

M. TECH- COMPUTER SCIENCE

To provide the students the theoretical foundations of computer science and also to provide the students the knowledge of working of computer systems. To provide scope for specialization in the areas of computer science, such as Artificial intelligence, Software systems and Hardware. The students learn a variety of programming languages, operating environments, software packages, and development tools. Some software laboratory hours are provided for implementing and solving the problems given in some of the regular courses.

Subject Code	Subject	Credits	Subject Code	Subject	Credits
SEMESTER I			SEMESTER III		
MTC-01	Discrete Structure	5	MTC-10	Multimedia & Computer Graphics	5
MTC-02	Design & Analysis of Algorithm	5	MTC-11	Data Communication & Networking	5
MTC-03	Computer Network	5	MTC-12	Artificial Neural Networks	5
MTC-04	Operating Systems	5	MTC-13	System Modeling & Simulation	5
MTC-05	Database Management System	5		Elective-II	5
MTC-P1	DBMS Lab	5	MTC-P5	Design & Analysis of Algorithm Lab	5
MTC-P2	Operating System Lab	5	MTC-P6	Data Communication & Networking Lab	5
SEMESTER II			SEMESTER IV		
MTC-06	Advanced Mathematics	5	MTC-14	ASP.Net & C Sharp	5
MTC-07	Mobile Computing	5	MTC-15	Network Security	5
MTC-08	Advanced Computer Architecture	5	MTC-16	Advanced Microprocessors	5
MTC-09	Web Technology	5	MTC-17	Project	9
	Elective-I	5			
MTC-P3	C++ and DS Lab	5			
MTC-P4	Web Technology Lab	5			
				Grand Total	128

Elective-I

MTC-E1: Pattern Recognition & Image Processing

MTC-E2: Neural Networks

MTC-E3: Digital Image Processing

Elective-II

MTC-E4: Data Mining & Warehousing

ETC-E5: Software Testing

ETC-E6: Software Project Management

SUBJECT CODE: MTC-01

SUBJECT: DISTRETE STRUCTURE

BLOCK 1: MATHEMATIC LOGIC

Unit 1: Statements & Notations

Unit 2: Well Formed Formulas

Unit 3: Truth Tables & Tautology

Unit 4: Equivalence Implication & Normal Forms

BLOCK 2 : PREDICATES

Unit 1: Predicative Logic, Free& Bound Variables

Unit 2: Rules for Inference

Unit 3: Proof of Contradiction

Unit 4: Automatic Theorem Proving

BLOCK 3: SET THEORY

Unit 1: Property of Binary Relations

Unit 2: Compatibility & Partial Ordering Relations

Unit 3: Inverse Function Comports Of Function

Unit 4: Pigeon Hole Principles & Its Applications

BLOCK 4: ALGEBRAIC STRUCTURE

Unit 1: Algebraic System Examples & General Properties

Unit 2: Semi Groups & Monads

Unit 3: Groups & Sub Groups Homomorphism

Unit 4: Isomorphism

BLOCK 5: GRAPH THEORY & APPLICATIONS

Unit 1: Elementary Combinatorics

Unit 2: Recurrence Relations

Unit 3: Graph Theory

Unit 4: Graph Theory & Applications

Reference Books:-

1. Discrete and Combinatorial Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
2. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH
3. Discrete Mathematics for Computer Scientists & Mathematicians Prentice Hall, 1986 J.L. Mott, A. Kandel, T.P. Baker.
4. Discrete Mathematical Structures, Bernard Kolman, Roberty C. Busby, Sharn Cutter Ross, Pearson Education/PHI.
5. Discrete Mathematics for Computer science, Garry Haggard and others, Thomson
6. Discrete Mathematical Structures, Mallik and Sen, Thomson
7. Mathematical Foundations of computer science Dr D.S.Chandrasekharaiaha Prism Books Pvt Ltd.
8. Discrete Mathematics, Lovasz, Springer.
9. Discrete and Combinatorial Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi. Pearson Education
10. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH
11. Discrete Mathematics for Computer Scientists & Mathematicians Prentice Hall, 1986 J.L. Mott, A. Kandel, T.P. Baker
- 12.

SUBJECT CODE: MTC-02

SUBJECT: DESIGN & ANALYSIS OF ALGORITHM

BLOCK 1: OOPS CONCEPT

- Unit 1: Overview Of OOP Principles: Encapsulation, Inheritance, And Polymorphism, Object, Classes, Dynamic Binding
- Unit 2: Review of C++-Classes and Objects, Class Members, Access Control, Class Scope, Constructors and Destructors, Dynamic Memory Allocation and Deal Location (New and Delete),
- Unit 3: Polymorphism-Function Overloading, Operator Overloading, Generic Programming- Function and Class Templates, Inheritance, Run Time Polymorphism Using Virtual Functions, Abstract Classes.
- Unit 4: File I/O and Exception Handling. Formatted I/O with IOS Class Functions And Manipulators – Creating Own Manipulator – Overloading << And >> - File I/O – Name Spaces – Conversion Functions – Array based I/O – Standard Template Library (STL).

BLOCK 2: DATA STRUCTURES

- Unit 1: Algorithm Analysis And Review Of Data Structures: Algorithms, Pseudopodia for Expressing Algorithms, Performance Analysis-Time Complexity and Space Complexity- Notation, Omega Notation And Theta Notation, Little O Notation.
- Unit 2: Probabilistic analysis, Amortized analysis, Review of Data Structures-The List ADT, Stack ADT, Queue ADT, Implementations using template Class.
- Unit 3: Collision Resolution In Hashing, Priority Queues-Definition, Priority Queues-Adt, H E A P S-Definition, Insertion and Deletion.
- Unit 4: Applications-Heap Sort, Disjoint Sets-Disjoint Set Adt, Union and Find Algorithms

BLOCK 3: SORTING

- Unit 1: Divide and Conquer: General Method, Applications-Binary Search
- Unit 2: Quick Sort, Merge Sort, Strassen's Matrix Multiplication, Finding Maximum and Minimum
- Unit 3: Warshall's Algorithm and Hoyd's Algorithm
- Unit 4: Backtracking

BLOCK 4: GREEDY METHOD

Unit 1: General Method, Applications-J Ob Sequencing With Dead Lines

Unit 2: 0/1 Knapsack Problem, Minimum Cost Spanning Trees

Unit 3: Tree Vertex Splitting, Optimal Storage on Tapes.

Unit 4: Single Source Shortest Path Problem, Multistage Graphs – All Pair's Shortest Paths, String Editing

BLOCK 5: DYNAMIC PROGRAMMING:

Unit 1: General Method, Applications-Matrix Chain Multiplication,

Unit 2: Optimal Binary Search Trees, Traveling Sales Per Son Problem, Reliability Design

Unit 3: Search Techniques for Graphs – DFS-BFS-Connected Components – Biconnected Components.

Unit 4: General Method – 8-Queens - Sum of Subsets - Graph Coloring – Hamiltonian Cycles. Branch and Bound

Unit 5: Lower Bound Theory: Comparison Trees - Oracles and Advisory Arguments - Lower Bounds through Reduction - Basic Concepts of NP-Hard And NP-Complete problems.

REFERENCE BOOKS

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.
2. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001.
3. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003.
4. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis Of Computer Algorithms", Pearson Education Asia, 2003.
5. Fundamentals of Algorithmics-By Brassard & Bratley, Prentice Hall of India.
6. Introduction to Algorithms-By Cormen, Leiserson, Rivest, Prentice Hall of India .
7. Fundamentals of Computer Algorithms,Horowitz and Sahni, Galgotia publications.
8. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson Education.
9. Introduction to the Design and Analysis of Algorithms, A.Levitin, Pearson Education.
10. Data structures, Algorithms and Applications in C++, S.Sahni, University press (India) Pvt Ltd, 2nd edition, Orient Longman Pvt.Ltd.

SUBJECT CODE: MTC-03
SUBJECT: COMPUTER NETWORK

AIM

To introduce the concepts, terminologies and technologies used in modern days data communication and computer networking.

OBJECTIVES

1. To Understand The Concepts Of Data Communications.
2. To Study The Functions Of Different Layers.
3. To Introduce IEEE Standards Employed In Computer Networking.
4. To Make The Students To Get Familiarized With Different Protocols And Network Components.

BLOCK 1: DATA COMMUNICATIONS

Unit 1: Introduction: Uses Of Computer Networks

Unit 2: Topologies –Protocols And Standards

Unit 3: ISO / OSI Model

Unit 4: Transmission Media.

BLOCK 2: DATA LINK LAYER

Unit 1: Error – Detection And Correction

Unit 2: Error Control

Unit 3: Sliding Window

Unit 4: Ethernet IEEE 802.3, FDDI - Talnet – Bridges.

BLOCK 3: NETWORK LAYER

Unit 1: Internet Works

Unit 2: IP Addressing Methods

Unit 3: Routing – Distance Vector Routing

Unit 4: Link State Routing – Routers

BLOCK 4: TRANSPORT LAYER

Unit 1: Duties of Transport Layer

Unit 2: User Datagram Protocol (UDP)

Unit 3: Transmission Control Protocol (TCP)

Unit 4: Congestion Control – Quality Of Services (QOS)

BLOCK 5: APPLICATION LAYER

Unit 1: Domain Name Space (DNS)

Unit 2: SMTP – FTP

Unit 3: HTTP – WWW

Unit 4: Security – Cryptography

REFERENCES

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
3. Larry L. Peterson and Peter S. Davie, “Computer Networks”, Harcourt Asia Pvt. Ltd., Second Edition.
4. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
5. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.
6. James Chellis Charles Perkins, Matthew Strebe “**Networking Essentials: Study Guide**
7. S.K. Basandra & S. Jaiswal, “**Local Area networks**”, Galgotia Publications
8. Gerd E. Keiser, “**Local Area networks**”
9. Prakash C Gupta, “Data Communication.
10. Data communication and Computer Networks by Forozoun 3rd edition.

SUBJECT CODE: MTC-04

SUBJECT: OPERATING SYSTEMS

AIM

To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems in an operating system.

OBJECTIVES

1. To have an overview of different types of operating systems
2. To know the components of an operating system.
3. To have a thorough knowledge of process management
4. To have a thorough knowledge of storage management
5. To know the concepts of I/O and file systems.

BLOCK 1: OPERATING SYSTEMS

Unit 1: Introduction: Different Types Of Systems

Unit 2: System Components

Unit 3: Operating System Services

Unit 4: Process Concepts

BLOCK 2: THREADS

Unit 1: CPU Scheduling

Unit 2: Scheduling Algorithms

Unit 3: Critical-Section Problem

Unit 4: Semaphores, Synchronization – Critical Regions – Monitors

BLOCK 3: SYSTEM MODEL

Unit 1: Deadlock Characterization – Methods For Handling Deadlocks

Unit 2: Deadlock Prevention – Deadlock Avoidance – Deadlock Detection –
Recovery from Deadlocks

Unit 3: Storage Management

Unit 4: Paging – Segmentation, Segmentation With Paging.

BLOCK 4: VIRTUAL MEMORY

Unit 1: Demand Paging – Process Creation

Unit 2: Page Replacement – Allocation Of Frames, Thrashing

Unit 3: File Concepts – Access Methods, Directory Structure

Unit 4: File Sharing – Protection

BLOCK 5: FILE SYSTEM STRUCTURE

Unit 1: File System Implementation- Directory

Unit 2: Kernel I/O Subsystems, Disk Structure – Disk Scheduling

Unit 3: Disk Management – Swap-Space Management

Unit 4: Case Study: The Linux System, Windows

REFERENCE BOOKS

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.
2. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
3. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India Pvt. Ltd, 2003.
4. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
5. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.
6. Douglas Comer, Operating System Design - The XINU Approach. Prentice-Hall.
7. A.M. Lister, Fundamentals of Operating Systems. Macmillan (1979).
8. Networking Complete – 3rd Edition -- BPB Publication.
9. Mastering Local Area Networks By – Christa Anderson & Mark Minasi -BPB Publication
10. MCSE: Networking Essentials Study Guide -- Tata McGrawHill Publication

SUBJECT CODE: MTC-05

SUBJECT: DATABASE MANAGEMENT SYSTEMS

AIM

To provide a strong foundation in database technology and an introduction to the current trends in this field.

OBJECTIVES

1. To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.
2. To make a study of SQL and relational database design.
3. To understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
4. To know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
5. To have an introductory knowledge about the emerging trends in the area of distributed DB- OO DB- Data mining and Data Warehousing and XML.

BLOCK 1: INTRODUCTION AND CONCEPTUAL MODELING

Unit 1: Introduction to File and Database Systems

Unit 2: Database System Structure

Unit 3: Data Models Introduction to Network and Hierarchical Models

Unit 4: ER Model Relational Model Relational Algebra and Calculus.

BLOCK 2: RELATIONAL MODEL

Unit 1: SQL – Data Definition

Unit 2: Queries in SQL- Updates- Views

Unit 3: Normalization First, Second

Unit 4: Normalization for Relational Databases (Up To BCNF).

BLOCK 3: DATA STORAGE AND QUERY PROCESSING

Unit 1: Record Storage and Primary File Organization

Unit 2: Operations on Files

Unit 3: Hashing Techniques, Query Processing

Unit 4: Different Types of Indexes- B-Tree - B+Tree

BLOCK 4: TRANSACTION MANAGEMENT

Unit 1: Introduction- Need for Concurrency Control

Unit 2: Schedule and Recoverability

Unit 3: Types of Locks

Unit 4: Deadlock, Recovery Techniques

BLOCK 5: CURRENT TRENDS

Unit 1: Object Oriented Databases

Unit 2: Complex Types, Inheritance Reference Types

Unit 3: Distributed Databases, Distributed Data Storage

Unit 4: Querying and Transformation

REFERNCE BOOKS

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.
2. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
3. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill Publishing Company, 2003.
4. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- “Database System Implementation”- Pearson Education- 2000.
5. Peter Rob and Corlos Coronel- “Database System, Design, Implementation and Management”, Thompson Learning Course Technology- Fifth edition, 2003.
6. Date C J, “An Introduction To Database System”, Addison Wesley
7. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
- 8.. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addison Wesley
9. Leon & Leon, “Database Management System”, Vikas Publishing House.
10. Bipin C. Desai, “An introduction to Database Systems”, Galgotia Publication
11. Majumdar & Bhattacharya, “Database Management System”, TMH
12. Ramakrishnan, Gehrke, “Database Management System”, McGraw Hill
13. Kroenke, “Database Processing: Fundamentals, Design and Implementation”, Pearson Education.
14. Maheshwari Jain, “DBMS: Complete Practical Approach”, Firewall Media, New

Delhi.

SUBJECT CODE: MTC-P1

SUBJECT: DATABASE MANAGEMENT SYSTEM LAB

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

SUBJECT CODE: MTC-P2

SUBJECT: OPERATING SYSTEM LAB

1. Shell Programming: Creating A Script, Making A Script Executable, Shell Syntax (Variables, Conditions,Control Structures, Functions, Commands).
2. Process: Starting New Process, Replacing A Process Image, Duplicating A Process Image, Waiting For A Process, Zombie Process.
3. Signal: Signal Handling, Sending Signals, Signal Interface, Signal Sets.
4. Semaphore: Programming With Semaphores (Use Functions Semctl, Semget, Semop, Set_Semvalue,Del_Semvalue, Semaphore_P, Semaphore_V).
5. POSIX Threads: Programming With Pthread Functions(Viz. Pthread_Create, Pthread_Join, Pthread_Exit,Pthread_Attr_Init, Pthread_Cancel)
6. Inter-Process Communication: Pipes (Use Functions Pipe, Popen, Pclose), Named Pipes (Fifos,Accessing FIFO)

SUBJECT CODE: MTC-06

SUBJECT: ADVANCED MATHEMATICS

BLOCK 1 FOURIER SERIES

Unit1: Periodic Functions

Unit 2: Fourier series Of Functions

Unit 3: Fourier Cosine & Sine Series

Unit 4: Odd & Even Functions

BLOCK 2 PARTIAL DIFFERENTIAL EQUATIONS OF FIRST ORDER

Unit 1: Ormation Lagrange's Methods

Unit 2: Tandard Types of Non Linear Equations

Unit 3: Harpits Methods

Unit4: Fourier series Solutions

BLOCK 3 COMPLEX VARIABLES

Unit 1: Complex Functions

Unit 2: Analytical Itemann Equations of Cartesian & Polar Forms

Unit 3: Calculus of Variables

Unit 4: Euler's Equations

BLOCK 4 FINITE DIFFERENCES

Unit 1: Differences Table Interpolation

Unit 2: Newton's Forward & Backward Formale

Unit 3: Rosphon Methods

Unit 4: Computation Of Eigen Value

BLOCK 5 NUMERICAL SOLUTIONS OF DIFFERENTIAL EQUATIONS

Unit 1: Numerical Differentiation

Unit 2: Numerical Integration

Unit 3: Euler's & Modified Euler's Method

Unit 4: Taylor's,Runga Kutta's & Midne's Method

Reference Books:-

1. N.Snaddon: Special Functions Of Mathematical Physics And Chemistry –ELBS.
2. Murray R.Spigal. Complex Variables - Pub. Sham Series.
3. Murray R.Spigal .Advanced Calculus - Pub. Sham Series.
4. E.El's Golts Differential Equation With Calculus Of Variations – Mir Publications
Mascow.
5. F.Shield - Numerical Analysis - Pub. Sham Series.
6. S.S. Shastry - Numerical Analysis
7. Wolf R.W., “Stochastic Modelling of Queues”, Prentice Hall, 1989.
8. Cinlor E.lor H. “A First course in Stochastic Processes”, 2nd edition, Academic
press, 1975.
9. Hopcroft J.E. and Ullman J.D. “Introduction to Automata, languages and
computation”, Addition Wesley, 2000.
10. Chui.C.K., “An introduction to Wavelets”, Academic Press, 1992.
11. Simon Haykins, “Communication systems”, John Wiley & sons fourth edition,
2000.
12. C. Sidney Burrus [Contributor], Ramesh A. Gopinath, Haitao Guo, “Introduction
to Wavelets and Wavelets Transforms”, 1st Edition, Prentice Hall, 1997.

SUBJECT CODE: MTC-07

SUBJECT: MOBILE COMPUTING

AIM

To provide basics for various techniques in Mobile Communications and Mobile Content services.

OBJECTIVES

1. To learn the basics of Wireless voice and data communications technologies.
2. To build working knowledge on various telephone and satellite networks.
3. To study the working principles of wireless LAN and its standards.
4. To build knowledge on various Mobile Computing algorithms.
5. To build skills in working with Wireless application Protocols to develop mobile content applications.

BLOCK 1: WIRELESS COMMUNICATION FUNDAMENTALS

Unit 1: Introduction – Wireless Transmission

Unit 2: Frequencies For Radio Transmission – Signals – Antennas

Unit 3: Propagation – Multiplexing – Modulations

Unit 4: Mac – SDMA – FDMA – TDMA – CDMA

BLOCK 2: TELECOMMUNICATION NETWORKS

Unit 1: Telecommunication Systems – GSM – GPRS – DECT

Unit 2: Satellite Networks - Basics Parameters and Configurations

Unit 3: Capacity Allocations – FAMA and DAMA

Unit 4: Broadcast Systems – DAB - DVB

BLOCK 3: WIRELESS NETWORKS

Unit 1: Wireless Lan – IEEE 802.11 Standards

Unit 2: Architecture – Services – Mac – Physical Layer

Unit 3: IEEE 802.11a - 802.11b Standards

Unit 4: Hiperlan – Blue Tooth

BLOCK 4: MOBILE NETWORK LAYER

Unit 1: Mobile IP

Unit 2: Dynamic Host Configuration Protocol

Unit 3: Routing – DSDV

Unit 4: DSR – Alternative Metrics.

BLOCK 5: TRANSPORT AND APPLICATION LAYERS

Unit 1: Traditional TCP

Unit 2: Classical TCP Improvements

Unit 3: WAP

Unit 4: WAP 2.0

REFERENCE BOOKS

1. Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003.
2. William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)
3. Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.
4. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.
5. Hazysztow Wesolowshi, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.
- 6) Reza Behravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, October 2004,
- 7) Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, “Fundamentals of Mobile and Pervasive Computing”, ISBN: 0071412379, McGraw-Hill Professional, 2005.
- 8) Hansmann, Merk, Nicklous, Stober, “Principles of Mobile Computing”, Springer, second edition, 2003.
- 9) Martyn Mallick, “Mobile and Wireless Design Essentials”, Wiley DreamTech, 2003
- 10) Stojmenovic and Cacute, “Handbook of Wireless Networks and Mobile Computing”, Wiley, 2002, ISBN 0471419028.

SUBJECT CODE: MTC-08

SUBJECT: ADVANCED COMPUTER ARCHITECTURE

AIM

To do an advanced study of the Instruction Set Architecture, Instruction Level Parallelism with hardware and software approaches, Memory and I/O systems and different multiprocessor architectures with an analysis of their performance.

OBJECTIVES

1. To study the ISA design, instruction pipelining and performance related issues.
2. To do a detailed study of ILP with dynamic approaches.
3. To do a detailed study of ILP with software approaches.
4. To study the different multiprocessor architectures and related issues.
5. To study the Memory and I/O systems and their performance issues.

BLOCK 1: INTRODUCTION

Unit 1: Fundamentals of Computer Design

Unit 2: Quantitative Principles of Computer Design

Unit 3: Instruction Set Principles – Classifying ISA – Design Issues

Unit 4: Pipelining – Basic Concepts – Hazards – Implementation

BLOCK 2: INSTRUCTION LEVEL PARALLELISM WITH DYNAMIC APPROACHES

Unit 1: Concepts – Dynamic Scheduling

Unit 2: Dynamic Hardware Prediction

Unit 3: Multiple Issue – Hardware Based Speculation

Unit 4: Limitations of ILP.

BLOCK 3: INSTRUCTION LEVEL PARALLELISM WITH SOFTWARE APPROACHES

Unit 1: Compiler Techniques for Exposing ILP

Unit 2: Advanced Compiler Support

Unit 3: Hardware Support for Exposing More Parallelism

Unit 4: Hardware Versus Software Speculation Mechanisms

BLOCK 4: MEMORY AND I/O

Unit 1: Cache Performance – Reducing Cache Miss Penalty and Miss Rate

Unit 2: Main Memory and Performance – Memory Technology

Unit 3: Types of Storage Devices – Buses – Raid

Unit 4: I/O Performance Measures – Designing an I/O System.

BLOCK 5: MULTIPROCESSORS AND THREAD LEVEL PARALLELISM

Unit 1: Symmetric and Distributed Shared Memory Architectures

Unit 2: Performance Issues – Synchronization

Unit 3: Models of Memory Consistency

Unit 4: Multithreading

REFERENCE BOOKS

1. John L. Hennessey and David A. Patterson, "Computer Architecture: A Quantitative Approach", Morgan Kaufmann, 2003, Third Edition.
2. D.Sima, T.Fountain and P.Kacsuk, "Advanced Computer Architectures: A Design Space Approach", Addison Wesley, 2000.
3. Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw-Hill, New Delhi, 2003.
4. D.A.Patterson and J.L.Hennessey, "Computer organization and Design", Morgan Kaufmanns, 2nd Edition
5. V.Rajarm & C.S.R.Murthy, "Parallel Computer", PHI.
6. Computer Architecture: A Quantitative Approach by John L. Hennessy and David A. Patterson. 4th Edition. Morgan-Kaufmann. 2006. ISBN: 0123704901.
7. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.
8. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
9. Patterson and Hennessy, Computer Architectures, Morgan Kaufman, San Mateo, CA, USA, 1992.
10. P.Pal Chaudhary, Computer Organization and Design Prentice Hall of India Pvt. Ltd., New Delhi, 1994.

SUBJECT CODE: MTC-09

SUBJECT: WEB TECHNOLOGY

BLOCK 1: WEB ESSENTIALS

Unit 1: Web Essentials – Clients – Servers - Communication

Unit 2: Markup Languages -Html

Unit 3: Simple Xhtml Pages Style Sheets

Unit 4: CSS-Introduction to Cascading Style Sheets

BLOCK 2: Client side programming

Unit 1: Java Script Language

Unit 2: Java Script Objects

Unit 3: Host Objects

Unit 4: Browsers and The DOM

BLOCK 3: SERVER SIDE PROGRAMMING

Unit 1: Java Servlets – Basics – Simple Program

Unit 2: Separating Programming And Presentation

Unit 3: ASP/JSP - JSP Basics ASP/JSP Objects

Unit 4: Simple ASP/JSP Pages

BLOCK 4: REPRESENTING WEB DATA

Unit 1: Data Base Connectivity – JDBC

Unit 2: Dynamic Web Pages – Xml

Unit 3: DTD – Xml Schema

Unit 4: Dom – Sax – Xquery.

BLOCK 5: BUILDING WEB APPLICATIONS

Unit 1: Cookies – Sessions

Unit 2: Open Source Environment – Php

Unit 3: MYSQL

Unit 4: Case Studies

REFERENCE BOOKS:

1. Jeffrey C Jackson, “Web Technology – A computer Science perspective”, Person Education, 2007.
2. Chris Bates, “Web Programming – Building Internet Applications”, “Wiley India, 2006

3. Eric Ladd, Jim O' Donnel, "Using HTML 4, XML and JAVA", Prentice Hall of India – QUE, 1999.
4. Aferganatel, "Web Programming: Desktop Management", PHI, 2004.
5. Rajkamal, "Web Technology", Tata McGraw-Hill, 2001.
6. Complete reference HTML.
7. JavaScript Bible
8. HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross
9. VBScript Programmers reference wrox Press
10. VBScript in Nutshell
11. Internet Technology at work Hofstetter fred
12. Beginning XML Wrox Press
13. XML how to program Deitel & Deitel.
14. Programming the World Wide Web Robert W. Sebesta
15. Web enabled commercial application development using HTML, DHTML, JavaScript, PERL-CGI Ivan Bayross.
16. Programming ASP Ivan Bayross
17. Beginning ASP 3.0 Wrox press

SUBJECT CODE: MTC-P3**SUBJECT: C++ AND DATA STRUCTURES LAB****AIM**

To teach the principles of good programming practice and to give a practical training in writing efficient programs in C++

OBJECTIVES

1. To Teach The Students To Write Programs In C++
 2. To Implement The Various Data Structures As Abstract Data Types
 3. To Write Programs To Solve Problems Using The Adts
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1. Implement PUSH, POP operations of stack using Arrays
 2. Implement PUSH, POP operations of stack using Pointers.
 3. Implement add, delete operations of a queue using Arrays.
 4. Implement add, delete operations of a queue using Pointers.
 5. Conversion of infix to postfix using stack operations
 - 6 Postflx Expression Evaluation.
 7. Addition of two polynomials using Arrays and Pointers.
 - 8 Creation, insertion, and deletion in doubly linked list.
 9. Binary tree traversals (in-order, pre-order, and post-order) using linked list.
 10. Depth First Search and Breadth first Search for Graphs using Recursion.

SUBJECT CODE: MTC-P4

SUBJECT: WEB TECHNOLOGY LAB

Creation of HTML pages with frames, links, tables and other tags

- Usage of internal and external CSS along with HTML pages
- Client side Programming
 - # Java script for displaying date and comparing two dates
 - # Form Validation including text field, radio buttons, check boxes, list box and other controls
- Usage of ASP/JSP objects response, Request, Application, Session, Server, ADO etc
 - # Writing online applications such as shopping, railway/air/bus ticket reservation system with set of ASP/JSP pages
 - # Using sessions and cookies as part of the web application
- Writing Servlet Program using HTTP Servlet
- Any online application with database access
- Creation of XML document for a specific domain
- Writing DTD or XML schema for the domain specific XML document
- Parsing an XML document using DOM and SAX Parsers
- Sample web application development in the open source environment

SUBJECT CODE: MTC-10

SUBJECT: MULTIMEDIA & COMPUTER GRAPHICS

AIM

To impart the fundamental concepts of Computer Graphics and Multimedia.

OBJECTIVES

1. To study the graphics techniques and algorithms.
2. To study the multimedia concepts and various I/O technologies.
3. To enable the students to develop their creativity

BLOCK 1: OUTPUT PRIMITIVES

Unit 1: Introduction - Line - Curve and Ellipse

Unit 2: Drawing Algorithms -Attributes

Unit 3: Two-Dimensional Geometric Transformations

Unit 4: Two-Dimensional Clipping and Viewing

BLOCK 2: THREE-DIMENSIONAL CONCEPTS

Unit 1: Three-Dimensional Object Representations

Unit 2: Three-Dimensional Geometric and Modeling Transformations

Unit 3: Three-Dimensional Viewing

Unit 4: Color Models – Animation

BLOCK 3: MULTIMEDIA SYSTEMS DESIGN

Unit 1: An Introduction – Multimedia Applications

Unit 2: Multimedia System Architecture

Unit 3: Evolving Technologies for Multimedia

Unit 4: Multimedia Data Interface Standards – Multimedia Databases.

BLOCK 4: MULTIMEDIA FILE HANDLING

Unit 1: Compression & Decompression – Data & File Format Standards

Unit 2: Multimedia I/O Technologies - Digital Voice and Audio

Unit 3: Video Image and Animation – Full Motion Video

Unit 4: Storage and Retrieval Technologies.

BLOCK 5: HYPERMEDIA

Unit 1: Multimedia Authoring & User Interface

Unit 2: Hypermedia Message Component

Unit 3: Integrated Document Management – Distributed Multimedia Systems

Unit 4: Creating Hypermedia Message – Integrated Multimedia Message Standards

REFERENCES

1. Judith Jeffcoate, “Multimedia in practice technology and Applications”, PHI, 1998.
2. Foley, Vandam, Feiner, Huges, “Computer Graphics: Principles & Practice”, Pearson Education, second edition 2003.
3. Donald Hearn and M.Pauline Baker, “Computer Graphics C Version”, Pearson Education, 2003.
4. (UNIT I : Chapters 1 to 6; UNIT 2: Chapter 9 – 12, 15, 16)
5. Prabat K Andleigh and Kiran Thakrar, “Multimedia Systems and Design”, PHI, 2003. (UNIT 3 to 5)
6. Multimedia System Design- K. Andleigh and K. Thakkrar
7. Multimedia: Computing, Communication & Application - Ralf stein Metz and Klara Nahrstedt
8. . Advanced multimedia programming - Steve Rimmer
9. “Computer Graphics C version”, Donald Hearn and M.Pauline Baker, Pearson Education
10. . “Computer Graphics Principles & practice”, second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
11. “Computer Graphics”, second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
12. Computer Graphics Second edition”, Zhigand xiang, Roy Plastock, Schaum’s outlines, Tata Mc-Graw hill edition.

SUBJECT CODE: MTC-11

SUBJECT: DATA COMMUNICATION & NETWORKING

BLOCK 1: FUNDAMENTALS OF DATA COMMUNICATION

Unit 1: Introduction to Data Communication

Unit 2: Protocols & Standards

Unit 3: Topology

Unit 4: Classification of Network

BLOCK 2: TRANSMISSION & SWITCHING

Unit 1: Parallel & Serial Transmission

Unit 2: Multiplexing Application

Unit 3: Different Types of Switching

Unit 4: Connection Oriented & Connectionless Services

BLOCK 3: MULTIPLEXING

Unit 1: Interface Standards

Unit 2: Types of Error

Unit 3: Error Correction & Detection

Unit 4: Multiplexing

BLOCK 4: ANALOG & DIGITAL NETWORK

Unit 1: History of Analog & Digital Network

Unit 2: Types of ISDN

Unit 3: Routers & Gateways

Unit 4: ATM & its Types

BLOCK 5: ROUTING ALGORITHM

Unit 1: Repeaters & Bridges

Unit 2: Routing Algorithm

Unit 3: TCP/IP Network

Unit 4: WWW

REFERENCE BOOKS:-

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH-2001
2. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/McGraw Hill - 1998.
3. Tanenbaum A., "Computer Networks", 4th Edition, PHI, ISBN 81 – 203 – 2175 – 8
4. Fourauzan B., "Data Communications and Networking", 3rd edition, Tata McGraw-Hill Publications, 2004, ISBN 0 – 07 – 058408 – 7
5. Keshav S., "An Engineering Approach to Computer Networking", Perason Education, ISBN 981 – 235 – 986 – 9
6. Comer D., "Computer Networks and Internet", 2ND Edition, Pearson Education, ISBN 81 – 7808 – 086 – 9
7. Gallo M., Hancock W., "Computer Communications and Networking Technologies", Thomson Brooks/Cole, ISBN 981 – 240 – 354 – X
8. Electronic communication Systems by Kennedy.
9. Communication systems by Singh and Sapre.
10. Data communication by Fred Halsall, Pearson Education.

SUBJECT CODE: MTC-12

SUBJECT: ARTIFICIAL NEURAL NETWORKS

BLOCK 1: INTRODUCTION

Unit 1: Fundamentals of Computer Design

Unit 2: Quantitative Principles Of Computer Design

Unit 3: Instruction set Principles – Classifying ISA – Design issues

Unit 4: Pipelining – Basic concepts – Hazards – Implementation

BLOCK 2: INSTRUCTION LEVEL PARALLELISM WITH DYNAMIC APPROACHES

Unit 1: Concepts – Dynamic Scheduling

Unit 2: Dynamic Hardware Prediction

Unit 3: Multiple issues – Hardware Based Speculation

Unit 4: Limitations of ILP.

BLOCK 3: INSTRUCTION LEVEL PARALLELISM WITH SOFTWARE APPROACHES

Unit 1: Compiler Techniques for Exposing ILP

Unit 2: Advanced Compiler Support

Unit 3: Hardware Support for Exposing More Parallelism

Unit 4: Hardware versus Software Speculation Mechanisms

BLOCK 4: MEMORY AND I/O

Unit 1: Cache performance – Reducing Cache Miss Penalty and Miss Rate

Unit 2: Main memory and performance – Memory Technology

Unit 3: Types of Storage Devices – Buses – RAID

Unit 4: I/O Performance Measures – Designing an I/O system.

BLOCK 5: MULTIPROCESSORS AND THREAD LEVEL PARALLELISM

Unit 1: Symmetric and Distributed Shared Memory Architectures

Unit 2: Performance Issues – Synchronization

Unit 3: Models of Memory Consistency

Unit 4: Multithreading

Reference Books:-

1. B.Yegnanarayana, Artificial Neural Networks, Prentice Hall of India, 1999
2. Satish Kumar, Neural Networks – A Classroom Approach, Tata McGraw-Hill, 2003
3. S.Haykin, Neural Networks – A Comprehensive Foundation, Prentice Hall, 1998
4. C.M.Bishop, Pattern Recognition and Machine Learning, Springer, 2006
5. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/ Pearson Education.
6. Artificial Neural Networks B. Yagna Narayana, PHI
7. Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).
8. Artificial Intelligence and Expert Systems – Patterson PHI.
9. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
10. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.
11. Neural Networks Simon Haykin PHI
12. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition.

SUBJECT CODE: MTC-13

SUBJECT: SYSTEM MODELING & SIMULATION

AIM

To build knowledge on system modeling and system study on various applications.

OBJECTIVES

1. To Provide A Strong Foundation On Concept Of Simulation, And Modeling.
2. To Understand The Techniques Of Random Number Generations.
3. To Understand The Techniques Of Testing Randomness.
4. To Design Simulation Models for Various Case Studies like Inventory, Traffic Flow Networks, Etc.
5. To Practice On Simulation Tools And Impart Knowledge On Building Simulation Systems.

BLOCK 1: INTRODUCTION

Unit 1: Systems, Modeling, General Systems Theory

Unit 2: Concept of Simulation

Unit 3: Simulation as a Decision Making Tool

Unit 4: Types of Simulation

BLOCK 2: RANDOM NUMBERS

Unit 1: Pseudo random numbers

Unit 2: Methods of generating random variables

Unit 3: Discrete and continuous distributions,

Unit 4: Testing of random numbers.

BLOCK 3: DESIGN OF SIMULATION EXPERIMENTS

Unit 1: Problem Formulation, Data Collection and Reduction

Unit 2: Time Flow Mechanism, Key Variables, Logic Flow Chart

Unit 3: Starting Condition, Run Size, Experimental Design Consideration

Unit 4: Output Analysis and Interpretation Validation.

BLOCK 4: SIMULATION LANGUAGES

Unit 1: Comparison and Selection of Simulation Languages

Unit 2: Study of Anyone Simulation Language

BLOCK 5: CASE STUDIES

Unit 1: Development of Simulation Models

Unit 2: Simulation Language Studied For Systems Like Queuing Systems

Unit 3: Production Systems, Inventory Systems, Maintenance

Unit 4: Replacement Systems and Investment Analysis.

REFERENCES:-

1. Jerry Banks and John S.Carson, Barry L. Nelson, David M.Nicol, “Discrete Event System Simulation”, 3rd Edition, Prentice Hall, India, 2002.
2. Shannon, R.E. Systems simulation, the art and science, Prentice Hall, 1975.
3. Thomas J. Schriber, Simulation using GPSS, John Wiley, 1991.
4. Geoffrey Gordon, “System Simulation”, 2nd Edition, Prentice Hall, India, 2002.
5. Narsingh Deo, “System Simulation with Digital Computer, “Prentice Hall, India, 2001.
6. Decision Support and Data Warehouse Systems – Efrem G Mallach
University Massachusetts Lowell, Tata Mcgrew Hill
7. Data Warehousing, Data Mining & OLAP- Berson Tata McGraw
Hill, 1/e
8. Decision Support System & Data Warehousing – B Ravindranath
9. **Discrete-Event System Simulation 3rd. Ed., Banks, J., Carson, Prentice-Hall
2005**
10. **Discrete Systems Simulation, Khoshnevis, B. , McGraw-Hill, 1994**

SUBJECT CODE: MTC-P5

SUBJECT: DESIGN & ANALYSIS OF ALGORITHM LAB

1. Perform recursive binary and linear search.
2. Sort a given set of elements using Heap sort technique.
3. Sort a given set of elements using Merge sort technique.
4. Check whether a graph is connected using Depth first technique.
5. Sort a given set of elements using Selection sort technique.
6. Obtain the topological ordering of vertices in a given digraph.
7. Sort a given set of elements using Insertion sort technique.
8. Implement 0/1 knapsack problem using memory function dynamic programming.
9. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
10. Sort a given set of elements using Quick sort technique.
11. Find minimum cost spanning tree of a given undirected graph using Kruskal's algorithm.
12. Print all the nodes reachable from a given starting node in a digraph using Breadth first search technique.
13. Implement all pair shortest paths problem using Floyd's algorithm.
14. Find a subset of a given set $S = \{s_1, s_2, \dots, s_n\}$ of n positive integers whose sum is equal to a given positive integer d . A suitable message is to be displayed if the given problem instance does not have a solution.
15. Implement Horspool algorithm for string matching.
16. Find the binomial coefficient using dynamic programming.
17. Find minimum cost spanning tree for a given undirected graph using Prim's algorithm.
18. Print all the nodes reachable from a given starting node in a given digraph using Depth first search technique.
19. Compute the transitive closure of a given directed graph using Warshall's algorithm.
20. Implement n-Queens problem using backtracking technique.

SUBJECT CODE: MTC-P6

SUBJECT: DATA COMMUNICATION & NETWORKING LAB

1. PC-to-PC COMMUNICATIONS UNDER WIN98/WIN2000's DIRECT CABLE CONNECTION with NULL MODEM
 - a) Using Serial Ports and RS-232 C Cable Connection
 - b) Using Parallel Ports and Direct Parallel Cable Connection
2. PC-to-PC COMMUNICATIONS UNDER WIN 98/WIN2000's DIAL-UP NETWORKING with MODEM and 4-LINE EXCHANGE
3. PC-to-PC COMMUNICATIONS UNDER WIN 98/WIN2000's HYPER TERMINAL with MODEM and 4-LINE EXCHANGE
4. LAN WITH BUS/STAR(Switch or Hub) TOPOLOGY with a minimum of two systems i) Windows Peer-to-Peer Network ii) Windows NT Client-Server Network
5. LAN WITH BUS/STAR(Switch or Hub) TOPOLOGY with a minimum of two systems using NOVELL Netware
6. TERMINAL NETWORK WITH UNIX/LINUX SERVER and one or two Terminals using Serial Ports
7. TERMINAL NETWORK WITH UNIX/LINUX SERVER, 8 – port Terminal Server and one or two terminals
8. Identifying well known ports on a Remote System :
9. By trying to listen to the various well known ports by opening client connections. If the exception does not occur then the remote port is active else the remote port is inactive.
Writing a Chat application :
 - i). One-One: By opening socket connection and displaying what is written by one party to the other.

ii). Many-Many (Broad cast): Each client opens a socket connection to the chat server and writes to the socket. Whatever is written by one party can be seen by all other parties.

10. Data retrieval from a Remote database:

At the remote database a server listens for client connections. This server accepts SQL queries from the client, executes it on the database and sends the response to the client.

REFERENCE BOOKS:-

The Complete Reference Series : WIN98/WIN2000/UNIX/RED HAT X/Networking, T
M H Edition

SUBJECT CODE: MTC-14

SUBJECT: ASP.Net & C Sharp

BLOCK 1 FUNDAMENTALS CONCEPT OF ASP.NET

Unit 1: Overview of ASP.Net framework

Unit 2: ASP.Net Controls & Applications

Unit 3: Installation of IIS

Unit 4: Web Form & Controls

BLOCK 2 FORM VALIDATIONS

Unit 1: Client Side & Server Side Validation

Unit 2: Validation Controls

Unit 3: State Management

Unit 4: Architecture of Ado.Net

BLOCK 3 DATABASE CONNECTIVITY

Unit 1: Connected & Disconnected Database

Unit 2: Creating Connection Using Ado.Net

Unit 3: Different Types of Connection Class

Unit 4: Display Data on Data Bound Controls

BLOCK 4 WEB APPLICATION & SERVICES

Unit 1: Writing & Reading Datasets to Xml

Unit 2: Web Services

Unit 3: Building & Consuming Web Services

Unit 4: Web Application Deployment

BLOCK 5 FUNDAMENTALS OF C#

Unit 1: Overview of C#

Unit 2: C# and .Net

Unit 3: Structure of C# Program

Unit 4: Language Features

REFERENCE BOOKS:-

1. VB.NET Black Book by steven holzner –dreamtech
2. ASP.NET Unleashed
3. C# programming – wrox publication
4. C# programming Black Book by Matt telles
5. Microsoft® [ASP.NET](#) 3.5 Step by Step -Author George Shepherd-ISBN 9780735624269 -MS Press.
6. C# developer's guide to ASP.NET, XML, and ADO.NET-Jeffrey P. McManus, Chris Kinsman - 2002
7. C-sharp and VB.NET -Jose Mojica – 2002.
8. C# 4.0 in a Nutshell: The Definitive Reference -Joseph Albahari, Ben Albahari - 2010
9. C#.net: web developer's guide -Adrian Turtschi - 2002
10. Programming .NET components -Juval Löwy - 2005

SUBJECT CODE: MTC-15

SUBJECT: NETWORK SECURITY

BLOCK 1: INTRODUCTION

Unit 1: Attacks - Services - Mechanisms

Unit 2: Conventional Encryption

Unit 3: Classical and Modern Techniques – Encryption Algorithms

Unit 4: Confidentiality

BLOCK 2: PUBLIC KEY ENCRYPTION

Unit 1: RSA

Unit 2: Elliptic Curve Cryptography

Unit 3: Number Theory Concepts

BLOCK 3: MESSAGE AUTHENTICATION

Unit 1: Hash Functions

Unit 2: Digest Functions

Unit 3: Digital Signatures

Unit 4: Authentication Protocols

BLOCK 4: NETWORK SECURITY PRACTICE

Unit 1: Authentication

Unit 2: Applications - Electronic Mail Security

Unit 3: IP Security

Unit 4: Web Security.

BLOCK 5: SYSTEM SECURITY

Unit 1: Intruders – Viruses

Unit 2: Worms

Unit 3: Firewalls Design Principles

Unit 4: Trusted Systems.

REFERENCES:

1. Bruce, Schneier, Applied Cryptography, 2nd Edition, Toha Wiley & Sons, 1996.
2. Man Young Rhee, “Internet Security”, Wiley, 2003.
3. Pfleeger & Pfleeger, “Security in Computing”, Pearson Education, 3rd Edition, 2003.
4. Stallings, Cryptography & Network Security - Principles & Practice, Prentice Hall, 3rd Edition 2002.

5. Britz, M. (2008). *Computer forensics and cyber-crime, 2e*. Upper Saddle River, NJ: Prentice Hall ISBN: 0132447495.
6. Network security Essentials: Applications and Standards-William Stallings.-Pearson Education.
7. Cryptography and Network Security-William Stallings-Pearson Education.
8. Behrouz A. Forouzan, Cryptography & Network Security, Special Indian Edition.
9. William Stallings, Cryptography and Network Security, Third Edition, Pearson Education/PHI, 2003
10. Atul Kahate, Cryptography and Network Security, Tata Mc Graw Hill, 2003

SUBJECT CODE: MTC-16

SUBJECT: ADVANCED MICROPROCESSORS

BLOCK 1: ADVANCED MICROPROCESSOR ARCHITECTURE

Unit 1: Internal Microprocessor Architecture

Unit 2: Types of Addressing Modes

Unit 3: Types of Instruction

Unit 4: Memory Paging

BLOCK 2: MODULAR PROGRAMMING & ITS CONCEPTS

Unit 1: Modular Programming

Unit 2: Keyboard & Video Display

Unit 3: Data Conversions

Unit 4: Assembly Language with C/C++

BLOCK 3: PENTIUM PROCESSOR

Unit1: Introduction to Pentium Processor

Unit2: Pentium Memory Management

Unit3: New Pentium Instructions

Unit4: Special Pentium Pro Features

BLOCK 4: BIT MICRO CONTROLLER

Unit 1: Internal Microprocessor Architecture

Unit 2: High Speed Input & Output

Unit 3: Interrupts

Unit 4: Instruction Set

BLOCK 5: RISK PROCESSOR & ARM

Unit 1: Characteristics of Risk Architecture

Unit 2: Pipeline Bubbles

Unit 3: Arm Processors

Unit 4: Data Movement & Memory Reference Instruction

REFERENCE BOOKS

1. Barry B. Brey, The Intel Microprocessors 8086/8088, 80, 86, 80286, 80386 80486, Pentium, Pentium Pro Processor, Pentium II, Pentium III, Pentium 4, Architecture, Programming and interfacing, Prentice Hall of India Private Limited, New Delhi, 2003. (UNIT I, II and III)
2. John Peatman, Design with Microcontroller McGraw Hill Publishing Co Ltd, New Delhi. (UNIT IV)
3. Alan Clements, "The principles of computer Hardware", Oxford University Press, 3rd Edition, 2003. (UNIT V)
4. Rajkamal, The concepts and feature of micro controllers 68HC11, 8051 and 8096; S Chand Publishers, New Delhi
5. Microprocessors & Interfacing – Programming & hardware By D. V. Hall (TMH)
6. The 8088 AND 8086 microprocessors By Walter A. Trebel & Avtar Singh (PHI)
7. 8086 Microprocessor By Uffenbeck (PHI)
8. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor Architecture, programming and interfacing. By Barry B. Brey (PHI).
9. The 8051 Microcontroller: Architecture, programming and applications By Kenneth J. Ayala (Penram International)
10. The 8051 Microcontroller and Embedded Systems By Mazidi & Mazidi (PHI).

SUBJECT CODE: MTC-E1

SUBJECT: PATTERN RECOGNITION & IMAGE PROCESSING

BLOCK 1: INTRODUCTION

Unit 1: Digital Image Processing

Unit 2: Problems & Application

Unit 3: Image Representation & Modeling

Unit 4: 2d System & Necessary Mathematical Preliminaries

BLOCK 2: IMAGE TRANSFORMS

Unit 1: Different Types of Image Transforms

Unit 2: Image Enhancement

Unit 3: Image Filtering

Unit 4: Filtering Using Image Transforms

BLOCK 3: IMAGE ANALYSIS

Unit 1: Spatial Features Extraction

Unit 2: Boundary Representation

Unit 3: Region Representation

Unit 4: Moment Representation

BLOCK 4: APPROACHES TO PATTERN RECOGNITION

Unit 1: Pattern Vectors & Pattern Classes

Unit 2: Pattern Preprocessing

Unit 3: Pattern Classification Methods

Unit 4: Statistical Approach

BLOCK 5: RECOGNITION TECHNIQUES

Unit 1: Clustering Techniques

Unit 2: MMD and KNN Approaches

Unit 3: Automatic Clustering Formation

Unit 4: Approach to Pattern Recognition

REFERENCE BOOKS:-

- 1) Fundamentals of Digital Image Processing – A.K. Jain (PHI)
- 2) Introductory Computer Vision and Image Processing – A. Low (MGH)
- 3) Pattern Recognition Principles – J.T. Tou, R.C.Gonzalez (Addison-Wesley)
- 4) Rafael C. Gonzalez and Richard E. Woods-Digital Image Processing, 2nd Edition, Prentice Hall, 2002.,ISBN: 0-201-18075-8 .
- 5) Rafael C. Gonzalez and Richard E. Woods-Digital Image Processing, 3rd Edition, Pearson Prentice Hall, 2008,ISBN: 0-13-168728-x or 978-0-13-168728-8 .
- 6) Eart Gose, Richard Johnsonburg and Steve Joust, “Pattern Recognition and Image Analysis”,Prentice-Hall of India-2003.
- 7) Duda and Hart, “Pattern recognition (Pattern recognition a scene analysis)”
- 8) Robert J Schalkoff, “Pattern recognition : Statistical ,Structural and neural approaches”, JohnWiley
- 9) Milan Sonka Vaclav Hlavac Roger Boyle,”Image Processing, Analysis, and Machine Vision”,Second Edition, Thomson Publication
- 10) Rafel Gonzallez and R. Woods,” Digital Image Processing”, Second edition,

SUBJECT CODE: MTC-E2

SUBJECT: NEURAL NETWORKS

BLOCK 1: INTRODUCTION TO NEURAL NETWORKS

Unit 1: Introduction

Unit 2: Human & Computers

Unit 3: Biological & Artificial Neuron Models

Unit 4: Characteristics of ANN

BLOCK 2: ESSENTIALS OF ARTIFICIAL NEURAL NETWORKS

Unit 1: Artificial Neuron Model

Unit 2: Types of Neuron Activation Rules

Unit 3: Classification Taxonomy of ANN

Unit 4: Connectivity Learning Activity

BLOCK 3: SINGLE LAYER FEED FORWARD NEURAL NETWORKS

Unit 1: Introduction

Unit 2: Perception Models

Unit 3: Discrete & Continuous Perception Networks

Unit 4: Limitations of the Perception Models

BLOCK 4: ASSOCIATIVE MEMORIES

Unit 1: Multilayer Feed Forward Neural Networks

Unit 2: Pattern Mathematics

Unit 3: BAM Training Algorithm

Unit 4: Storage & Recall Algorithm

BLOCK 5: CLASSICAL & FUZZY SETS

Unit 1: Introduction to Classical Sets

Unit 2: Fuzzy Logic System Components

Unit 3: Neural Network Applications

Unit 4: Fuzzy Logic Applications

REFERENCE BOOKS:-

1. S. Rajasekharan and G. A. Vijayalakshmi pai, “Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications”, PHI Publication, 2004.
2. John Yen and Reza Langan, “Fuzzy Logic: Intelligence, Control and Information”, Pearson Education, 2004.
3. Simon Haykin, “Neural Networks- A comprehensive foundation”, Pearson Education, 2001.
4. S.N.Sivanandam, S.Sumathi,S. N. Deepa “Introduction to Neural Networks using MATLAB .0”, TMH, 2006.
5. James A Freeman and Davis Skapura, Neural Networks Pearson Education, 2002.
6. Timothy J. Ross, “ Fuzzy Logic With Engineering Applications”, McGraw-Hill Inc. 1997
7. Jacek M. Zurada, Introduction to Artificial Neural Systems, PWS Publishing Company, 1995.
8. Neural networks A comprehensive foundations, Simon Hhaykin, Pearson Education 2nd edition 2004
9. Artifical neural networks - B.Vegnanarayana Prentice Halll of India P Ltd 2005
10. Neural networks in Computer intelligence, Li Min Fu TMH 2003
11. Neural networks James A Freeman David M S kapura pearson education

SUBJECT CODE: MTC-E3

SUBJECT: DIGITAL IMAGE PROCESSING

BLOCK 1: DIGITAL IMAGE FUNDAMENTALS & TRANSFORMS

Unit 1: Elements of Visual Perception

Unit 2: Introduction to Fourier Transforms & DFT

Unit 3: FFT

Unit 4: Different Types of Image Transforms

Block 2: IMAGE ENHANCEMENT TECHNIQUES

Unit1: Spatial Domain Methods

Unit 2: Histogram Equalization

Unit 3: Image Averaging

Unit 4: Frequency Domain

BLOCK 3: IMAGE RESTORATION

Unit 1: Model of Image Degradation/Restoration Process

Unit 2: Filtering Types

Unit 3: Blind Image Restoration

Unit 4: Pseudo Inverse & Singular Value Decomposition

BLOCK 4 IMAGE COMPRESSIONS

Unit 1: Lossless Compression

Unit 2: Bit Plane Coding- Predictive Coding-Dpcm.

Unit 3: Lossy Compression: Transform Coding – Wavelet Coding

Unit 4: Basics of Image Compression Standards

BLOCK 5 IMAGE SEGMENTATION AND REPRESENTATION

Unit 1: Edge Detection

Unit 2: Boundary Representation: Chain Codes

Unit 3: Boundary Descriptors

Unit 4: Simple Descriptors&Texture

REFERENCE BOOKS:-

1. William K Pratt, Digital Image Processing John Willey (2001)
2. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Learniy (1999).
3. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing.
4. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000
5. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
6. Digital Image Processing by R. C. Gonzalez and R. E. Woods
7. Digital Image Processing – Gonzalez and Woods ,Pearson Education using Matlab Publication
8. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
9. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
10. Digital Image Processing using Matlab, Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
11. Digital Image Processing, William K. Prat, Wily Third Edition

SUBJECT CODE: MTC-E4

SUBJECT: DATA MINING & WAREHOUSING

BLOCK 1: INTRODUCTION

Unit 1: Fundamentals of data mining

Unit 2: Data Mining Functionalities& Classification of Data Mining systems

Unit 3: Major issues in Data Mining

Unit 4: Data Warehouse Architecture& Data Warehouse Implementation

BLOCK 2: DATA PREPROCESSING

Unit 1: Needs Preprocessing the Data, Data Cleaning

Unit 2: Data Integration and Transformation

Unit 3: Data Reduction, Discretization and Concept Hierarchy Generation

Unit 4: Online Data Storage

BLOCK 3: DATA MINING PRIMITIVES, LANGUAGES, AND SYSTEM ARCHITECTURES

Unit 1: Data Mining Primitives

Unit 2: Data Mining Query Languages

Unit 3: Designing Graphical User Interfaces Based on a Data Mining

Unit 4: Query Language Architectures of Data Mining Systems

BLOCK 4 : CONCEPTS DESCRIPTION

Unit 1: Characterization and Comparison

Unit 2: Data Generalization and Summarization

Unit 3: Analysis of Attribute Relevance, Mining Class Comparisons

Unit 4: Discriminating between Different Classes, Mining Descriptive

BLOCK 5: CLUSTER ANALYSIS INTRODUCTION

Unit 1: Types of Data in Cluster Analysis

Unit 2: A Categorization of Major Clustering Methods

Unit 3: Mining Complex Types of Data

Unit 4: Mining Multimedia Databases, Mining Time-Series and Sequence Data

REFERENCE BOOKS:-

1. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY.
Pearson Edn Asia.
2. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT
EDITION
3. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT
EDITION
4. Data Mining Introductory and advanced topics –MARGARET H DUNHAM,
PEARSON EDUCATION
5. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE
KAMBER Harcourt India.
6. Data Mining Techniques – ARUN K PUJARI, University Press
7. Building the DataWarehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd..
8. Jiawei Han, Micheline Kamber, "Data Mining Concepts and Techniques", Morgan
Kaufmann Publishers, 2002.
9. Alex Berson, Stephen J Smith, "Data Warehousing, Data Mining & OLAP", Tata
Mcgraw Hill, 2004.
10. Usama M. Fayyad, Gregory Piatetsky , Shapiro, Padhraí Smyth and Ramasamy
Uthurusamy, "Advances In Knowledge Discovery And Data Mining", The M.I.T
Press, 1996.
11. Ralph Kimball, "The Data Warehouse Life Cycle Toolkit", John Wiley & Sons Inc.,
1998.
12. Sean Kelly, "Data Warehousing In Action", John Wiley & Sons Inc., 1997

SUBJECT CODE: ETC-E5

SUBJECT: SOFTWARE TESTING

BLOCK 1: TESTING & SQA OVERVIEW

Unit 1: Introduction to Software

Unit 2: Introduction to Testing Process

Unit 3: Testing Approach

Unit 4: Manual Testing & its Limitation

BLOCK 2: BUILDING A SOFTWARE TESTING ENVIRONMENT

Unit 1: Building Software Testing Strategy

Unit 2: Establishing a Software Testing Methodology

Unit 3: Determining Software Testing Techniques

Unit 4: Incorporating Testing tools for test activity

BLOCK 3: ELEVEN-STEP TESTING PROCESS

Unit 1: Eleven-Step Software Testing Process Overview

Unit 2: Develop Test Plan

Unit 3: Testing Software Installation

Unit 4: Evaluate Test Effectiveness

BLOCK 4: TESTING SPECIALIZATION SYSTEM APPLICATION & BUILDING TEST DOCUMENTS

Unit 1: Testing Client/Server System

Unit 2: Testing Web Based System

Unit 3: Testing off-the Shelf Software

Unit 4: Testing Security & Documentation

BLOCK 5: SOFTWARE TESTING TOOLS

Unit 1: Software Testing Overview

Unit 2: Application Testing Using Robot

Unit 3: Java Program Testing Using JMETER

Unit 4: Using “Test Director” for test Case Management, Test Process Management

REFERENCE BOOKS:-

1. William Perry, Effective methods for Software Testing, 2nd edition, John Wiley Sons, 2000 (For 2nd unit – Chapter 2 to 4; 3rd unit – Chapter 6 to 17; 4th unit – Chapter 18, 19, 20, 21, 22, 26)
2. Dr.K.V.K.K. Prasad, Software testing tools, Dreamtech press, 2004 (For 1st unit – Chapter 1 and 2; 5th unit – Chapter 3 to 9).
3. Boris Bezier, Software Testing Techniques, Dream Tech Press, 2003.
4. Marine L.Hutcheson, Software Testing Fundamentals, Dreamtech Press, 2003.
5. Software Engineering R. Pressmen – 6th Ed
6. Software Engineering Somerville
7. Introducing Software Testing Louise Tamers
8. Effective Methods for software Testing William Perry
9. Software Testing in Real World Edward Kit
10. Software Testing Techniques Boris Bezier
11. Software quality assurance: Principles and Practices by Nina Godbole, Arose Publishing

SUBJECT CODE: ETC-E6

SUBJECT: SOFTWARE PROJECT MANAGEMENT

BLOCK 1: BASIC CONCEPTS

Unit 1: Process & Project

Unit 2: Definition; Product & Process Life Cycle Models

Unit 3: Process Models

Unit 4: CMM, PCMM, ISO-9001 Applied to Software

BLOCK 2: UMBRELLA ACTIVITIES IN PROJECTS

Unit 1: Metrics in Software Management

Unit 2: Software Configuration Management

Unit 3: SQA

Unit 4: Verification & Validation Activities in each Phase

BLOCK 3: PROJECT MANAGEMENT PROCESS & ACTIVITY

Unit 1: Project Planning & Tracking

Unit 2: Process Database Interface

Unit 3: Project Initiation

Unit 4: Project Closure

BLOCK 4: ENGINEERING ACTIVITIES IN PROJECT MANAGEMENT-PHASE-I

Unit 1: Requirement Gathering

Unit 2: Estimation

Unit 3: COCOMO

Unit 4: Metrics for Estimation Process

BLOCK 5: ENGINEERING ACTIVITIES IN PROJECT MANAGEMENT-PHASE-II

Unit 1: Design & Development Phase Activity

Unit 2: Testing Phase Activity

Unit 3: Maintenance Phase Activity

Unit 4: Special Consider in Project Management

REFERENCE BOOKS:

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2. Walker Royce, Software Project Management, Pearson Education, 2004.
3. Kemerer, Software Project Management – Readings and cases, Irwin / McGraw Hill, 1997.
4. Jim McCarthy, Dynamics of Software development, WP publishers, 2001 (Indian imprint).
5. Ramesh Gopalswamy, "Managing Global Projects", Tata McGraw Hill, 2001
6. Bob Hughes and Mike Cotterell - Software project management - second edition - McGraw Hill
7. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
8. Software Project Management, Joel Henry, Pearson Education.
9. Software Project Management by Edwin Bennatan
10. Software Engineering by Roger S Pressman
11. Software Engineering by Martin L Shooman
12. TQM for Computer Software by Dunn and Ullma
13. Management of Information Technology by Pravin Mulay.
14. Software Project Management in Practice by Pankaj Jalote
15. Software Project Management A concise study by S A Kelkar