ADVANCED MATHEMATICS
MCIT-101

Unit 1 : Partial Differential Equation
Solution of Partial Differential Equation (PDE) by separation of variable method, Numerical solution of PDE (Laplace, Poisson's, Parabola) using finite difference Methods.

Unit 2 : Matrices And Linear System Of Equations
Solution of linear simultaneous equations by Gaussian elimination and its modification, Crout's triangularization method, Iterative methods-Jacobins method, Gauss-Seidal method, Determination of Eigen values by iteration.

Unit 5 : Calculus Of Variations
Euler-Lagrange's differential equation, The Brachistochrone problems and other applications. Isoperi-metric problem, Hamilton's Principle and Lagrange's Equation, Rayleigh-Ritz method, Galerkin method.

Unit 4 : Fuzzy Logic
Operations of fuzzy sets, fuzzy arithmetic & relations, fuzzy relation equations, fuzzy logics. MATLAB introduction, programming in MATLAB scripts, functions and their application.

Unit 5 : Reliability
Introduction and definition of reliability, derivation of reliability functions, Failure rate, Hazard rate, mean time t future & their relations, concepts of fault tolerant analysis.

Reference Books:
1. Higher Engineering Mathematics - by Dr. B.S. Grewal; Khanna Publishers
2. Calculus of Variations - by Elsgole; Addison Wesley.
3. Applied Numerical Methods with MATLAB by Steven C Chapra, TMH.
4. Introductory Methods of Numerical Analysis by S.S. Shastry,
5. Calculus of Variations - by Galfand & Fomin; Prentice Hall.
6. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.
7. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.
8. Numerical Solution of Differential Equation by M. K. Jain
9. Numerical Mathematical Analysis By James B. Scarborogh
10. Fuzzy Logic in Engineering by T. J. Ross
11. Fuzzy Sets Theory & its Applications by H. J. Zimmersoms

ADVANCE DATA STRUCTURES AND ALGORITHMS
MCIT-102

UNIT-I
Introduction:- : Basic Terminology, Data types and its classification, Algorithm complexity notations like big Oh, Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices, Storage pools, Garbage collection.

UNIT-II
Re cursion:- Recursion-definition and processes, simulating recursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion. Tower of Hanoi Problem.

Line ar Data Structure : - Stack, Array Implementation of stack, Linked Representation of Stack, Application of stack, Queue, Array and linked implementation of queues, Circular queues, D-queues and Priority Queues.

UNIT-III
Introduction of Linked list, Implementation of Singly Linked List, Two-way Header List, Doubly linked list, Linked List in Array. Generalized linked list,
Non Line ar Data Structure : - Trees: Basic terminology, Binary Trees, , algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees, Binary Search Tree (BST), Height-balanced and weight-balanced trees, B-trees, B+ -trees.

UNIT-IV
Se arching, Sorting And De sign Te chnique s : - Searching Techniques, Sorting- Internal Sorting, Bubble Sort, Insertion Sort, Quick Sort, Heap Sort, Bin Sort, Radix Sort, External Sorting, Merge Sort, Multi-way Merge Sort, Design Techniques - Divide and Conquer, Dynamic Programming, Greedy Algorithm, Backtracking, Local Search Algorithms.

UNIT-V
Me mory Manage me nt: - Issues - Managing Equal Sized Blocks, Garbage Collection Algorithms for Equal Sized Blocks, Storage Allocation for Objects with Mixed Sizes ,Buddy Systems , Garbage collection and compaction.

REFERENCES:

1. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education P
2. Lipschutz; Data structure (Schaum); TMH
3. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002

ADVANCED COMPUTER ARCHITECTURE
MCIT-103

UNIT-I
Basic functional blocks of a computer: CPU, memory, input-output subsystems, control unit. Instruction set architecture of a CPU - registers, instruction execution cycle, addressing modes, instruction set, Static interconnection networks,

Dynamic interconnection Networks: Bus Systems, Crossbar Switch, Multiport Memory, Multistage and Combining Networks.

UNIT-II
Flynn's Classification, System Attributes to Performance, Parallel computer models - Multiprocessors and multicomputers, Multivector and SIMD Computers. Data and resource dependences,Hardware and software parallelism,Program partitioning and scheduling, Grain size and latency, Control flow, data flow and Demand driven mechanisms.

UNIT-III
Linear pipeline processor, Nonlinear pipeline processor, Instruction pipeline design, Mechanisms for instruction pipelining, pipeline hazards, Dynamic instruction scheduling - score boarding and Tomosulo's algorithm, Branch handling techniques, Arithmetic Pipeline Design, Static arithmetic pipeline, Multifunctional arithmetic pipelines. Superscaler pipeline design, Super pipeline processor design.

UNIT-IV
Cache coherence, Snoopy protocols, Directory based protocols. Message routing schemes in multicomputer network, deadlock and virtual channel. Vector Processing Principles, Vector instruction types, Vector-access memory schemes. Vector supercomputer Architecture.

UNIT- V
SIMD organization: distributed memory model and shared memory model.
Principles of Multithreading: Multithreading Issues and Solutions, Multiple-Context Processors.
Parallel Programming Models:- Shared-Variable Model, Message-Passing Model, Data Parallel model.

REFERENCES:
1. Kai Hwang, "Advanced computer architecture", TMH.
2. Hwang and Briggs, "Computer Architecture and Parallel Processing"; MGH.
3. V.Rajaranam & C.S.R.Murthy, "Parallel computer"; PHI Learnin
4. J.P.Hayes, "computer Architecture and organization"; MGH.

OBJECT ORIENTED TECHNOLOGY & UML
MCIT-104

UNIT-I

C++ preliminaries:- Tokens, Keywords, Variable, scope of variables, Data type, pointers, operators-scope resolution, member de-referencing operators, memory management operators, manipulators, type castoperators; Symbolic constants, Type compatibility, Dynamic initialization, Reference variable, Call by reference.

UNIT-II

Objects & Classes:- abstract & declaration syntax, visibility label-private, public, protected, Inline concept, Static data member & member function, Array of objects, Pointer to objects & members, Array of pointers to objects.

Functions:-

Declaration & definition, exploring arrays & strings, function overloading, const function, Passing & returning object through function, The Friend function.

UNIT-III

Constructors & Destructors:- Default constructors, default argument constructor, parameterized constructor, Copy constructor, Destructor.

Inheritance and Polymorphism:- Visibility modes, Single Inheritance, Multi-level Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance, Virtual base class, abstract class. Function Overloading, Operator overloading, overloading unary, binary, string manipulation using operators. Run time - Virtual function, pointer to object, this pointer, pure virtual function.

UNIT-IV

Object Modeling Technique (OMT):- object model, function model, relationship among models, object diagrams, state diagrams, data flow diagrams, analysis.

Object oriented Design: Overview of object design, Combination the models, Designing algorithms, design optimization, Implementation of control, Adjustment, Design of association

UNIT-V

Unified Modeling Language (UML): Class diagram sequence diagram Use case diagram, Collaboration, diagram, state, chart diagram, Activity diagram, component diagram, deployment diagram, Object oriented Database: Relational Vs .object oriented database, the architecture of object oriented database, query language for Object Oriented database.

Reference Books:

1. Rambaugh, James Michael, Blaha - "Object Oriented Modelling and Design" - Prentice Hall India/ Pearson Education
2. Jana, C++ & Object Oriented Programming, PHI
3. OOP in C++ by Lafore, Galgotia Pub.
4. Balagurusamy; Object oriented programming with C++; TMH

ADVANCED COMPUTER NETWORK
MCIT-105

UNIT- I
Introduction: Data Communication, components, data representation, data flow; **Networks**: distributed processing, network criteria, physical structures, network models, categories of network, inter connection of networks;

The Internet: brief history**,** internet today**,**

UNIT- II
Protocols &standard layers : protocols, standards, standard organization, internet standards**,**
The OSI models : layered architecture, peer to peer process, encapsulation**,**

Layers in OSI model: physical layer, data link layer, Network layer, transport layer, session layer , presentation layer , application layer.
TCP/IP protocol suite : physical and data link layers, network layer, transport layer, application layer,

UNIT-III
Addressing : physical address, logical address, port address, specific address.
Blue tooth : Architecture, blue tooth layers, Protocol stack, Frame structure ,**cellur Telephony**-frequency reuse Transmitting, receiving, roaming, **Satellite Networks** –GEO,LEO,MEO satellite.

UNIT-IV
Internetworking with TCP/IP, Basic concepts, Principles, Protocols and Architecture, Address handling Internet protocols and protocol layering. DNS, Applications: TELNET, RLOGN , FTP, TFTP, NFS, SMTP, IMAP, MIME, HTTP,STTP,DHCP, VOIP, SNMP.

UNIT-V
Introduction to Router, Configuring a Router, Interior & Exterior Routing, RIP, Distance Vector Routing, OSPF, BGP, Uni-cast, Multicast and Broadcast. Multicast routing protocols: DVMRP, MOSPF,CBT, PIM, MBONE, EIGRP, CIDR, Multicast Trees, Comparative study of IP v6 and IP v4.

REFERENCES:
1) Data communications and networking 4th edtion Behrouz A Fourzan, TMH
2) Computer networks 4th editon Andrew S Tanenbaum, Pearson
3) Computer networks, Mayank Dave, CENGAGE
4) . Internetworking with TCP/IP: Comer.