	3	0	0	3
P13CAT304	Software Engineering	3	0	0	3
	Elective– I	3	0	0	3
Practical					
P13CAP301	Networks Lab	0	0	6	2
P13CAP302	Middleware Lab	0	0	3	1
P13CAP303	Mini Project –I	0	0	2	1
P13CAP304	Technical Seminar – I	0	0	2	1

Total Credits: 22

SEMESTER –IV

Code No.	Course Title	L	T	P	C
Theory					
P13MA7401	Probability and Applied Statistics	3	1	0	4
P13CAT401	Unix Programming	3	0	0	3
P13CAT402	Open Source Technologies	3	0	0	3
P13CAT403	Human Computer Interaction	3	0	0	3
	Elective II	3	0	0	3
Practical					
P13CAP401	Open Source Technologies Lab	0	0	6	2
P13CAP402	Unix Lab	0	0	3	1
P13CAP403	Technical Seminar II	0	0	2	1
P13ENP401	Communication and Soft Skills –I	0	0	2	1

Total Credits: 21**SEMESTER –V**

Code No.	Course Title	L	T	P	C
Theory					
P13CA7501	Software Project Management	3	0	0	3
P13CA7502	Data Warehousing and Data Mining	3	0	0	3
P13CA7503	Mobile Computing	3	0	0	3
	Elective III	3	0	0	3
	Elective IV	3	0	0	3
Practical					
P13CAP501	Software Development Lab	0	0	6	2
P13CAP502	Data Mining Lab	0	0	3	1
P13CAP503	Mini Project –II	0	0	2	1
P13ENP502	Communication and Soft Skills –II	0	0	2	1

Total Credits: 20**SEMESTER –VI**

Code No.	Course Title	L	T	P	C
Practical					
P13CAP601	Project Work	0	0	24	12

Total Credits: 12

LIST OF ELECTIVES

Code No.	Course Title	L	T	P	C
Networks and Distributed Computing					
P13CATE11	Distributed Computing	3	0	0	3
P13CATE12	Unix Internals	3	0	0	3
P13CATE13	Cryptography and Network Security	3	0	0	3
P13CATE14	Distributed Operating Systems	3	0	0	3
P13CATE15	XML and Web Services	3	0	0	3
P13CATE16	Cloud Computing	3	0	0	3
P13CATE17	TCP/IP Protocol Suite	3	0	0	3
Computational Intelligence					
P13CATE21	Agent Based Intelligent System	3	0	0	3
P13CATE22	Business Intelligence	3	0	0	3
P13CATE23	Software Agents	3	0	0	3
P13CATE24	Soft Computing	3	0	0	3
Data Bases					
P13CATE31	Advanced DBMS	3	0	0	3
Management					
P13CATE41	Electronic Commerce	3	0	0	3
P13CATE42	Management Information Systems	3	0	0	3
P13CATE43	Human Resource Management	3	0	0	3
P13CATE44	Enterprise Resource Planning	3	0	0	3
P13CATE45	Knowledge Management	3	0	0	3
Software Quality					
P13CATE51	Software Quality Management	3	0	0	3
P13CATE52	Software Reliability and Metrics	3	0	0	3
P13CATE53	Software Testing	3	0	0	3
General					
P13CATE61	Digital Image Processing	3	0	0	3
P13CATE62	Microprocessor and their Applications	3	0	0	3

LIST OF ELECTIVES OFFERED BY OTHER DEPARTMENT

Code No.	Course Title	L	T	P	C	Department
E13MATE15	Numerical Methods	3	0	0	3	S&H
E13MATE16	Resource Management Techniques	3	0	0	3	S&H

Subjects	Credits
Core	80
Elective	12
Mathematics	08
Value Added Courses	05
Mini Projects	02
Major Project	12
Total	119

SEMESTER – I

P13CA7101

COMPUTER SYSTEM ARCHITECTURE

3 0 0 3

OBJECTIVE:

To provide basic knowledge of numbers systems used in computers, digital components, I/O process and memory components of a digital computer.

UNIT I INTRODUCTION TO DIGITAL DESIGN 9

Data Representation – Data Types – Complements – Arithmetic Operations – Representations – Fixed Point, Floating Point, Decimal Fixed Point – Binary Codes – Logic Gates – Boolean Algebra – Map Simplification.

UNIT II DIGITAL COMPONENTS 9

Combinational Circuits – Half Adder, Full Adder – Flip Flops – Sequential Circuits and its Design – ICs – Decoders – Multiplexers – Registers – Shift Registers – Binary Counters.

UNIT III REGISTER TRANSFER, MICRO OPERATIONS AND PROGRAMMING 11

Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic, Logic and Shift Micro Operations – Arithmetic Logic Shift Unit – Instruction Codes – Computer Registers – Computer Instructions – Timing and Control – Instruction Cycle – Memory Reference Instructions – I/O and Interrupt.

UNIT IV INPUT – OUTPUT ORGANIZATION 7

Peripheral Devices – Input/Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access – Input /Output Processor.

UNIT V MEMORY ORGANIZATION AND CENTRAL PROCESSING UNIT (CPU) 9

Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – CPU: General Register Organization – Control Word – Instruction Format – Addressing Modes – Data Transfer and Manipulation – Program Control.

Total No. of Periods: 45

TEXTBOOK:

1. M.Morris Mano, “Computer System Architecture”, 3rd Edition, Dorling Kindersley (India) Pvt. Ltd. 2007.

REFERENCES:

1. John .P.Hayes, “Computer Architecture and Organization”, Tata McGraw Hill, 1998.
2. V.C. Hamacher, Z.G. Vranesic & S.G.Zaky , “Computer Organization”, Tata McGraw Hill, 2011.

OBJECTIVE:

To learn the basic concepts of computing, problem solving methodology and to develop the programming skills using C language.

UNIT I INTRODUCTION TO COMPUTER PROBLEM SOLVING 9

Problem Solving Techniques – Program Control Structures – Programming Paradigms – Programming Languages – Language Translators – Features of a Good Programming Language.

UNIT II INTRODUCTION TO C 9

Identifiers – Keywords – Data Types – Operators - Expressions – Data Input and Output Statements – Structure of C Program – Debugging and Running a C Program.

UNIT III CONTROL STATEMENT AND FUNCTIONS 9

Control Statements and Functions: If-Else, For-While and Do-While – Switch – Break and Continue Statements – Nested Loops – Functions – Types of Functions – Void Functions - Recursion - Storage Class.

UNIT IV STRUCTURED DATA TYPES 9

Single Dimensional and Two Dimensional Arrays – String Handling Functions – Structures – Array of Structure – Structure within Structure – Union.

UNIT V POINTERS AND FILES 9

Declaration – Passing Pointers to a Function – Pointer and Array – Array of Pointers – Dynamic Memory Allocation – Opening and Closing a File – Reading and Writing a File – Command Line Arguments.

Total No. of Periods: 45

TEXT BOOK:

1. Ashok N. Kamthane, “Computer Programming”, Pearson Education, 2012.
2. Byron S Gottfried, “Programming with C”, 2nd Edition, Tata McGraw Hill, 2010.

REFERENCES:

1. E.Balagurusamy, “Programming in ANSI C”, 6th Edition, Tata McGraw Hill, 2011.
2. Yashavant P. Kanetkar, “Let us C”, 12th Edition, BPB Publications, 2012.

OBJECTIVE:

To provide a basic understanding of the DBMS concepts and SQL and to inculcate the skills to incorporate the use of these in business organizations.

UNIT I INTRODUCTION**9**

Applications and Purpose of Database Systems –View of Data – Database Languages – Database Architecture – Structure of Relational Databases – Database Schema – Keys – Schema Diagrams – Relational Query Languages –Relational Operations.

UNIT II SQL**9**

SQL Data Definition – Basic Structure of Queries and Operations – Aggregate Functions –Nested Sub Queries – Modification of the Databases – Join Expressions – Views – Transactions – Integrity Constraints – Authorization – Accessing SQL from a Programming Language – Functions and Procedures – Triggers.

UNIT III DATABASE DESIGN**9**

Entity – Relationship (ER) Model – Basic Concepts – Constraints – Removing Redundant Attributes in Entity Sets – ER Diagrams – Relational Database Design – First Normal Form – Second Normal Form – Third Normal Form – Boyce–Codd Normal Form – Case Study.

UNIT IV DATA STORAGE AND INDEXING**10**

Storage and File Structure: Physical Storage Media – Magnetic Disk and Flash Storage – RAID – File Organization – Organization of Records in File – Data – Dictionary Storage – Indexing and Hashing: Basic Concepts –Ordered Indices – B+ Tree Index Files – Multiple Key Access – Static Hashing –Dynamic Hashing – Comparison of Ordered Indexing and Hashing.

UNIT V TRANSACTION MANAGEMENT**8**

Transaction Concept and Model – Transaction Atomicity and Durability – Transaction Isolation – Serializability – Transaction Isolation and Atomicity – Concurrency Control: Lock Based Protocol – Deadlock Handling – Recovery Systems: Failure Classification – Recovery and Atomicity – Buffer Management – Remote Backup Systems.

Total No. of Periods: 45**TEXT BOOK:**

1. Abraham Silberschatz, Henry F.Korth & S.Sudarshan, “Database System Concepts”, 6th Edition, Tata McGraw Hill International Edition, 2011.
2. Raghunathan Ramakrishnan & Johannes Gehrke, “Database Management Systems”, 3rd Edition, Tata McGraw Hill International Edition, 2003.

REFERENCES:

1. Elmasri & Navathe, “Fundamentals of Database Systems”, 5th Edition, Pearson Education, 2008.
2. C.J Date, A.Kannan & S.Swamynathan, “An Introduction to Database Systems”, 8th Edition, Dorling Kindersley Ltd, 2007.

OBJECTIVE:

The objective is to assess how the choice of data structures impact the performance of programs and to choose the appropriate data structure design method for a specified application.

UNIT I INTRODUCTION**12**

Introduction – Arrays – Structures – Stack: Definition and Examples, Representing Stacks – Queues and Lists: Queue and its Sequential Representation, Lists – Linked Lists and Other List Structures.

UNIT II TREES**12**

Binary Trees – Operations on Binary Trees – Binary Tree Representations – Node Representation, Internal and External Nodes, Implicit Array Representation – Binary Tree Traversals – Huffman Algorithm – Representing Lists as Binary Trees.

UNIT III TABLES**12**

Introduction – Hash Table: Hash Functions – Open Addressing – Brent’s Method – Binary Tree Hashing – Coalesced Hashing – Separate Chaining – Dynamic Hashing – Extendible Hashing – Linear Hashing.

UNIT IV SORTING AND SEARCHING**12**

General Background – Exchange Sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – Basic Search Techniques – Tree Searching – General Search Trees.

UNIT V GRAPHS AND THEIR APPLICATIONS**12**

Graphs – An Application of Graphs – Representation – Transitive Closure – Warshall’s Algorithm – Shortest Path Algorithm – A Flow Problem – Dijkstra’s Algorithm – An Application of Scheduling – Linked Representation of Graphs – Graph Traversals.

Total No. of Periods: 60**TEXTBOOK:**

1. Aaron M Tanenbaum, Yedidyah Langsam & Moshe J Augenstein, “ Data Structures using C” Pearson Education , 2004.
2. Yedidyah Langsam, Moshe J. Augenstein & Aaron M Tenenbaum, "Data structures using C and C++", Pearson Education, 2004.(Unit-III)

REFERENCES:

1. Robert Kruse & Clovis L. Tondo, “Data Structures and Program Design in C”, Prentice Hall, 2nd Edition, 2007.
2. Weiss, “Data Structures and Algorithm Analysis in C++”, Addison Wesley, 2nd Edition, 2007.
3. Sahni Sartaj, “Data Structures, Algorithms and Applications in C++”, WCB / Tata McGraw Hill, 2005.

OBJECTIVE:

To understand the basic concepts and conventions of accounting principles and to ensure safety on investment.

UNIT I FINANCIAL ACCOUNTING 11

Meaning and Scope of Accounting – Principles – Concepts and Conventions – Double Entry Book Keeping – Books of Accounts: Preparation of Journals – Ledger – Trial Balance – Trading, Profit and Loss Account – Balance Sheet.

UNIT II COST ACCOUNTING 11

Meaning – Objectives – Elements of Cost – Preparation of Cost Sheet – Methods of Costing – Marginal Costing – Cost Volume Profit Analysis – Break Even Analysis – Fund Flow Analysis – Cash Flow Analysis.

UNIT III BUDGETS AND BUDGETING CONTROL 9

Budgets and Budgetary Control – Meaning – Types – Sales Budget – Production Budget – Cost of Production Budget – Flexible Budgeting – Cash Budget – Master Budget – Zero Base Budgeting.

UNIT IV FINANCIAL MANAGEMENT AND COST OF CAPITAL 7

Objectives and Functions of Financial Management – Cost of Capital – Factors Affecting Cost of Capital – Capital Budgeting: Net Present Value – Internal Rate of Return – Profitability Index – Pay – Back and Discounted Pay – Back Method.

UNIT V CAPITAL STRUCTURE AND WORKING CAPITAL MANAGEMENT 7

Capital Structure – Factors Affecting Capital Structure – Dividend Policy – Types of Dividend Policy – Concepts of Working Capital – Working Capital Policies – Factors Affecting Working Capital – Estimation of Working Capital Requirements.

L 45 T 15 Total No. of Periods: 60

TEXTBOOK:

1. S.N.Maheswari, “Financial and Management Accounting”, Sultan Chand & Sons, 2009.
2. R.K Sharma & Shashi V. K.Gupta, “Management Accounting, Principles of Practice”, Kalyani Publishers, 2006.
3. I.M.Pandey, “Financial Management”, Vikas Publications, 2010.

REFERENCES:

1. S.P.Iyengar, “Cost and Management Accounting”, Sultan Chand & Co, 2008.
2. I.M.Pandey, “Elements of Management Accounting”, Vikas Publishing House, 2008.
3. R.L Gupta & V.K.Gupta, “Financial Accounting”, Sultan Chand & Sons, 2004.

OBJECTIVE:

To learn the C programming language and to implement various data structures.

EXERCISES

1. String Manipulation.
 - (i) Concatenating two strings
 - (ii) Reversing the string
 - (iii) Finding a substring
 - (iv) Replacing a string
 - (v) Finding the length of the string
2. Implement C program to Find Minimum and Maximum Element in Array.
3. Implement C program to Find GCD of a Number using Recursion.
4. Implement C program using Function Returning a Pointer.
5. Implement C program using Structures.
6. Implement C program using File Operations.
7. Implement C program using Function Calls.
8. Create a Stack and do the following operations (Using arrays and linked lists).
 - (i) Push
 - (ii) Pop
 - (iii) Peep
9. Create a Queue and do the following operations (Using arrays and linked lists).
 - (i) Add
 - (ii) Remove
 - (iii) Display
10. Implement the following operations on a Binary Search Tree.
 - (i) Insert a node
 - (ii) Delete a node
 - (iii) Search for a node
11. Find the Shortest Path in a given Graph using Dijkstra Algorithm.
12. Perform the following operations in a given Graph.
 - (i) Depth First Search
 - (ii) Breadth First Search

To develop an application package using the various concepts.

OBJECTIVE:

The objective is to get familiar with the functionality and support provided by popular DBMS and to understand its usage to meet the data storage and organization requirements.

EXERCISES

1. Execute a DDL, DML, DCL and TCL commands for a Table.
(Use necessary constraints during the creation of a table)
2. Execute SQL Functions.
(Group, Character, Number, Date and conversion functions, etc.)
3. Execute various Joins and Sub Queries.
4. Create and Manipulate various DB Objects for a Table.
(Views, synonyms, indexes, sequences)
5. Write PL/SQL procedure for an application using Exception Handling.
6. Write PL/SQL procedure for an application using Cursors.
7. Write a PL/SQL program to prepare reports for an application using Functions.
8. Write a PL/SQL block for transaction operations of a typical application using Triggers.
9. Write a PL/SQL block for transaction operations of a typical application using Package.

Design and develop an application using any Front end and Back end tool (make use of ER diagram).

Typical Applications –Banking, Electricity Billing, Library Operation, Payroll, Insurance, Inventory, Reservation etc.

OBJECTIVE:

To provide basic knowledge of computer usage and make students familiar with general purpose office automation tools.

EXERCISES

1. Prepare a Student Resume using various features of Word Processor.
2. Create a News Paper format document in Word Processor.
3. Prepare a Greeting Card for New Year in a Word Processor.
4. Create a Business Letter using Mail Merge in a Word Processor.
5. Create a Glossary using a Word Processor.
6. Create an Index using a Word Processor.
7. Prepare a Mark List of Students displaying student roll number, name, marks, total, average and grade in a Spread Sheet Application.
8. Create a Chart to illustrate the performance of above list of students (include roll number, name and average).
9. Create Macros using a Spread Sheet Application.
10. To create a Database of Employees of an Organization with Personal information and Salary details using tables.
11. Create Relationship between Tables in an Employee database. Write appropriate queries.
12. Design a form to display Employee Personal Information for the above Database.
13. Create a Power Point Presentation for a given theme.
14. Create a Website using HTML tags.

SEMESTER – II

P13MAT202 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE 3 1 0 4

OBJECTIVES:

On completion of the subject, the students are expected

- to know about matrices, to find eigen values and eigen vectors of a matrix .
- to understand the concepts of set theory and relations.
- to understand mathematical logic (propositional and predicate logic).
- to analyse various languages and grammars.
- to understand the basics of finite state automata and to know the conversion of NFA to DFA.

UNIT I MATRIX ALGEBRA 9

Matrices – Rank of Matrix – Solving System of Equations – Eigen values and Eigen vectors – Inverse of a Matrix – Cayley Hamilton Theorem.

UNIT II BASIC SET THEORY 9

Basic Definitions – Venn Diagrams and set operations – Laws of set theory – Principle of inclusion and exclusion – partitions – Relations – Properties of relations – Matrices of relations – Functions – injective, surjective and bijective functions.

UNIT III MATHEMATICAL LOGIC 9

Propositions and logical operators – Truth table – Equivalence and implication – Basic laws – Functionally complete set of connectives– Normal forms – Proofs in Propositional calculus – Predicate calculus.

UNIT IV FORMAL LANGUAGES 9

Languages and Grammars–Phrase Structure Grammar – Classification of Grammars – Pumping Lemma for Regular Languages – Context Free Languages.

UNIT V FINITE STATE AUTOMATA 9

Finite State Automata – Deterministic Finite State Automata(DFA), Non Deterministic Finite State Automata (NFA) – Equivalence of DFA and NFA – Equivalence of NFA and Regular Languages.

L+ T: 45+15 = 60

TEXT BOOK:

1. McGraw Kenneth.Rosen H., “Discrete Mathematics and Its Applications”, Tata MCGraw Hill, 7th Edition 2011.
2. Venkatraman M. K., “Engineering Mathematics”, 2nd Edition Volume II, National Publishing Company, 1989.

OBJECTIVE:

To learn the concepts of object oriented programming (OOP) and to implement them using C++ and Java.

UNIT I BASICS OF OOP AND INTRODUCTION TO C++ 12

Programming Paradigms – Characteristics of Object Oriented Programming – C++ Programming Basics – Functions – Objects and Classes – Arrays and Strings – Pointers.

UNIT II FEATURES IN C++ 12

Operator Overloading – Inheritance – Virtual Functions – Friend Functions – Static Functions – Exception Handling – I/O Streams – File I/O.

UNIT III JAVA FUNDAMENTALS 12

Java Overview – Data Types – Operators – Control Statements – Classes – Packages and Interfaces – Exception Handling.

UNIT IV PACKAGES 12

The Applet Class – Introducing the AWT – Layouts – Event Handling – Garbage Collection – Multithreaded Programming – Language Package.

UNIT V ADVANCED JAVA PROGRAMMING 12

Utility Package – Input Output Package – Inner Classes – Java Database Connectivity (JDBC) – Servlets – Remote Method Invocation (RMI).

Total No. of Periods: 60

TEXT BOOK:

1. Robert Lafore, “Object Oriented Programming in C++”, 4th Edition, Sams Publishing, 2002. (Units I & II).
2. Herbert Schildt, “The Complete Reference –Java”, 7th Edition, Tata McGraw Hill, 2007. (Units III, IV & V).

REFERENCES:

1. Bjarne Stroustrup, “The C++ Programming Language”, 3rd Edition, Addison Wesley, 2000.
2. Radha Krishna P, “Object Oriented Programming through JAVA”, Universities Press, 2008.

OBJECTIVE:

To understand the basic concepts, principles and techniques of computer graphics systems, analyze the various algorithms used in the design of two dimensional and three dimensional graphics and to introduce the multimedia technologies and components.

UNIT I INTRODUCTION**9**

Overview of Graphics System – Line Drawing Algorithms: Digital Differential Analyzer, Bresenham Technique – Circle Generating Algorithms – Color Models: XYZ, RGB, YIQ, CMY and HSV Models.

UNIT II 2D TRANSFORMATIONS**9**

Two-Dimensional Geometric Transformations – The Viewing Pipeline – Window to View Port Coordinate Transformation – Line Clipping: Cohen-Sutherland and Liang Barsky Line Clipping – Text Clipping – Logical Classification of Input Devices – Interactive Picture Construction Techniques.

UNIT III 3D TRANSFORMATIONS**9**

Three Dimensional Concepts – Translation, Scaling and Rotations – Polygon Surfaces – Spline Representations – Bezier Curves and Surfaces – Parallel and Perspective Projections – Visible Surface Detection Methods: Back-Face Detection, Depth-Buffer, A-Buffer, Scan-Line, Depth – Sorting and BSP Tree Methods – Polygon Rendering Methods.

UNIT IV OVERVIEW OF MULTIMEDIA**8**

Introduction to Multimedia – Uses of Multimedia – Interaction Technologies and Devices – Compression Technologies for Multimedia.

UNIT V MULTIMEDIA COMPONENTS**10**

Text – Digital Images – Basic Image Editing Steps – Digital Audio – Video and Animation – Creating Animation in Flash.

Total No. of Periods: 45**TEXT BOOK:**

1. Donald Hearn & M. Pauline Baker, “Computer Graphics –C Version (for Anna University)”, 2nd Edition, Pearson Education, 2011. (Units I,II & III)
2. Ashok Banerji & Ananda Mohan Ghosh, “Multimedia Technologies”, Tata McGraw Hill, 2010. (Units IV & V)

REFERENCES:

1. Tay Vaughan, “Multimedia: Making it Work”, 7th Edition, Tata McGraw Hill, 2008.
2. Judith Jeffcoate, “Multimedia in Practice: Technology and Applications”, Pearson Education, 2011.

OBJECTIVE:

The objective of this course is to study paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.

UNIT I INTRODUCTION**9**

Fundamentals of Algorithm – Problem Solving – Important Problem Types – Fundamentals of the Analysis of Algorithm Efficiency – Analysis Framework – Asymptotic Notations – Mathematical Analysis for Recursive and Non Recursive Algorithms.

UNIT II DIVIDE AND CONQUER AND GREEDY METHODS**9**

Divide and Conquer Methodology – Merge Sort – Quick Sort – Binary Search – Binary Tree Traversal – Multiplication of Large Integers – Strassen’s Matrix Multiplication – Greedy Method – Prim’s Algorithm – Kruskal’s Algorithm – Dijkstra’s Algorithm.

UNIT III DYNAMIC PROGRAMMING**9**

Computing a Binomial Coefficient – Warshall’s and Floyd’s Algorithm – Optimal Binary Search Tree – Knapsack Problem – Memory Functions.

UNIT IV BACKTRACKING, BRANCH AND BOUND METHODS**9**

Backtracking – N-Queens Problem – Hamiltonian Circuit Problem – Subset Sum Problem – Branch and Bound – Assignment Problem – Knapsack Problem – Traveling Salesman Problem.

UNIT V NP-HARD AND NP-COMPLETE PROBLEMS**9**

P and NP Problems – NP Complete Problems – Approximation Algorithms for NP – Hard Problems – Traveling Salesman Problem – Knapsack Problem.

Total No. of Periods: 45**TEXT BOOK:**

1. Anany Levitin, “Introduction to the Design and Analysis of Algorithms”, 2nd Edition, Pearson Education, 2007.

REFERENCES:

1. Thomas H. Cormen, Charles E. Leiserson, & Ronald L. Rivest, “Introduction to Algorithms”, 3rd Edition Prentice Hall, MIT Press, 2009.
2. Horowitz Ellis & Sartaj Sahni, “Fundamentals of Computer Algorithms”, Galgotia Publications, 2004.

OBJECTIVE:

To learn about the fundamentals and working principles of various operating systems.

UNIT I INTRODUCTION**7**

Introduction – Computer System Organization – Computer System Architecture – Operating System Structure – Operating System Services – User Operating System Interface – System Calls – System Programs – Design and Implementation – Virtual Machines – Debugging – Operating System Generation.

UNIT II PROCESS MANAGEMENT AND SCHEDULING**8**

Process Concepts – Process Scheduling – Operations on Processes – Inter Process Communication – Examples – Threads – Overview – Multi Threading Models – Libraries – Issues – Scheduling Basic Concepts – Scheduling Criteria Algorithms – Thread Scheduling – Multiprocessor Scheduling – Examples.

UNIT III PROCESS SYNCHRONIZATION**10**

Background – Critical Section Problem – Peterson’s Solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – System Model – Deadlock Characterization – Handling Deadlocks – Deadlock Prevention – Avoidance – Detection – Recovery.

UNIT IV MEMORY MANAGEMENT**10**

Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Virtual Memory – Background – Demand Paging – Copy on Write – Page Replacement – Thrashing – Memory Mapped Files – Allocating Kernel Memory.

UNIT V FILE SYSTEMS**10**

File Concept – Access Methods – Directory and Disk Structure – File System Mounting – File Sharing – Protection – File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Recovery – Case Studies.

Total No. of Periods: 45**TEXT BOOK:**

1. Silberschatz & Galvin, “Operating System Concepts”, 8th Edition, John Wiley & Sons, Inc., 2008.

REFERENCES:

1. P.C.Bhatt, “An Introduction to Operating Systems–Concepts and Practice”, Prentice Hall of India, 2010.
2. H.M.Deitel, “An Introduction to Operating Systems”, 3rd Edition, Pearson Education, 2003.
3. William Stallings, “Operating Systems: Internals and Design Principles”, Prentice Hall, 2011.
4. D. M. Dhamdhare, “Operating Systems a Concept based Approach”, Tata McGraw Hill, 2006.

OBJECTIVE:

- Acquaint Learners with key Techniques of Technical Writing
- Develop Effective Professional Writing Styles

UNIT I LEXIS AND TECHNICAL SYNTAX**9**

Distinctions between Ordinary and Technical Writing –Accuracy, Brevity, Clarity – Consolidating a phrase into a word –Definitions, Articles, Sentence Types (Statement, Imperative, Interrogative, Exclamatory), Letters–Invitations.

UNIT II GLIMPSES ON TECHNICAL WRITING**9**

Word Classes – Classification of Verbs, Tense, Reading Comprehension, Techniques of Paragraph Construction, Plea for Medical Leave.

UNIT III SCIENTIFIC DISCOURSE**9**

Modals in Discourse, Punctuation, Editing – Sequencing Sentences & Paragraphs, Thematic Writing, Compiling Product Profiles –Descriptive writing, Resume & Cover Letters.

UNIT IV CRYPTIC COMMUNICATION**9**

Active and Passive voice – Synonyms – Comparative Adjectives, Adverbs used as Discourse Markers, Need for Graphics –Encoding and Decoding Details, Serving Resignation Notice.

UNIT V INDUSTRIAL CORRESPONDENCE**9**

Antonyms – Conditional Clause – Reported Speech – Request Letters for internship, industrial visit, in–plant training.

TOTAL NO. OF PERIODS – 45**REFERENCES:**

1. Ashraf Rizvi, “Effective Technical Communication”, Tata Mc Graw Hills Publications, 2006, ISBN: 0070599521
2. Mitra.K.Barun,“Effective Technical Communication”,– Oxford University Press, New Delhi. ISBN: 0195682962
3. Gerson. J.Sharon and Gerson.M.Steven, “ Technical Writing – Process and Product” 3rd Edition, Pearson Education, Asia, 2001, ISBN 8178083817

OBJECTIVE:

To learn the concepts of Object Oriented Programming using C++ and Java.

EXERCISES

1. Programs using Constructor and Destructor.
2. Program to Count the Number of Objects Created for a Class using Static Member Function.
3. Programs using Function Overloading and Operator Overloading.
4. Programs using Inheritance.
5. Programs using Friend Functions.
6. Programs using Virtual Functions.
7. Program to achieve Inter Thread Communication and Deadlock Avoidance.
8. Program to implement the File Operations like read, write, delete and update.
9. Program using Applets.
10. Program using JDBC.
11. Program to illustrate the use of Remote Method Invocation.

An Application package using the above concepts.

Note:

The exercises of 'Object Oriented Programming Lab' to be implemented both in C++ and JAVA (in parallel) for all the common concepts.

OBJECTIVE:

The objective is to make students aware of the concepts in underlying Computer Graphics and Multimedia Technology such as image editing, animation etc.

EXERCISES

1. Program to study the fundamental built-in Graphics Functions.
2. Program to draw a Line using Bresenham and Digital Differential Analyzer (DDA) Algorithms.
3. Program to generate a Circle using Bresenham Circle Drawing Algorithm.
4. Program to clip a line against a given boundary using Line Clipping Algorithms.
5. Program to implement 2D Transformations like Translation, Scaling and Rotation.
6. Program to generate Bezier Curves for given Control Points.
7. Program to generate frame by frame Animation using Multimedia Flash.
8. Program to create an Advertisement for a Product using techniques like Guide Layer, Masking, Morphing, Onion Skin etc. using Flash.
9. Program to create an Image and demonstrate basic Image Editing using Photoshop.
10. Program to demonstrate Rasterization and Filtering of Layers, Blending Effects, Text Effects etc. using Photoshop.

SEMESTER III

P13CA7301

COMPUTER NETWORKS

3 1 0 4

OBJECTIVE:

To help students understand the basics of data communications and networking, and the protocols used in the Internet in particular by using the protocol layering of the Internet and TCP/IP protocol suite.

UNIT I PHYSICAL LAYER

9

Introduction – Network Models – OSI Model – Layers in the OSI Model – Digital Transmission – Analog Transmission – Transmission Media – Guided Media – Unguided Media.

UNIT II DATALINK LAYER

9

Switching – Circuit-Switched Networks – Datagram Networks – Virtual-Circuit Networks – Error Detection and Correction – Data Link Control – Multiple Access – Wired LANs – Wireless LANs – Connecting LANs, Backbone Networks – Virtual LANs.

UNIT III NETWORK LAYER

9

Logical Addressing – IPv4 Addresses – IPv6 Addresses – Internet Protocol – IPv4 – IPv6 – Network Layer - Delivery - Forwarding – Unicast Routing Protocols – Unicast Routing Protocols.

UNIT IV TRANSPORT LAYER

9

Process –to–Process Delivery – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control and Quality of Service (QoS) – Congestion Control – Techniques to Improve QoS – Integrated Services – Differentiated Services.

UNIT V APPLICATION LAYER

9

Domain Name System (DNS) – Name Space – DNS – Distribution of Name Space – DNS in the Internet – Resolution – DNS Messages – Types of Records – Remote Logging – Electronic Mail – File Transfer – World Wide Web (WWW) – Hyper Text Transfer Protocol (HTTP) – Security – Cryptography – Network Security.

L 45 T 15

Total No. of Periods: 60

TEXT BOOK:

1. Behrouz A. Forouzan, “Data Communication and Networking”, Tata McGraw Hill, 5th Edition, 2010.

REFERENCES:

1. Andrew S.Tanenbaum, “Computer Networks”, Prentice Hall, 4th Edition 2003.
2. Larry L. Peterson & Bruce S. Davie, “Computer Networks: A Systems Approach”, 4th Edition, Morgan Kaufmann Publishers, 2007.

OBJECTIVE:

To learn about the overview of Client/Server concepts, Middleware, Remote Procedure Call (RPC), EJB architecture, .NET applications, COM and CORBA.

UNIT I CLIENT / SERVER CONCEPTS 9

Client/Server – File Server – Database Server – Group Server – Object Server – Web Server – Middleware – General Middleware – Service Specific Middleware – Client/Server Building Blocks – RPC – Messaging – Peer to Peer.

UNIT II EJB ARCHITECTURE 9

EJB – EJB Architecture – Overview of EJB Software Architecture – View of EJB Conversation – Building and Deploying EJBs – Roles in EJB.

UNIT III EJB APPLICATIONS 9

EJB Session Beans – EJB Entity Beans – EJB Clients – EJB Deployment – Building an Application with EJB.

UNIT IV .NET APPLICATIONS 9

Introduction to .NET – Overview of .NET Architecture – CLR – Building an Application with .NET using Component.

UNIT V COM AND CORBA 9

COM – Data Types – Interfaces – Proxy and Stub –Marshalling – Implementing Server / Client – CORBA –Distributed Systems – Purpose – Exploring CORBA Alternatives – Architecture Overview – IDL – ORB – Building an Application with CORBA – Comparison COM and CORBA.

L 45 T 15 Total No. of Periods: 60

TEXT BOOK:

1. Robert Orfali, Dan Harkey & Jeri Edwards, “The Essential Client/Server Survival Guide”, Wiley India Edition, 2007.
2. Tom Valesky, “Enterprise Java Beans”, Pearson Education, 2008.
3. Jason Pritchard, “COM and CORBA side by side”, Addison Wesley, 2009.
4. Jesse Liberty, “Programming C#”, 2nd Edition, O’Reilly Press, 2005.

REFERNCES:

1. Mowbray, “Inside CORBA”, Pearson Education, 2006.
2. Chris Britton and Peter Eye, “IT Architecture and Middleware”, Pearson Education, 2nd Edition, 2004.

OBJECTIVE:

To introduce the fundamental principles of object oriented approaches in modeling software requirements and design.

UNIT I INTRODUCTION**6**

An Overview – Object Basics – Object State and Properties – Behavior – Methods – Messages – Encapsulation and Information Hiding – Class Hierarchy – Polymorphism – Object Relationships and Associations – Aggregations – Identity – Dynamic binding – Persistence – Metaclasses – Object Oriented System Development Life Cycle.

UNIT II METHODOLOGY AND UML**9**

Introduction – Survey – Rumbaugh, Booch, Jacobson Methods – Unified Approach – Unified Modeling Language – Static and Dynamic Models – UML Diagrams – Class Diagram – Use Case Diagrams – Dynamic Modeling – Model Management – Extensibility.

UNIT III OBJECT ORIENTED ANALYSIS**9**

Identifying Use Cases – Business Object Analysis – Use Case Driven Object Oriented Analysis – Use Case Model – Documentation – Classification – Approaches to Identifying Classes – Identifying Object, Relationships, Attributes, Methods: Super – Sub Class Relationships – A-part-of Relationships – Aggregation – Identifying Attributes and Methods – Object Responsibility.

UNIT IV OBJECT ORIENTED DESIGN**9**

Design process – Axioms – Corollaries – Designing Classes – Class Visibility – Refining Attributes – Methods and Protocols – Object Storage and Object Interoperability – Distributed Databases – Object Oriented Database Management Systems – Object Relational Systems – Multidatabase Systems – Designing Access Layer Classes – Designing Interface Objects – Macro and Micro Level Processes – The Purpose of a View Layer Interface.

UNIT V DESIGN PATTERNS**12**

Introduction – Patterns – Frameworks – Creational Patterns: Abstract Factory – Prototype – Singleton – Structural Patterns: Adapter – Composite – Proxy – Behavioral Patterns – Things to Expect from Design Patterns.

Total No. of Periods: 45**TEXT BOOK:**

1. Ali Bahrami, “Object Oriented System Development”, Tata McGraw Hill International Edition, 2008.
2. Erich Gamma, Richard Helm, Ralph Johnson & John Vlissides, “Design Patterns Elements of Reusable Object–Oriented Software”, Addison Wesley Professional Computing Series, 2009. (Unit V).

REFERENCES:

1. Craig Larman, “Applying UML and Patterns”, 2nd Edition, Pearson, 2002.
2. Michael R Blaha A & James R Rumbaugh, “Object–Oriented Modeling and Design with UML”, 2nd Edition, Pearson Education, 2004.

OBJECTIVE:

To develop skills to construct reliable software of high quality that is reasonably easy to understand, modify and maintain.

UNIT I INTRODUCTION**9**

Introduction to Software Engineering – A Generic Process Model – Prescriptive Process Models: Waterfall, Incremental, Prototyping, Spiral Model – The Unified Process – Agile Development: Agile Process – Extreme Programming (XP) – Adaptive Software Development – Scrum.

UNIT II MODELING**9**

Modeling Principles – Understanding Requirements – Requirements Modeling: Scenario-Based, Data, Class-Based, Flow-Oriented, Behavioral and Web Application Modeling.

UNIT III SOFTWARE DESIGN**9**

Design Concepts – Design Models – Architectural Design: Software Architecture – Architectural Styles – Architectural Design – Component Level Design: Component – Designing Class Based and Traditional Components – Web Application Design.

UNIT IV QUALITY MANAGEMENT**10**

Review Techniques – A Strategic Approach to Software Testing – Unit testing – Integration Testing – Validation Testing – System Testing – Software Testing Fundamentals – Basis Path Testing – Control Structure Testing – Equivalence Partitioning – Boundary Value Analysis – Testing Web Applications.

UNIT V SCM, MAINTENANCE AND REENGINEERING**8**

Software Configuration Management (SCM) – SCM Repository – SCM Process – Maintenance – Supportability – Reengineering – Business Process Reengineering – Software Reengineering.

Total No. of Periods: 45**TEXT BOOK:**

1. Roger Pressman.S., “Software Engineering: A Practitioner's Approach”, 7th Edition, Tata McGraw Hill, 2010.

REFERENCES:

1. Pfleeger & Atlee, “Software Engineering”, Pearson Education, 2006.
2. Carlo Ghezzi, Mehdi Jazayari & Dino Mandrioli, “Fundamentals of Software Engineering”, Prentice Hall of India, 2010.
3. Ian Sommerville, “Software Engineering”, 8th Edition, Pearson Education, 2009.

OBJECTIVE:

To give the required knowledge on the functioning of the various protocols used in the TCP/IP protocol suite.

EXERCISES

1. Program to implement :
 - a. TCP Sockets
 - b. UDP Sockets
 - c. Applications using Sockets
2. Program to Simulate ARP/RARP Protocols.
3. Program to Simulate Sliding Window Protocol.
4. Program to Simulate Routing Protocols.
5. Program to simulate Remote Procedure Call (RPC).
6. Program to Implement Domain Name System and Hypertext Transfer Protocol (DNS, HTTP).

OBJECTIVE:

To provide a practical experience to develop an Enterprise Java Bean, COM, DCOM, and .NET applications.

EXERCISES

1. Create a distributed application to download various files from various servers using RMI.
2. Develop an Enterprise Java Bean for Basic Arithmetic Operations.
3. Develop an Enterprise Java Bean for Banking operations.
4. Develop an Enterprise Java Bean for Library operations.
5. Develop an Enterprise Java Bean for User Registration and Login operation.
6. Develop a Component for Converting the Currency Values using COM / .NET.
7. Develop a Component for Encryption and Decryption using COM / .NET.
8. Develop a Component for Retrieving Information from Message Box using DCOM / .NET.
9. Develop a Middleware Component for Retrieving Stock Market Exchange Information using CORBA.
10. Develop a Middleware Component for Retrieving Weather Forecast Information using CORBA.

SEMESTER –IV

P13MAT401

PROBABILITY AND APPLIED STATISTICS

3 1 0 4

OBJECTIVES:

On completion of the course, the students are expected

- to know the use of measures of central tendency, dispersion and correlation for analysis of data.
- to understand the concepts of probability and random variables.
- to know about some standard distributions and their properties.
- to be able to test hypothesis using various tests for large and small samples.
- to analyse experiments based on one-way, two-way and Latin square classifications.
- to understand the basics of quality control using control charts.

UNIT I STATISTICAL MEASURES

9

Measures of central tendency: Mean, Median and Mode –Measures of variation –Range, standard deviation, Mean deviation and coefficient of variation. Correlation and Regression: Karl Pearson's coefficient of correlation –Rank Correlation –Regression lines (Definitions and simple numerical problems only).

UNIT II PROBABILITY AND RANDOM VARIABLE

9

Axioms of probability – Conditional probability – Total probability –Baye's theorem – Random variable –Distribution function –properties – Probability function – Probability density function – moments and moment generating function –properties.

UNIT III STANDARD DISTRIBUTIONS

9

Binomial, Poisson and Normal distributions –properties– Fitting of Binomial, Poisson and normal distributions to data.

UNIT IV TESTING OF HYPOTHESIS

9

Testing of hypothesis for large samples (single mean, difference of means, single proportion, difference of proportions) – Small samples tests based on t and F distributions (single mean, difference of means, paired t-test and variance ratio test) –Chi-square test for independence and goodness of fit – Simple numerical problems only.

UNIT V DESIGN OF EXPERIMENTS AND QUALITY CONTROL

9

Analysis of variance –One way classification –Two way classification –CRD – RBD – Latin square –LSD Concept of process control – Control charts for variables – \bar{X} , R –charts –Control charts for attributes –p, np, c –charts –Tolerance limits.

L + T: 45 + 15 TOTAL: 60

TEXT BOOK:

1. Veerarajan T, “Probability and Statistics”, Tata McGraw–Hill, New Delhi, 2007 & 2nd Reprint 2004.
2. Gupta S. P, “Statistical Methods”, Sultan Chand & Sons Publishers, 2004. (Unit – I)

REFERENCES:

1. Johnson R. A, “Miller & Freund’s Probability and Statistics for Engineers”, 6th Edition, Pearson Education, Delhi, 2000.
2. Gupta S.C, & Kapur, J.N., “Fundamentals of Mathematical Statistics”, Sultan Chand, Ninth Edition, New Delhi, 1996.
3. Walpole R. E., Myers S.L. & Keying Ye, “Probability and Statistics for Engineers and Scientists”, Pearson Education Inc, 2002.

OBJECTIVES:

To learn the environment of Unix and to implement the concepts of networks.

UNIT I INTRODUCTION TO UNIX AND FILE SYSTEM 9

Unix Architecture and Command Usage - General Purpose Utilities – File System – Handling Ordinary Files – Basic File Attributes – Essential Shell Programming – File I/O – Files and Directories – System Data Files and Information: Password File – Group File – Login Accounting.

UNIT II PROCESSES 9

Process Environment – Process Control – Process Relationships: Terminal Logins – Network Login – Process Groups – Session – Job Control – Signals.

UNIT III INTERPROCESS COMMUNICATION 9

Introduction – Message Passing (SVR4) – Pipes – FIFO – Message Queues – Semaphores – Shared Memory.

UNIT IV SOCKETS 9

Introduction – Transport Layer – Socket Introduction – Elementary TCP Sockets – UDP Sockets – Socket Options – Name and Address conversions.

UNIT V APPLICATIONS 9

Debugging Techniques – TCP Echo Client Server – UDP Echo Client Server – Ping – Trace Route – Client Server Applications like File Transfer and Chat.

Total No. of Periods: 45

TEXT BOOK:

1. W. Richard Stevens, “Advanced Programming in the UNIX Environment”, Addison Wesley, New Delhi, 2008.
2. W. Richard Stevens, Bill Fenner, & Andrew Rudoff, “Unix Network Programming”, Volume 1, The Sockets Networking API, Pearson Education, New Delhi, 2011.
3. Sumithabha Das, “Unix System V.4 –Concepts and Applications”, Tata McGraw Hill, New Delhi, 2008.

REFERENCES:

1. Maurice J. Bach, “Design of the Unix Operating System”, Prentice Hall, New Delhi, 2007.
2. Meeta Gandhi, Tilak Shetty & Rajiv Shah, “The ‘C’ Odyssey Unix –The Open Boundless C”, 1st Edition, BPB Publications, 1992.

OBJECTIVE:

To provide knowledge about Open Source Technologies and to help in understanding the programming aspects of Personal Home Page (PHP), Perl, Python and MySQL.

UNIT I INTRODUCTION**9**

Introduction to Open Sources – Need of Open Sources – Advantages of Open Sources – Application of Open Source – Open Source Operating Systems : Linux – Introduction – General Overview – Kernel Mode and User Mode – Process – Advanced Concepts – Scheduling – Personalities – Cloning – Signals – Development with Linux .

UNIT II OPEN SOURCE DATABASE**9**

Introduction to MySQL – Setting up Account – Starting, Terminating and Writing SQL Programs – Record Selection Technology – Working with Strings – Date and Time – Sorting Query Results – Generating Summary – Working with Metadata – Using Sequences – My SQL and Web.

UNIT III OPEN SOURCE PROGRAMMING LANGUAGES**9**

Introduction to PHP – Programming in Web Environment – Variables – Constants – Data Type – Operators – Statements – Functions – Arrays – OOP – String Manipulation and Regular Expression – File Handling and Data Storage – PHP and SQL Database – PHP and LDAP – PHP Connectivity – Sending and Receiving E-mails – Debugging and Error Handling – Security – Templates .

UNIT IV PYTHON**9**

Introduction to Python – Syntax and Style – Python Objects – Numbers – Sequences – Strings – Lists and Tuples – Dictionaries – Conditionals and Loops – Files – Input and Output – Errors and Exceptions – Functions – Modules – Classes and OOP – Execution Environment .

UNIT V PERL**9**

Perl Backgrounder – Perl Overview – Perl Parsing Rules – Variables and Data – Statements and Control Structures – Subroutines, Packages and Modules – Working with Files – Data Manipulation.

Total No. of Periods: 45**TEXTBOOK:**

1. Remy card , Eric Dumas & Frank Mevel, “The Linux Kernel Book”, Wiley Publications, 2003. (Unit I) .
2. Steve Suchring, “ MySQL Bible”, John Wiley, 2002. (Unit II)
3. Rasmus Lerdorf & Levin Tatroe, “ Programming PHP ”, O’Reilly, 2002 (Unit III)
4. Wesley J.chun , “ Core Python Programming ”, Prentice Hall, 2001 (Unit IV)
5. Martin C.Brown , “ Perl : The Complete Reference” , 2nd Edition , Tata McGraw Hill , Indian Reprint 2009. (Unit V)

REFERENCES:

1. Steven Holzner, “PHP: The Complete Reference”, 2nd Edition, Tata MCGraw Hill, Indian Reprint 2009.
2. Vikram Vaswani, “ MYSQL: The complete Reference “, 2nd Edition, Tata MCGraw Hill, Indian Reprint 2009.

OBJECTIVE:

To provide knowledge about the importance of graphical and web user interface in screen designing.

UNIT I INTRODUCTION**7**

Introduction – Importance of User Interface – Definition – Importance of Good Design – Benefits of Good Design – History of Human – Computer Interface.

UNIT II GRAPHICAL AND WEB USER INTERFACE**10**

Graphical User Interface – Popularity of Graphics, Concept of Direct Manipulation, Graphical Systems and Characteristics – Web User Interface – Popularity and Characteristics – Principles of User Interface – Design Process – Human Interaction with Computers, Important Human Characteristics in Design, Human Considerations in Design, Human Interaction Speeds and Understanding the Business Function.

UNIT III SCREEN DESIGNING**10**

Human Considerations in Interface and Screen Design – Interface Design Goals, Screen Meaning and Purpose, Organizing Screen Elements, Ordering of Data and Content, Navigation and Flow, Visually Pleasing Composition, Focus and Emphasis, Presentation Information and Statistical Graphics – Technological Consideration in Interface Design.

UNIT IV MENUS AND NAVIGATION SCHEMES**9**

Structure of Menus – Functions –Content – Formatting – Web Site Navigation – Problems, Goals and Design – Kinds of Graphical Menus – Menu Bar, Pull–Down Menu, Cascading Menu, Pop–Up Menu, Tear–Off Menu, Iconic and Pie Menus.

UNIT V WINDOWS AND GRAPHICS**9**

Window Characteristics – Components of a Window – Meaningful Graphics, Icons and Images – Icons – Kinds, Characteristics, Creating Icon, Drawing Icon, Design Process, Screen Presentation – Multimedia –Graphics –Images, Pictures, Video and Animation.

Total No. of Periods: 45**TEXT BOOK:**

1. Wilbert O Galitz, “The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques”, 3rd Edition, Wiley DreamTech, 2007.

REFERENCES:

1. Alan Dix, Janet Finckay, Greg Ford & Russell Beaulieu, “Human –Computer Interaction”, Pearson Education, 3rd Edition, 2004.
2. Sharp, Rogers & Preece, “Interaction Design”, 2nd Edition, John Wiley, 2008.
3. John M. Caroll, “Human–Computer Interaction—In the New Millennium”, Pearson Education, 2007.
4. Soren Lauesen, “User Interface Design – A Software Engineering Perspective”, Addison–Wesley, 2005.

OBJECTIVE:

To provide practical experience in software development using open source tools like Perl, Python, PHP and MySQL.

EXERCISES

1. Program to Demonstrate String Functions using PHP.
2. Program to Demonstrate Session using PHP.
3. Program to Create a File and write the Data into it using PHP.
4. Application for Email Registration and Login using PHP and MySQL.
5. Program to check the given number is Prime or not using Python.
6. Program to perform the String Operation using Python.
7. Program to perform Functions in Lists using Python.
8. Program to copy content of one file to another file Using Exception Handling using Python.
9. Program to Detect the Web Browser using Perl.
10. Program to perform the String Operation using Perl.
11. Program to Simulate Simple Calculator using Perl .
12. Program to Perform read, write operations in Files using Perl.

OBJECTIVE:

Implement the network concepts in Unix Environment.

EXERCISES

1. Write a Shell program to do the following operations using File and Directory Permission by supplying File name as argument:
 - i. Display File and Directory Permissions.
 - ii. Modify File and Directory Permissions.
 - iii. Set new File Permissions.
 - iv. Identify the Owner and Group for any File or Directory.
2. Write a UNIX shell program that prints the Owner, File Type, Access Permissions, and Access times of Files supplied as parameters. If a file is a directory, the program should read the directory and print the information for all Files in the Directory.
3. Program using basic Network Commands.
4. Program using system calls: create, open, read, write, close, stat, fstat, lseek.
5. Program to implement Inter Process Communication using Pipes.
6. Program to perform Inter Process Communication using Message Queues.
7. Program to perform Inter Process Communication using Shared Memory.
8. Program to perform Synchronization using Semaphores.
9. Program using TCP Sockets (Client and Server).
10. Program using UDP Sockets (Client and Server).

OBJECTIVE:

- To impart communication ability to exhibit the individual's subject knowledge
- To edify the expectation of corporate for desirable communication adeptness
- To show the need for a comprehensive link language to share subject expertise

UNIT I FUNDAMENTALS OF COMMUNICATION**6**

Framing Questions –Question words, Verbal Questions, Tags, Giving Replies –Types of Sentences, Writing Instructions, Listening Comprehension –Listening and ear training

UNIT II ASSERTIVE COMMUNICATION**6**

Dialogue Writing, Telephonic Conversations, Role Play Activities, Dramatizing Situations Writing Recommendations, Reading Exercises –Reviewing Books, Articles, Essays and News Items.

UNIT III ENGLISH FOR COMPETITIVE EXAMS**6**

Verbal Reasoning, Analogy Questions, Current Affairs, Idioms and phrases Spotting the errors, Fixing the spelling, Jumbled sentences

UNIT IV PUBLIC SPEAKING**6**

Giving Seminars and Presentations, Nuances of Addressing a Gathering, Welcoming a Gathering, Proposing Vote of Thanks, Compeering

UNIT V REPORTING & LETTER WRITING**6**

Report Writing –Reporting Industrial Mishaps and Demi–Official Report, Joining Report, Letter Writing –Kinds of Letters –Formal & Semi Formal Letters –Enquiry Letters about Employment.

Total no. of periods: 30**REFERENCES:**

1. R.P. Bhatnagar & Rahul Bhargava, “English for Competitive Examinations “,Macmillian Publishers, India, 1989, ISBN: 9780333925591
2. A.V. Martinet & A.J. Thompson, “A Practical English Grammar “,Oxford University Press, 1986
3. K.Devadoss & P.Malathy, “Soft Skills and Placement Tests”, 2nd Edition, National Book Publishers, Chennai, 2012.

OBJECTIVE:

To learn the concepts and approaches that are important in effectively managing software projects and apply these concepts to real software project management.

UNIT I INTRODUCTION**9**

Software Project Definition – Need for Software Project Management – Software Projects versus Other Types of Projects – Activities Covered by Software Project Management – Categories of Software Projects – An Overview of Project Planning – Selection of an Appropriate Project Approach.

UNIT II PROJECT EVALUATION & EFFORT ESTIMATION**9**

Project Portfolio Management – Evaluation of Individual Projects – Cost–Benefit Evaluation – Risk Evaluation – Strategic Program Management – Software Effort Estimation – Basics – Effort Estimation Techniques – Top–Down and Bottom–Up Estimating Approaches – Function Point Analysis – COCOMO Models .

UNIT III ACTIVITY PLANNING AND RISK MANAGEMENT**9**

Activity Planning – Objectives – Project Schedules – Sequencing and Scheduling Activities – Network Planning Models – Formulation of a Network Model – Forward Pass – Backward Pass – Critical Path – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Categories of Risk – Framework for Dealing with Risk – Critical Chain Scheduling .

UNIT IV RESOURCE ALLOCATION, MONITORING AND CONTROL**9**

Resource Allocation –Nature of Resources –Identifying Resources –Scheduling Resources –Creating Critical Paths –Cost Schedules – Scheduling Sequence –Monitoring and Control – Creating Framework – Collecting the Data –Visualizing Progress –Cost Monitoring –Earned Value Analysis –Getting the Project Back to Target –Change Control –Software Configuration Management .

UNIT V MANAGING CONTRACTS, PEOPLE AND ORGANIZING TEAMS**9**

Managing Contracts – Types of Contracts – Stages in Contract Placement – Contract Management – Acceptance – Managing People – Understanding Behavior – Organizational Behavior – Selecting the Right Person for a Job – Instruction in the Best Methods – The Oldman–Hackman Job Characteristics Model – Working in Teams – Becoming a Team – Decision Making – Organization and Team Structures – Leadership – Case Studies.

Total No. of Periods: 45**TEXT BOOK:**

1. Bob Hughes, Mike Cotterell & Rajib Mall, “Software Project Management”, Tata McGraw Hill, 2012.

REFERENCES:

1. Pankaj Jalote, “Software Project Management in Practice”, Addison Wesley, 2002.
2. Robert.T.Futrell, Donald F.Shafer & Linda I.Shafer, “Quality Software Project Management”, Pearson Education, Asia, 2002.

OBJECTIVE:

To know about different purposes, models and applications of data mining and data warehousing.

UNIT I INTRODUCTION**8**

Data Mining – Kinds of Data Mined – Functionalities – Technologies Used – Applications Targeted – Major Issues in Data Mining – Getting to know the Data: Types of Data Sets and Attribute Values.

UNIT II DATA PREPROCESSING AND DATA WAREHOUSING**9**

Data Quality – Major Tasks in Data Preprocessing – Data Reduction – Data Transformation and Data Discretization – Data Cleaning and Data Integration – Data Warehousing and OLAP: Basic Components – Data Cube and OLAP – Design and Usage – Implementation – Data Generalization by Attribute Oriented Induction – Data Cube Technology.

UNIT III MINING FREQUENT PATTERNS, ASSOCIATION RULES AND CLASSIFICATIONS**11**

Basic Concepts – Frequent Item Sets Mining Methods – Pattern Evaluation Methods – Applications – Advanced Frequent Pattern Mining: Road Map – Mining Association Rules – Constraint based Pattern Mining – Classification: Basic Concepts – Decision Tree Induction – Bayes Classification Methods – Rule Based Classification Methods – Techniques to Improve Classification Accuracy – Bayesian Belief Networks – Classification by Neural Network.

UNIT IV CLUSTER ANALYSIS AND OUTLIER ANALYSIS**9**

Clusters Analysis: Basic Concepts – Major Clustering Approaches – Partitioning Methods – Hierarchical Methods – Density-Based Methods – Model Based Clustering – Other Clustering Methods. Outlier Analysis: Handling of Outliers – Outlier Detection .

UNIT V TRENDS AND RESEARCH FRONTIERS IN DATA MINING**8**

Mining Complex Types of Data – Applications – Data Mining System Products and Research Prototypes – Trends in Data Mining.

Total No. of Periods: 45**TEXT BOOKS:**

1. Jiawei Han & Micheline Kamber, "Data Mining: Concepts and Techniques", 3rd Edition, Morgan Kaufmann Publishers, 2011.

REFERENCES:

1. Alex Berson & Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGrawHill, 2008.
2. Usama M.Fayyad, Gregory Piatetsky , Shapiro Padhrai Smyth & Ramasamy Uthurusamy, "Advances In Knowledge Discovery and Data Mining", The M.I.T Press, 1996.
3. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc., 2nd Edition 2008.
4. Sean Kelly, "Data Warehousing in Action", John Wiley & Sons Inc., 2007.

OBJECTIVE:

To understand the basics of mobile computing ideas and practices.

UNIT I INTRODUCTION**9**

Medium Access Control: Motivation for Specialized MAC – SDMA – FDMA – TDMA – CDMA – Comparison of Access Mechanisms – Tele Communications : GSM – DECT – TETRA – UMTS – IMT – 200 – Satellite Systems: Basics – Routing – Localization – Handover – Broadcast Systems: Overview – Cyclic Repetition of Data – Digital Audio Broadcasting – Digital Video Broadcasting.

UNIT II WIRELESS NETWORKS**9**

Wireless LAN: Infrared vs Radio Transmission – Infrastructure Networks – Ad hoc Networks – IEEE 802.11 – HIPERLAN – Bluetooth – Wireless ATM: Working Group – Services – Reference Model – Functions – Radio Access Layer – Handover – Location Management – Addressing Mobile Quality of Service – Access Point Control Protocol.

UNIT III MOBILE NETWORK LAYER**9**

Mobile IP: Goals – Assumptions and Requirement – Entities – IP Packet Delivery – Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP – Ad hoc Networks.

UNIT IV MOBILE TRANSPORT LAYER**9**

Traditional TCP – Indirect TCP – Snooping TCP – Mobile TCP – Fast Retransmit/ Fast Recovery – Transmission/ Timeout Freezing – Selective Retransmission – Transaction Oriented TCP.

UNIT V WAP**9**

Architecture – Datagram Protocol – Transport Layer Security – Transaction Protocol – Session Protocol – Application Environment – Wireless Telephony Application.

Total No. of Periods: 45**TEXT BOOK:**

1. J.Schiller, “Mobile Communication”, Addison Wesley, 2003.

REFERENCES:

1. William C.Y.Lee, “Mobile Communication Design Fundamentals”, John Wiley, 1993.
2. William Stallings, “Wireless Communication and Networks”, Pearson Education, 2003.
3. Sandeep Singhal, “WAP–Wireless Application Protocol”, Pearson Education, 2003.

OBJECTIVE:

To understand the software life cycle phases (Project Management, Requirements Engineering, Software Design and Testing) and to get familiar with the usage of CASE tools and Unified Modeling Language (UML).

EXCERCISES

1. Preparation of SRS (in IEEE format) for any domain problem. (eg. Banking, Library, Healthcare etc).
2. Preparation of Requirements Management Plan and Software Project Management plan for the selected project.
3. Analyze the risk related to the project and prepare Risk Management Plan for the project.
4. Draw ER diagram, Data Flow Diagram, Sequence, Collaboration, Activity & State Transition diagrams for the project using appropriate tools.
5. Preparation of Test Plan and Develop Test Case Hierarchy.
6. Perform various types of testing using appropriate tools.
 - a. Unit Testing
 - b. Integration Testing
 - c. Validation Testing
 - d. Performance Testing
7. Generation of Test Cases and Test Documentation for the selected project domain.
8. Preparation of Software Configuration Management Plan.
9. Preparation of Time–Line Chart and project table using PERT or CPM project scheduling methods.
10. Creation of Gantt Charts and Critical Paths using Project Manangement Tools.

OBJECTIVE:

To apply and learn the data mining techniques on standard databases using any open source data mining tool.

EXCERCISES

1. Implement the algorithm to compute the shell fragments for the given base cuboid.
2. Implement the FP–Growth algorithm.
3. Implement the algorithm to generate a decision tree for the given data set.
4. Develop an application to extract association mining rules.
5. Develop an application for implementing one of the clustering techniques.
6. Develop an application for implementing Naïve Bayes classifier.
7. Implement Apriori approach.
8. Design a knowledge flow layout to load, apply attribute selection, and normalize the attributes and to store the results in a CSV saver using WEKA tool.
9. Create a decision tree and train the tree using the given dataset as the training data. Report the model obtained after training using WEKA tool.

OBJECTIVE:

- To offer adequate exposure to admirable communication and soft skills needed for the corporate.
- To enhance the exteriors of one's soft skills exhibited while presenting oneself both in written and spoken communication.
- To sensitize towards corporate culture.

UNIT I PREAMBLE TO CORPORATE COMMUNICATION**6**

Grammar and Usage – Building Blocks, Homonyms, Technical Jargon, Subject and Verb Agreement, Error Correction, Creative Writing –Short Stories, Presenting Controversial Ideas through debate.

UNIT II CROSS–CULTURAL COMMUNICATION**6**

American and British English –Familiarity & Discrepancies, Spelling, Pronunciation, Accent, Strong and Weak Forms, Speech Comprehension in Cross–Cultural Ambience

UNIT III ENGLISH FOR EMPLOYABILITY**6**

Picture Perception, Video Sensitizing, Communicative Courtesy –Interactions –Situational Conversations, Time Management, Stress Management Techniques

UNIT IV E–MAIL ETIQUETTE**6**

Glimpses of E–Mail Etiquette –Dos & Don'ts of E–mail Etiquette, Desirable Drafting of E–mails, Types of E–Mails –Personal E–Mails, Professional E–mails, Demi– Official E–Mails, Business Mails, Unknown Ad Mails

UNIT V INTERVIEW & GD TECHNIQUES**6**

Importance of body language –Gestures & Postures, Extempore, Facing the Interview Panel, Answering a Familiar Question, Addressing an unknown Concept, Psychometric Tests and Stress Interviews, Introduction to GD, Mock GD Practices

Total No. of Periods : 30**REFERENCES:**

1. K.Devadoss & P.Malathy, “Soft Skills and Placement Tests”, Edition, National Book Publishers, 2nd Chennai, 2012.
2. S. P. Dhanavel, “English and Soft skills” Orient Black Swan Publishers, Hyderabad, India, 2010, ISBN: 9788125039808
3. R.S. Aggarwal, “A Modern Approach to Verbal & Non–Verbal Reasoning”, S.Chand Publishers, India, 2012, ISBN : 8121905516

ELECTIVES

P13CA7E11

DISTRIBUTED COMPUTING

3 0 0 3

OBJECTIVE:

To introduce the concepts of distributed computing, Distributed Process Issues and their limitations.

UNIT I INTRODUCTION

9

Characterization of Distributed Systems – Examples – Focus on Resource Sharing – Challenges – System Models – Architectural and Fundamental Models – Networking and Internetworking – Types of Networks – Network Principles – Internet Protocols – Case Studies.

UNIT II PROCESSES AND DISTRIBUTED OBJECTS

9

Interprocess Communication – The API for the Internet Protocols – External Data Representation and Marshalling – Multicast Communication – Network Virtualization – Case Study – Remote Invocation – Request Reply Protocols – Remote Procedure Call – Remote Method Invocation – Case Study.

UNIT III OPERATING SYSTEM ISSUES –I

9

The OS Layer – Protection – Processes and Threads – Communication and Invocation – OS Architecture – Security – Overview – Cryptographic Algorithms – Digital Signatures – Cryptography Pragmatics – Case Studies – Distributed File Systems – File Service Architecture – Sun Network File System.

UNIT IV OPERATING SYSTEM ISSUES –II

9

Name Services – Domain Name System – Directory and Discovery Services – Global Name Service – X.500 Directory Service – Clocks, Events and Process States – Synchronizing Physical Clocks – Logical Time And Logical Clocks – Global States – Distributed Debugging – Distributed Mutual Exclusion – Elections – Consensus and Related Problems.

UNIT V CONCURRENCY CONTROL AND DISTRIBUTED TRANSACTIONS

9

Transactions – Nested Transactions – Locks – Optimistic Concurrency Control – Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions – Atomic Commit Protocols – Concurrency Control in Distributed Transactions – Distributed Deadlocks – Transaction Recovery – Overview of Distributed Multimedia Systems.

Total No. of Periods: 45

TEXT BOOK:

1. George Coulouris, Jean Dollimore, Tim Kindberg & Gordon Blair, “Distributed Systems Concepts and Design”, Pearson Education, 5th Edition, 2012.

REFERENCES:

1. Sape Mullender, “Distributed Systems”, Addison Wesley, 2nd Edition, 1993.
2. Albert Fleishman, “Distributed Systems– Software Design and Implementation”, Springer–Verlag, 1994.
3. M.L.Liu, “Distributed Computing Principles and Applications”, Pearson Education, 2004.
4. Andrew S Tanenbaum & Maartenvan Steen, “Distributed Systems –Principles and Paradigms”, Pearson Education, 2002.
5. Mugesh Singhal & Niranjana G Shivaratri, “Advanced Concepts in Operating Systems”, Tata McGraw Hill Edition, 2001.

OBJECTIVE:

To learn about the internals of UNIX Operating System.

UNIT I INTRODUCTION TO UNIX**9**

Unix Operating System – History – System Structure – Users Perspective – OS Services – Hardware – Architecture – System Concepts – Kernel Data structures – System Administration – Buffer Cache – Headers – Structure of the Buffer Pool – Scenarios – Reading and Writing Disk Blocks – Advantages and Disadvantages of the Buffer Cache.

UNIT II FILE SYSTEMS**9**

INODES – Structure of a Regular File – Directories – Conversion of a Path Name to an INODE – Super Block – INODE Assignment – Disk Blocks – System Calls for the File System.

UNIT III PROCESSES**9**

Process States and Transitions – Layout of System Memory – Context of a Process – Manipulation of the Process Address Space – Sleep – Process Control – Creation – Signals – Awaiting Process Termination – The Shell – System Boot and Init Process – Process Scheduling and Time – System Calls for Time – Clock.

UNIT IV MEMORY MANAGEMENT**9**

Swapping – Demand Paging – Driver Interfaces – Disk Drivers –Terminal Drivers – Streams.

UNIT V INTERPROCESS COMMUNICATION**9**

Process Tracing – System V IPC – Network Communications – Sockets – Problem of Multiprocessor Systems – Solution with Master and Slave Processors – Semaphores – Distributed Unix Systems – Satellite Processors – Newcastle Connection – Transparent Distributed File Systems – System Calls.

Total No. of Periods: 45**TEXT BOOK:**

1. Bach M.J, “The Design of the Unix Operating System”, Prentice Hall of India Learning Pvt. Ltd., 2011.

REFERENCES:

1. Goodheart B., Cox.J., “The Magic Garden Explained”, Prentice Hall India, 1994.
2. Leffler S.J., Mckusick M.K., Karels M.J & Quarterman J.S., “The Design and Implementation of the 4.3 BSD Unix Operating System”, Addison Wesley, 1998.

OBJECTIVE:

To know the essential components of network security and cryptography.

UNIT I SYMMETRIC CIPHERS**9**

Overview – Classical Encryption Techniques – Block Ciphers and the Data Encryption Standard – Introduction to Finite Fields – Advanced Encryption Standard – More on Symmetric Ciphers – Confidentiality using Symmetric Encryption.

UNIT II PUBLIC KEY ENCRYPTION AND HASH FUNCTIONS**9**

Introduction to Number Theory – Public Key Cryptography and RSA – Key Management – Diffie – Hellman Key Exchange – Elliptic Curve Cryptography – Message Authentication and Hash Functions – Hash and MAC Algorithms – Digital Signatures and Authentication Protocols.

UNIT III NETWORK SECURITY PRACTICE**9**

Authentication Applications – Kerberos – X.509 Authentication Service – Electronic Mail Security – Pretty Good Privacy – S/MIME – IP Security – Web Security.

UNIT IV SYSTEM SECURITY**9**

Intruders – Intrusion Detection – Password Management – Malicious Software – Viruses and Related Threats – Viruses Counter Measures – Distributed Denial of Service Attacks – Firewalls – Firewall Design Principles – Trusted Systems.

UNIT V WIRELESS SECURITY**9**

Introduction to Wireless LAN Security Standards – Technology Comparisons – Wireless LAN Security Factors – Issues in Wireless Security.

Total No. of Periods: 45**TEXTBOOK:**

1. William Stallings, “Cryptography and Network Security – Principles and Practices”, Pearson Education, 5th Edition, 2010.

REFERENCES:

1. Atul Kahate, “Cryptography and Network Security”, Tata McGraw Hill, 2009.
2. Stewart S. Miller, “Wi-Fi Security”, Tata McGraw Hill 2003.
3. Charles B. Pfleeger & Shari Lawrence Pfleeger, “Security in Computing”, 4th Edition, Pearson Education, 2007.

OBJECTIVE:

To know the advance concepts of remote procedural call, distributed memory, synchronization, process management and file systems.

UNIT I INTRODUCTION**9**

Distributed Computing System – Evolution – System Models – Popularity – Issues in Designing a Distributed Operating System (DOS) – Distributed Computing Environment – Message Passing – Introduction – Desirable Features of a Good Message Passing System – Issues in Inter Process Communication (IPC) by Message Passing – Synchronization – Buffering – Multi Datagram Messages – Encoding and Decoding of Message Data – Process Addressing – Failure Handling – Group Communication.

UNIT II REMOTE PROCEDURE CALL**9**

Remote Procedure Calls (RPC) – Introduction – The RPC Model – Transparency of RPC – Implementing RPC Mechanism – Stub Generation – RPC Messages – Marshaling Arguments and Results – Server Management –Parameter – Passing Semantics – Call Semantics – Communication Protocols for RPCs – Complicated RPCs – Client–Server Binding – Exception Handling – Security – Special Types of RPCs – RPC in Heterogeneous Environments – Lightweight RPC – Optimization.

UNIT III DISTRIBUTED SHARED MEMORY**9**

Distributed Shared Memory (DSM) – Introduction – Architecture of DSM Systems – Design and Implementation Issues of DSM – Granularity – Structure of Shared Memory Space – Consistency Models – Replacement Strategy – Thrashing – Heterogeneous DSM – Advantages of DSM.

UNIT IV SYNCHORNIZATION AND RESOURCE MANAGEMENT**9**

Synchronization – Introduction – Clock Synchronization – Event Ordering – Mutual Exclusion – Deadlock – Election Algorithms – Resource Management – Introduction – Desirable Features of a Good Global Scheduling Algorithm – Task Assignment Approach – Load-Balancing Approach.

UNIT V PROCESS MANAGEMENT AND DISTRIBUTED FILE SYSTEMS**9**

Process Management – Introduction – Process Migration – Threads. Distributed File Systems – Desirable Features of a Good Distributed File System – File Models – File-Accessing Models – File–Sharing Semantics – File-Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles – Case Study: Distributed Computing Environment (DCE) Distributed File Service.

Total No. of Periods: 45**TEXT BOOK:**

1. Pradeep K. Sinha ,”Distributed Operating Systems”, Prentice Hall of India , New Delhi, 2006.

REFERENCES:

1. Andrew S.Tanenbaum, “Distributed Operating Systems”, Pearson Education, New Delhi, 2008.
2. Mukesh Singhal & Niranjana G.Shivaratri, “Advanced Concepts in Operating Systems”, Tata McGraw Hill, New Delhi, 2001.

OBJECTIVE:

To familiarize with Document Type Definition and XML Schema languages, to format XML data to the desired format and to parse XML documents.

UNIT I INTRODUCTION 9

Role of XML – XML and the Web – XML Language Basics – Simple Object Access Protocol (SOAP) – Web Services – Revolutions of XML – Service Oriented Architecture (SOA).

UNIT II XML TECHNOLOGY 9

XML Technology: XML – Name Spaces – Structuring with Schemas and DTD – Presentation Techniques – Transformation – XML Infrastructure.

UNIT III SOAP 9

Overview of SOAP – HTTP – XML – RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns and Faults – SOAP with Attachments.

UNIT IV WEB SERVICES 9

Overview – Architecture – Key Technologies – UDDI – WSDL – ebXML (Electronic Business XML) – SOAP and Web Services in E-Com – Overview of .NET and J2EE.

UNIT V XML SECURITY 9

Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS (XML Key Management Service) Structure – Guidelines for Signing XML Documents – XML in Practice.

Total No. of Periods: 45

TEXT BOOK:

1. Frank. P. Coyle, “XML, Web Services and the Data Revolution”, Pearson Education, 2002.

REFERENCES:

1. Ramesh Nagappan, Robert Skoczylas & Rima Patel Sriganesh, “Developing Java Web Services”, Wiley Publishing Inc., 2004.
2. Sandeep Chatterjeen & James Webber, “Developing Enterprise Web Services”, Pearson Education, 2004.
3. Charles F. Goldfarb & Paul Prescod, “The XML Hand Book”, 3rd Edition, Pearson Education, 2001.
4. Ed Tittel, “XML for Dummies”, Wiley Publishing, 2002.

OBJECTIVE:

To introduce the principles and paradigm of Cloud Computing and discover the role of developing cloud services.

UNIT I UNDERSTANDING CLOUD COMPUTING 7

Cloud Computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Need for Cloud Computing – Advantages and Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

UNIT II DEVELOPING CLOUD SERVICES 10

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On Demand Computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2 – Google App Engine – IBM Clouds.

UNIT III USING CLOUD SERVICES 10

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Word Processing – Collaborating on Databases – Storing and Sharing Files.

UNIT IV OUTSIDE THE CLOUD 9

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 9

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

Total No. of Periods: 45

TEXT BOOK:

1. Michael Miller, “Cloud Computing”, Pearson Education, New Delhi, 2009.

REFERENCES:

1. Haley Beard, “Cloud Computing Best Practices for Managing and Measuring Processes for On-demand Computing”, Applications and Data Centers in the Cloud with SLAs, Emereo Pty Limited, July 2008.

OBJECTIVE:

To give a clear understanding on the implementation of various networking protocols present in the TCP/IP Protocol Suite.

UNIT I INTRODUCTION 10

Standards – Internet – OSI Model – TCP/IP Protocol suite – Addressing – Wired Local Area Networks – Wireless Local Area Networks – Connecting devices.

UNIT II INTERNET PROTOCOL 10

IP addressing Introduction – Classful Addressing – Classless Addressing – Special Address – NAT IP packets – Delivery – Forwarding – Structure of Router – IPv4 Introduction – Datagram – Fragmentation – Checksum – IP Package – Address Resolution Protocol (ARP) – Internet control Message Protocol (ICMP) – Internet Protocol Version 6 (IPV6) Addressing – IPV6 Protocol.

UNIT III TRANSPORT PROTOCOL 8

User Datagram Protocol (UDP) – UDP Applications – UDP Package – UDP design – Transmission Control Protocol (TCP) services – TCP Features – Segment – Connection – State Transition Diagram – Windows in TCP – Flow Control – Error control – Congestion control.

UNIT IV APPLICATION LAYER AND CLIENT SERVER MODEL 8

Client Server Paradigm – Dynamic Host Configuration Protocol(DHCP) – DHCP Operation – DHCP Configuration – Domain Name System (DNS) – Name Space – DNS in the Internet – Resolution – DNS Message – Types of Records – TELNET.

UNIT V APPLICATION PROTOCOLS 9

File Transfer Protocol (FTP) – Connections – Communication – World Wide Web and Hypertext Transfer Protocol (HTTP) – Electronic Mail – Simple Network Management Protocol (SNMP) – Management Components – Structure Management Information (SMI) – Management Information Base (MIB).

Total No. of Periods: 45

TEXT BOOK:

1. Behrouz A. Forouzan, “TCP/IP Protocol Suite”, 4th Edition, Tata McGraw Hill, 2010.

REFERENCES:

1. Douglas E. Comer & David L. Stevens, “Internetworking with TCP/IP –Volume I, II and III”, Prentice–Hall of India Pvt. Ltd., 5th Edition 2005.

OBJECTIVE:

To understand the concepts of intelligent agents, knowledge representation, planning and decision making.

UNIT I INTRODUCTION**9**

Definitions – Foundations – History – Intelligent Agents – Agents and Environments – Nature of Environments – Structure of Agents – Problem Solving – Problem Solving Agents – Searching for Solutions – Uninformed Search Strategies – Heuristic Search Strategy.

UNIT II KNOWLEDGE REPRESENTATION AND REASONING**9**

First Order Logic – Inference in First Order Logic – Propositional vs First Order Inference – Unification and Lifting – Forward Chaining – Backward Chaining – Resolution Strategies – Knowledge Representation.

UNIT III CLASSICAL PLANNING**9**

Definitions – State Space Search – Planning Graphs – Classical Planning Approaches – Time Schedule and Resources – Hierarchical Planning – Nondeterministic Domains – Multi Agent Planning.

UNIT IV UNCERTAIN KNOWLEDGE AND REASONING**9**

Acting under Uncertainty – Probability Notation – Inference Using Full Joint Distributions – Independence – Bayes Rule and Use – Representing Knowledge in an Uncertain Domain – Semantics of Bayesian Networks – Efficient Representation of Conditional Distributions – Exact Inference – Approximate Inference – Relational and First-order Probability Models.

UNIT V DECISION MAKING**9**

Making Simple Decisions – Beliefs and Desires – Utility Theory – Utility Function – Multi Attribute Utility Function – Decision Networks – The Value of Information – Decision Theoretic Expert Systems – Making Complex Decisions – Sequential Decision Problems – Value Iteration – Policy Iteration – Decisions with Multiple Agents – Mechanism Design.

Total No. of Periods: 45**TEXT BOOK:**

1. Stuart Russell & Peter Norvig, “Artificial Intelligence – A Modern Approach”, 3rd Edition, Prentice Hall, 2009.

REFERENCES:

1. Michael Wooldridge, “An Introduction to Multi Agent System”, John Wiley, 2009.
2. Patrick Henry Winston, “Artificial Intelligence”, 3rd Edition, Addison–Wesley, 1999.
3. Nils.J.Nilsson, “Principles of Artificial Intelligence”, Narosa Publishing House, 1992.
4. www.agentlands.com.
5. www.wareshare.com.
6. www.supershare.com.
7. www.Intelligentsystems.com.

OBJECTIVE:

To learn about the need for business intelligence and to discuss on business models and information flow. To gain knowledge about Data Enhancement and Knowledge Discovery.

UNIT I THE NEED FOR BUSINESS INTELLIGENCE 9

The Information Asset –Exploiting Information–Business Intelligence and Program Success– Business Intelligence –Actionable knowledge –The value of Business intelligence: The Information Asset and Data Valuation –Business Intelligence Applications– The Intelligence Dashboard.

UNIT II PLANNING FOR SUCCESS 9

Initiating a program –Business/Information Technology Partnership– Business Intelligence Success Factors– Team Building –Strategic versus Tactical Planning, The Business Intelligence Environment – The Business Intelligence Process – System Infrastructure – Information Access, Delivery and Analysis – Services– Management Issues.

UNIT III BUSINESS MODELS AND INFORMATION FLOW 9

The Business case– Information processing and Information Flow –Information flow model– Usage in Practice– Modeling Frameworks– Management Issues– Data Models, Data mart, Data warehouse, Online Analytical Processing, Metadata– Business Rules– Sources of Business Rules.

UNIT IV DATA PROFILING 9

Data Profiling Activities –Data Quality and Information Compliance – Data Cleansing – Business Rule – Based Information Compliance –Information Integration – ETL Extract, Transform, Load Enterprise Application Integration and Web Services– Parallelism and Granularity –Alternate Information Contexts– Psychographics and demographics, Geographic Data and Web Behavior Intelligence.

UNIT V DATA ENHANCEMENT AND KNOWLEDGE DISCOVERY 9

Types of Data Enhancement– Standardization– Enhancement Methodologies –Knowledge Discovery and Data Mining –Data Warehouse – Six Basic Task of Data Mining –Using Publicly Available Data– Data Resources – Semi Structured data –The Myth of Privacy.

Total No. of Periods: 45

TEXT BOOK:

1. David Loshin, “Business Intelligence”, The Savvy Manager’s Guide, Morgan Kaufmann Professionals, 2003.

REFERENCES:

1. Larissa T. Moss & Shaku Atre, “Business Intelligence Roadmap: The Complete Project Lifecycle for Decision Support Applications”, Addison Wesley, 2003.

OBJECTIVE:

To learn about the concepts of Software Agents and Mobile Agents.

UNIT I AGENT AND USER EXPERIENCE 9

Interacting with Agents – Agent From Direct Manipulation to Delegation – Interface Agent Metaphor with Character – Designing Agents – Direct Manipulation vs Agent Path to Predictable.

UNIT II AGENTS FOR LEARNING IN INTELLIGENT ASSISTANCE 9

Agents for Information Sharing and Coordination – Agents that Reduce Work Information Overhead – Agents without Programming Language – Life like Computer Character – Software Agents for Cooperative Learning – Architecture of Intelligent Agents.

UNIT III AGENT COMMUNICATION AND COLLABORATION 9

Overview of Agent Oriented Programming – Agent Communication Language – Agent Based Framework of Interoperability.

UNIT IV AGENT ARCHITECTURE 9

Agents for Information Gathering – Open Agent Architecture – Communicative Action for Artificial Agent.

UNIT V MOBILE AGENTS 9

Mobile Agent Paradigm – Mobile Agent Concepts – Mobile Agent Technology – Case Study: Tele Script, Agent Tel.

Total No. of Periods: 45

TEXT BOOK:

1. Jeffrey M. Bradshaw, "Software Agents", MIT Press, 2000. (Units I, II, III, IV)
2. William R. Cockayne & Michael Zyda, "Mobile Agents", Prentice Hall, 1998. (Unit V)

REFERENCES:

1. Stuart Jonathan Russel & Peter Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, 2nd Edition, 2002.
2. Joseph P. Bigus & Jennifer Bigus, "Constructing Intelligent agents with Java: A Programmer's Guide to Smarter Applications", Wiley, 1997.

OBJECTIVE:

To learn the basic concepts of Neural Networks, Genetic Algorithm and Fuzzy Logic and to get exposure to many real world control problems.

UNIT I INTRODUCTION**5**

Biological Basis for Neural Networks – Evolutionary Computation – Behavioral Motivations for Fuzzy Logic – Application Areas – Computational Intelligence Development.

UNIT II NEURAL NETWORKS**10**

Neural Network Theory – Components and Terminology – Topologies – Learning – Recall – Taxonomy – Preprocessing & Post Processing – Implementation of Neural Network – Back Propagation – Learning Vector Quantizer – Radial Basis Function Networks – Kohonen Self Organizing Maps.

UNIT III GENETIC ALGORITHM**10**

Evolutionary Computation Theory – Overview – Genetic Algorithm – Simple Example Problem – Programming – Strategies – Genetic Programming – Implementation of Genetic Algorithm and Particle Swarm Optimizer.

UNIT IV FUZZY SET THEORY**10**

Fuzzy System Theory – Fuzzy Sets and Fuzzy Logic – Approximate Reasoning – Issues – Fuzzy Systems Implementation.

UNIT V COMPUTATIONAL INTELLIGENCE**10**

Computational Intelligence Theory – Definitions – Relationships among Components of Intelligent Systems Implementations – Metrics.

Total No. of Periods: 45**TEXT BOOK:**

1. Russell C Eberhart & Yuhui Shi, “Computational Intelligence: Concepts to Implementations”, AP Professional, 2009.

REFERENCES:

1. S.N.Sivanandam & S.N.Deepa, “Principles of Soft Computing”, Wiley India (P) Ltd, 1st Edition, 2007.
2. Simon Haykin, “Neural Networks, A Comprehensive Foundation”, 2nd Edition, Addison Wesley Longman, 2001.
3. Timothy J. Ross, “Fuzzy Logic with Engineering Application”, Tata McGraw Hill, 1977.
4. Davis E.Goldberg, “Genetic Algorithms: Search, Optimization and Machine Learning”, Addison Wesley, N.Y., 1989.
5. S. Rajasekaran & G.A.V.Pai, “Neural Networks, Fuzzy Logic and Genetic Algorithms”, PHI, 2003.

OBJECTIVE:

To familiarize students with algorithms used to implement relational DBMS and advance techniques currently in use for implementing and maintaining large databases.

UNIT I INTRODUCTION**9**

Databases and Database Users – Database System Concepts and Architecture – Database Administration.

UNIT II DATABASE DESIGN THEORY AND METHODOLOGY**9**

Functional Dependencies and Normalization for Relational Databases – Relational Database Design Algorithms – Practical Database Design Methodology and Use of UML Diagrams.

UNIT III DATABASE DESIGN ISSUES**9**

Algorithms for Query Processing and Optimization – Physical Database Design and Tuning – Database Security.

UNIT IV ENHANCED DATA MODELS**9**

Active Database Concepts and Triggers – Temporal Databases – Deductive Databases – Distributed Databases: Concepts, Database Design and Types.

UNIT V EMERGING TECHNOLOGIES AND APPLICATIONS**9**

Web Database Programming using PHP – Overview of Data Mining Technology – Data Warehousing: Introduction and Characteristics – Mobile Databases – Multimedia Databases – Geographic Information Systems – Genome Data Management.

Total No. of Periods: 45**TEXT BOOK:**

1. R. Elmasri & S.B. Navathe, “Fundamentals of Database Systems”, Pearson Education, 5th Edition 2008.

REFERENCES:

1. Gary W. Hanson & James V. Hanson, “Database Management and Design”, PHI Learning Pvt. Ltd., 3rd Edition, 2010.
2. Han & Kamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers, 2nd Edition, 2006.
3. Abraham Silberschatz, Henry F.Korth & S.Sudarshan,”Database System Concepts”, 6th Edition, McGraw Hill International Edition, 2011.

OBJECTIVE:

To identify the impact of e-commerce and know about the technologies used to develop and deliver e-commerce applications

UNIT I INTRODUCTION**9**

Introduction to Electronic Commerce: Electronic Commerce: The Second Wave –Business Models, Revenue Models and Business Processes –Economic Forces and Electronic Commerce –Identifying Electronic Commerce Opportunities –International Nature of Electronic Commerce. The Environment of Electronic Commerce: Legal, Ethical, and Tax Issues: The Legal Environment of Electronic Commerce –Use and Protection of Intellectual property in Online Business –Online Crime, Terrorism and Welfare –Ethical Issues –Taxation and Electronic Commerce.

UNIT II COMMERCE ON WEB**9**

Selling on the web: Revenue Models – Revenue Models in Transition – Revenue Strategy Issues – Creating an Effective Web Presence – Web Site Usability –Connecting with Customers. Marketing on the Web: Web Marketing Strategies – Communicating with Different Market Segments –Beyond Market Segmentation: Customer Behavior and Relationship Intensity – Advertising on the Web – E-Mail Marketing – Technology Enabled Customer Relationship Management – Creating and Maintaining Brands on the Web – Search Engine Positioning and Domain Names.

UNIT III BUSINESS STRATEGIES**9**

Business-to-Business Online Strategies: Purchasing, Logistics and Support Activities – Electronic Data Interchange – Supply Chain Management using Internet Technologies – Electronic Market Places and Portals. Online Auctions, Virtual Communities and Web portals: Auction Overview – Online Auctions and Related Businesses –Virtual Communities: Web Portals and Social Networks.

UNIT IV SECURITY**9**

Electronic Commerce Security: Online Security Issues Overview –Security for Client Computers – Communication Channel Security – Security for Server Computers – Organizations that Promote Computer Security. Web Server Hardware and Software: Web Server Basics – Software for Web Servers – Electronic Mail – Web Site and Internet Utility Programs – Web Server Hardware.

UNIT V PAYMENT SYSTEMS**9**

Payment Systems for Electronic Commerce: Online Payment Basics –Payment Cards – Electronic Cash – Electronic Wallets – Stored-Value Cards – Internet Technologies and the Banking Industry. Case Studies: E-Commerce Web Sites.

Total No. of Periods: 45**TEXT BOOK:**

1. Gary P.Schneider, “Electronic Commerce”, 8th Edition (India Edition), Cengage Learning India Private Limited, New Delhi, 2009.

REFERENCES:

1. Kenneth C.Laudon, Carol Guercio Traver , “E-Commerce –Business, Technology, Society”, Pearson Education, 2008.
2. Dave Chaffey, “E-Business and E-Commerce Management”, 4th Edition, Pearson Education, 2011.

OBJECTIVE:

The objective is to provide the candidate with an exposure to theories and models relevant to the study of information systems.

UNIT I SYSTEM CONCEPTS**7**

Definition –Computer Based User Machine System – Integrated System – Need for a Database – Utilization of Models – Evolution –Subsystems –Organizational Subsystems – Activities Subsystems.

UNIT II ORGANIZATIONAL STRUCTURE**9**

Basic Model –Hierarchical –Specialization –Formalization – Centralization – Modifications of Basic Organizational Structure – Project Organization – Lateral Relations – Matrix Organization – Organizational Culture and Power Organizational Change.

UNIT III STRUCTURE OF MIS**10**

Operating Elements – Physical Components –Processing Functions –Outputs –MIS support for Decision Making – Structured Programmable Decisions – Unstructured Non–Programmable Decisions – MIS Structure Based on Management Activity and Organizational Functions – Synthesis of MIS Structure.

UNIT IV SYSTEM SUPPORT**10**

Data Representation –Communication Network – Distributed Systems – Logical Data Concepts – Physical Storage Devices – File Organizations – Database Organization – Transaction Processing.

UNIT V DEVELOPMENT AND MANAGEMENT**9**

A Contingency Approach to Choosing an Application – Developing Strategy – Lifecycle Definition Stage – Lifecycle Development Stage – Lifecycle Installation and Operation Stage – Project Management .

Total No. of Periods: 45**TEXT BOOK :**

1. Gordon B. Davis & Margrethe H. Olson, “Management Information Systems: Conceptual Foundations, Structure and development” ,2nd Edition , Tata McGraw Hill, 2000.

REFERENCES :

- 1.E.Wainright Martin, Carol V. Brown, Danial W. DeHayes, Jeffrey A. Hoffer & William C. Perkins,“Managing Information Technology”, 7th Edition, Prentice Hall, International Edition 2011.
2. Harold Koontz & Heinz Weihrich, “Essentials of Management”, 8th Edition, Tata McGraw Hill, 2009.

OBJECTIVE:

To ensure human resources are employed cost-effectively and Make effective use of workforce potential.

UNIT I LEADERSHIP**9**

Technical Leadership – Leader's Goal, Conviction, Vision – Transformational and Transactional Leadership – Leader's Vision – Professionalism : Importance and Elements – Managing Awareness – Performance – Manager's Role in Professionalism –Respect for individual.

UNIT II MANAGING TECHNICAL AND PROFESSIONAL PEOPLE**9**

Goals of Engineers and Scientists – Work Assignment –Hierarchy of Needs – Need for Influence – Professional Career and Goals – Age and Creativity – Performance – Motivation – Employee Partnership – Career Risks – Technical Competence – Professional Discipline – Manager's Role in Professional Discipline – Guidelines.

UNIT III IDENTIFICATION AND DEVELOPMENT OF TALENTED PEOPLE**9**

Talented Professionals – Importance – Characterization – Identification –Assessment and Recognizing Talent – Developing Technical Talent – Professional Development – Development Needs – Career Counseling – Developing Managerial Talent –Development Process –Alternating Assignments – Temporary Assignments – Management Development Reviews –Supporting Management Development.

UNIT IV INNOVATION**9**

The Importance of Innovation – Risk of Failure – Nature of Creativity – Imagination – Managing Innovative Teams – Needs of Creative Teams – Team Dynamics – A Software Development Example – Manager's Responsibility – Team's Personal Needs – Political versus Technical Solutions – Team Synergism –Crystallizing the Team –Communication –Managing Team Conflict.

UNIT V TEAM ENVIRONMENT AND RECOGNITION**9**

Team Structure – Innovative Team Environment –Award Programs – Recognition Programs – An Example Award Plan – Industry Award Plans – Award Guidelines – Incentive Plans – A Caution on Recognition Programs –Case Studies.

Total No. of Periods: 45**TEXT BOOK:**

1. Watts S. Humphrey, “Managing Technical People: Innovation, Teamwork, and the Software Process”, Dorling Kindersley Ltd., 2009.

REFERENCES:

1. Biswajeet Pattanayak, “Human Resource Management”, PHI Learning Pvt. Ltd., 3rd Edition, 2010.
2. K.Asathappa, “Human Resource and Personnel Management Text and Cases”, Tata McGraw Hill , 6th Edition, 2011.

OBJECTIVE:

The objective of this course is to introduce to the students on the basic concepts on Supply Chain Management, ERP and the importance of information in business and advantage of ERP. It also trains the students in building a business model for ERP implementation. This course gives exposure to the commercial ERP packages. It also exposes the students to the various architectural methods in building an ERP packages

UNIT I INTRODUCTION TO ERP**9**

Integrated Management Information Seamless Integration –Supply Chain Management –Integrated Data Model –Benefits of ERP –Business Engineering and ERP –Definition of Business Engineering –Principle of Business Engineering –Business Engineering with Information Technology.

UNIT II BUSINESS MODELLING FOR ERP**9**

Building the Business Model –ERP Implementation – An Overview – Role of Consultant, Vendors and Users – Customization –Precautions –ERP Post Implementation Options – ERP Implementation Technology – Guidelines for ERP Implementation.

UNIT III ERP AND THE COMPETITIVE ADVANTAGE**9**

ERP domain Manufacturing (MFG)/Pro –Industrial and Financial Systems (IFS)/Avalon –Industrial and Financial Systems – Baan IV Systems, Applications and Products (SAP) – Market Dynamics and Dynamic Strategy.

UNIT IV COMMERCIAL ERP PACKAGE**9**

Description – Multi–Client/Server Solution – Open Technology – User Interface – Application Integration.

UNIT V ARCHITECTURE**9**

Basic Architectural Concepts – The System Control Interfaces – Services – Presentation Interface – Database Interface.

Total No. of Periods: 45**TEXT BOOK:**

1. Vinod Kumar Garg & N.K.Venkita Krishnan, “Enterprise Resource Planning –Concepts and Practice”, 2004, PHI Learning Pvt. Ltd.

REFERENCES:

1. Jose Antonio Fernandez, “The SAP R/3 Handbook”, TMH, 2005.

OBJECTIVE:

To make students understand the way organizations gather, manage and use the knowledge they acquire.

UNIT I INTRODUCTION**9**

Knowledge Management – Knowledge Organization –Need for Knowledge Management –Key Challenges –Implications for Knowledge Management – Challenges in Building Knowledge Management Systems – Types of Knowledge –Data, Information and Knowledge – Expert Knowledge –Knowledge Management Life Cycle – Conventional Versus Knowledge Management Life Cycle.

UNIT II KNOWLEDGE CREATION AND CAPTURE**9**

Knowledge Creation – Nonaka’s Model – Knowledge Architecture – Knowledge Capture – Evaluating the Expert – Interview –Guidelines – Other Knowledge Capture Techniques.

UNIT III KNOWLEDGE CODIFICATION AND SHARING**9**

Knowledge Codification –Need –Modes of Knowledge Conversion –Codifying Tacit Knowledge – Codification Tools and Procedures – Knowledge Transfer – Methods – Roles of Internet in Knowledge Sharing.

UNIT IV KNOWLEDGE MANAGEMENT TOOLS AND PORTALS**9**

Learning Models –Neural Network, Association Rules, Classification Trees – Data Mining and Business Intelligence – Data Management – Knowledge Management Portals – Basics –The Business Challenge – Knowledge Portal Technologies.

UNIT V ISSUES IN KM**9**

Ethical and Legal Issues – Knowledge Owners – Legal Issues – The Ethics Factor –Managing Knowledge Workers –Business Roles in Knowledge Management – Knowledge Worker Skills – Chief Knowledge Officer – Managing Knowledge Projects.

Total No. of Periods: 45**TEXT BOOK:**

1. Elias M.Awad & Hassan Ghaziri , “Knowledge Management”, Pearson Education , 2009.

REFERENCES:

- 1.Irma Becerra Fernandez , Avelino Gonzalez & Rajiv Sabherwal , “Knowledge Management: Challenges, Solutions and Technologies”, Pearson Education, 2009.
- 2.Shelda Debowski, “Knowledge Management”, Wiley India, 2007.

OBJECTIVE:

To introduce the quality management process and its activities. Also explain the standards and metrics of software.

UNIT I INTRODUCTION**9**

Quality Control & Assurance–Software Process Assessment Overview – Assessment Phases – Assessment Principles – Assessment Conduct – Implementation Consideration – Quality Management – Quality Assurance Plan – Considerations –Verification and Validation.

UNIT II CONFIGURATION MANAGEMENT**9**

Need for Configuration Management – Software Product Nomenclature – Configuration Management Functions – Baselines – Responsibilities – Need for Automated Tools – Plan –SCM Support Functions – The Requirement Phase Design Control – The Implementation Phase – Test Phase – SCM Tools – Configuration Accounting and Audit–Release Management Through Source Control.

UNIT III SOFTWARE STANDARDS AND INSPECTION**9**

Definitions – Reason for Software Standards – Benefits – Establishing Standards – Guidelines – Types of Reviews – Inspection of Objectives – Basic Inspection Principles – The Conduct of Inspection – Inspection Training.

UNIT IV TESTING AND MANAGING SOFTWARE QUALITY**9**

Testing: Principles – Types – Planning – Development – Execution and Reporting –Tools & Techniques – Methods – Real Time Testing – Quality Management Paradigm – Quality Motivation –Measurement Criteria – Establishing a Software Quality Program – Estimating Software Quality.

UNIT V DEFECT PREVENTION**9**

Principles of Software Defect Prevention – Process Changes for Defect Prevention – Defect Prevention Considerations – Management Role – Framework for Software Process Change – Managing Resistance to Software Process Change – Case studies.

Total No. of Periods: 45**TEXT BOOK:**

1. Watts S. Humphrey, “Managing the Software Process”, Addison Wesley, 1999.

REFERENCES:

1. Tsum S.Chow, “Software Quality Assurance a Practical Approach”, IEEE Computer Society press, 1985.
2. Richard E. Fairley, “Software Engineering – A Practitioner’s Approach”, Tata McGraw Hill, 2005.

OBJECTIVE:

This course will look at professional techniques for assessing and modeling the reliability of software systems.

UNIT I INTRODUCTION TO SOFTWARE RELIABILITY 7

Basic Concepts –Failure and Faults –Environment –Availability –Modeling –Uses.

UNIT II SOFTWARE RELIABILITY MODELING 12

Concepts –General Model Characteristic –Historical Development of Models –Model Classification Scheme –Markovian Models –General Concepts –General Poisson Type Models –Binomial Type Models –Poisson Type Models –Fault Reduction Factor for Poisson Type Models.

UNIT III COMPARISON OF SOFTWARE RELIABILITY MODELS 10

Comparison Criteria –Failure Data –Comparison of Predictive Validity of Model Groups –Recommended Models –Comparison of Time Domains –Calendar Time Modeling –Limiting Resource Concept –Resource Usage model –Resource Utilization –Calendar Time Estimation and Confidence Intervals.

UNIT IV FUNDAMENTALS OF MEASUREMENT 8

Measurements in Software Engineering –Scope of Software Metrics –Measurements Theory –Goal based Framework –Software Measurement Validation.

UNIT V PRODUCT METRICS 8

Measurement of Internet Product Attributes –Size and Structure –External Product Attributes –Measurement of Quality –Reliability Growth Model –Model Evaluation.

Total No. of Periods: 45

REFERENCES:

1. John D. Musa., Anthony Iannino & Kazuhira Okumoto, “Software Reliability –Measurement, Prediction, Application, Series in Software Engineering and Technology”, Tata McGraw Hill, 1990.
2. John D. Musa, “Software Reliability Engineering”, Tata McGraw Hill, 2005.
3. Norman E. Fenton & Shari Lawrence Pfleeger, "Software Metrics", 2nd Edition, International Student Edition, 2003.

OBJECTIVE:

To understand the basic concepts, types and the way in which effective and efficient testing can be performed

UNIT I INTRODUCTION**9**

Testing as an Organization –Bugs – Software Bugs – Reasons for Bugs – Cost of Bugs – Responsibilities of Software Tester –Software Development Process: Product Component – Life Cycle Models – Testing Realities.

UNIT II TESTING FUNDAMENTALS**9**

Examining the Specification – Testing the Software with Blinders On – Examining the Code – Testing the Software with X Ray Glasses.

UNIT III TESTING TYPES**9**

Configuration Testing: Overview – Approaches to the Task – Compatibility Testing: Overview – Platform and Application Version – Standards and Guidelines – Foreign Language Testing: Translation Issues – Localization Issues – Configuration and Compatibility Issues – Usability Testing – **Web Site Testing:** Black Box Testing – Gray Box Testing – White Box Testing – Configuration and Compatibility Testing – Usability Testing– Funtional(Regression) & Non-Functional(Performance) –Agile.

UNIT IV AUTOMATED TESTING AND TEST TOOLS**9**

Benefits – Test Tools – Software Automation – Random Testing – Bug Bashes and Beta Testing: Test Sharing – Beta Testing – Outsourcing Your Testing – Testing for Software Security.

Test Documentation: Planning your Test Effort: Goal of Planning – Planning Topics – Writing and Tacking Test Cases: Goal – Test Case Planning– Design – Cases – Procedures – Test Case Organization and Tracking

UNIT V REPORTING THE FINDINGS**9**

Getting Bugs Fixed – Isolating and Reproducing Bugs – Bug Life Cycle – Bug Tracking System – Measuring the Success –KPI's & SLA's

Software Quality Assurance: Testing Quality Assurance in the Workplace – Software Testing – Quality Assurance – Test Management and Organizational Structures – Capability Maturity Model (CMM) – RCA - Defect Density.

A Case Study on Test Life Cycle**Total No. of Periods: 45****TEXT BOOK:**

1. Ron Patton, "Software Testing", Pearson Education, 2nd Edition, 2009.

REFERENCES:

1. Elfriede Dustin, "Effective Software Testing", Pearson Education, 2007.
2. Boris Beizer, "Software Testing Techniques", Dream Tech Press, 2006.
3. William Perry, "Effective Methods for Software Testing", John-Wiley & Sons Inc, 2006.

OBJECTIVE:

The objective of this course is to introduce to the students the fundamentals of digital image processing, give an overview about the available techniques in image enhancement and restoration, provide an insight on the basic image compression and segmentation algorithms and about the various image representation and description schemes, object recognition methods.

UNIT I DIGITAL IMAGE FUNDAMENTALS 9

Digital Image Processing – Introduction – Elements of Visual Perception– Image Sensing and Acquisition – Image Sampling and Quantization – Basic Relationships between Pixels.

UNIT II IMAGE ENHANCEMENT AND RESTORATION 9

Histogram Processing – Spatial Filtering –Smoothing Spatial Filters –Sharpening Spatial Filters – Frequency Domain Filtering– Smoothing Frequency Domain Filters –Sharpening Frequency Domain Filters – Image Restoration and Degradation Process –Noise models.

UNIT III IMAGE COMPRESSION AND SEGMENTATION 9

Compression Models – Elements of Information Theory – Error Free Compression – Image Segmentation –Detection of Discontinuities – Edge Linking and Boundary Detection –Thresholding –Region based Segmentation – Morphology.

UNIT IV REPRESENTATION AND DESCRIPTION 9

Representation Schemes – Boundary Descriptors – Regional Descriptors – Relational Descriptors .

UNIT V OBJECT RECOGNITION 9

Patterns and Pattern Classes –Recognition Based on Decision – Theoretic Methods – Structural Methods.

Case study –Wavelet Transforms in One Dimension and Two Dimensions.

Total No. of Periods: 45

TEXTBOOK:

1. Rafael C. Gonzalez & Richard E.Woods, “Digital Image Processing”, Prentice Hall, 3rd Edition, 2008.

REFERENCES:

1. Anil Jain.K, “Fundamentals of Digital Image Processing”, Prentice Hall of India, 1989.
2. Maher A. Sid Ahmed, “Image Processing”, Tata McGraw Hill, New York, 1995.

OBJECTIVES:

To introduce and study the architecture and programming of 8085 microprocessor, interfacing of peripheral devices with 8085 microprocessor, the architecture and programming of 8086 microprocessor, programming and interfacing of 8051 micro controller.

UNIT I INTRODUCTION TO 8085 MICROPROCESSOR 9

Evolution of the Microprocessor – INTEL 8085 –Introduction – Register Architecture – Memory Addressing : 8085 Addressing Modes – 8085 Instruction Set –Timing Methods 8085 Pins and Signals – 8085 Instruction Timing and Execution.

UNIT II INTRODUCTION TO 8086 MICROPROCESSOR 9

Introduction – 8086 Architecture – 8086 Addressing Modes – 8086 Instruction Set –Data Movement Instructions Arithmetic and Logic Instructions – Program Control Instructions.

UNIT III 8086 MICROPROCESSOR INTERFACING 9

System Design Using 8086 – Basic System concepts – Bus Cycle – Address and data bus concepts – Interfacing with memories –Random Access Memory (RAM) –Erasable Programmable Memory (EPROM) –Dynamic Random Access Memory (DRAM) – Programmed I/O.

UNIT IV 8086 SYSTEM AND PENTIUM PROCESSOR 9

Interrupts and interrupt service routines – Basic 8086/8088 Configurations: Minimum Mode and Maximum Mode – 8086/8088 based Multiprocessing Systems: Coprocessor Configurations, Closely Coupled Configurations and Loosely Coupled Configuration. Architecture of Pentium processor.

UNIT V PERIPHERAL INTERFACING 9

8255A Programmable Peripheral Interface – IC 8251A Serial Communication Interface –8253 Programmable Interval Timer IC – IC 8279 Programmable Keyboard /Display Interface –8259A Programmable Interrupt Controller.

Total No. of Periods: 45

TEXT BOOK:

1. Mohamed Rafiquzzaman “Introduction to Microprocessors and Microcomputer– Based System Design” 2nd edition, CRC Press, 1995.
2. Yu–cheng Liu, Glenn A.Gibson, “Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design”, PHI 2nd Edition, 2004.

REFERENCES:

1. Douglas V.Hall, “Microprocessors and Interfacing: Programming and Hardware”, Tata McGraw Hill, 3rd Edition, 1999.
3. Barry B.Brey, “The INTEL Microprocessors 8086/8088, 80186, 80286, 80386 and 80486 Architecture, Programming and Interfacing,” Prentice Hall of India, 2001.

On completion of the course, the students are expected

- to solve algebraic, transcendental and system of linear equations by using various techniques.
- to understand the concepts of interpolation with equal and unequal intervals and difference operators.
- to understand the concepts of numerical differentiation and numerical integral by various methods.
- to solve the ordinary differential equation with initial condition by numerical techniques.

UNIT I SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS 9

Linear interpolation methods (method of false position) – Newton’s method – iteration method – Solution of linear system by Gaussian elimination and Gauss-Jordon methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods - Inverse of matrix by Gauss-Jordan method - Eigen value of a matrix by power method.

UNIT II INTERPOLATION 9

Forming the difference table, operators E and Δ ; relationship between the operators. Newton’s forward and backward difference formulae – central difference formula ; Gauss forward and backward formula ; Equidistant arguments with one or two missing entries.

UNIT III INTERPOLATION WITH UNEQUAL INTERVALS 9

Divided difference table; Newton’s divided difference formula. Lagrange’s formula, inverse Interpolation – simple problems

UNIT IV NUMERICAL DIFFERENTIATION AND INTEGRATION 9

Numerical differentiation: Derivatives by using Newton’s forward , backward and divided differences – Numerical integration - trapezoidal and Simpson’s 1/3 and 3/8 rules – Weddle’s rule.

UNIT V INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 9

Single step methods: Taylor series method – Euler and improved Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne’s and Adam’s predictor and corrector methods.

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Total No. of Periods: 60

TEXT BOOK:

1. M.K.Venataraman, “Numerical Methods in Science and Engineering”, The National Publishing Company. May 2003.

REFERENCES:

1. Gerald, C.F, & Wheatley, P.O, “Applied Numerical Analysis”, 6th Edition, Pearson Education Asia, New Delhi, 2002.
2. Sastry, S.S, “Introductory Methods of Numerical Analysis”, 3rd Edition, Prentice – Hall of India Pvt Ltd, New Delhi, 2003.

