Central University of Kashmir
DEPARTMENT OF INFORMATION TECHNOLOGY

Revised Syllabi & Scheme
for
M Sc Information Technology
(Board of Studies Meeting 14-07-2014)
# Programme Structure & Syllabus for M.Sc. I.T. Programme

## Programme Structure

### First Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Title</th>
<th>Type of Course</th>
<th>Credit</th>
<th>CIA</th>
<th>Ext.</th>
<th>Total Marks</th>
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<tbody>
<tr>
<td>MITC 101</td>
<td>Introduction to Information Technology</td>
<td>C</td>
<td>4</td>
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<tr>
<td>MIT C 102</td>
<td>Introduction to Programming Language through C</td>
<td>C</td>
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<td>MIT C 103</td>
<td>Operating Systems and System Software (OS)</td>
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<td>MIT C 104</td>
<td>Data Structures and Algorithms</td>
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<td>MIT C 105</td>
<td>Basic Electronics and Communication (E&amp;C)</td>
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<td>Soft Skill Elective</td>
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<tbody>
<tr>
<td>MIT C 201</td>
<td>Computer Organization &amp; Architecture</td>
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<tr>
<td>MIT C 202</td>
<td>Data Base Management System (DBMS)</td>
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<td>MIT C 203</td>
<td>Object Oriented Programming Structures (OOPS)</td>
<td>C</td>
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<td>MIT C 204</td>
<td>Data Communication and Computer Networks</td>
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<td>MIT C 205</td>
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<td>MIT C 206</td>
<td>Lab 3 (based on OOPS)</td>
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<td>MIT C 301</td>
<td>Software Engineering</td>
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<td>Formal Languages and Automata Theory</td>
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<td>Introduction to Java</td>
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<td>Web Design and Development</td>
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<td>MIT E 30X</td>
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### Fourth Semester

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<td>MIT C 401</td>
<td>Computer Graphics</td>
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<td>Industrial Training</td>
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Notes:

C: Core  E: Elective  SS: Soft Skill  SO: Social Orientation

Elective Courses – I

1. MIT E 301: Visual Language Programming (VLP)
2. MIT E 302: Management Science
3. MIT E 303: Distributed Computing
4. MIT E 304: E-Commerce.
5. MIT E 305: Multimedia Database Systems
6. MIT E 306: Mobile Computing
7. MIT E 307: Managing Information System
8. MIT E 308: Artificial Intelligence
10. MIT E 310: Open Elective

Elective Courses – II

1. MIT E 401: Network Security
2. MIT E 402: Compiler Design
3. MIT E 403: Object Oriented Analysis and Design.
4. MIT E 404: Bioinformatics
5. MIT E 405: Pattern Recognition
7. MIT E 407: Embedded Systems
8. MIT E 408: Data Mining
10. MIT E 410: Open Elective.

Note: A Student will be required to select Electives as offered by the Department.

* Soft Skill Electives:
  1. SS-E101 - IT Skills  (Not available to M.Sc. I.T. students)
  2. SS-E102 - Communication Skills  (Not available to M.A. English students)
  3. SS-E103 - Management Skills.  (Not available to MBA students)

** Socially Oriented Electives:
  1. SO-E 201- Environment and sustainable Development.
  2. SO-E202- Disaster Management.
  3. SO-E 203-Human Rights
Detailed Syllabus

Max Marks : 60

MIT C 101 Introduction to Information Technology

Unit-I
Introduction to computers: Computer system concepts, characteristics of computer, generations and types of computer, components of computer system, Booting process, classification of digital computer system, organization of computers. Input and Output devices, Storage devices.

Unit-II

Unit-III
Network Communication: Definition, Criteria, advantages and limitations of computer networking, Communication process, Communication types, Types of computer network, Network topology, LAN and other network related protocols, OSI model, TCP/IP model, Networking Components.

Unit –IV
Network Applications- Internet: Introduction, Internet basic, Internet protocols, Internet addressing, Browser WWW, E-mail, telnet, ftp, application, benefits and limitation of internet, electronic conferencing, and teleconferencing.

Unit-V
Latest IT Trends:-e-Commerce, M-Commerce, Artificial Intelligence, Computational Intelligence, Geographic Information System (GIS), Data Mining. Role of IT in different Area - Education, Industry, Banking, Marketing, Public Services and others.

References:
1. Computer fundamentals: By V. Rajaraman; PHI
2. Fundamentals of IT: Leon and Leon; Leon Tec World
3. Fundamentals of Information Technology, Alexis Lean and Mathews Leon, Vikas Publication House, Delhi
4. Information Technology-inside and outside, Cyganski, Pearson Publication
5. Introduction to computer Science, ITL ESL, Pearson Education
MITC 102  Introduction to Programming Language through ‘C’

Unit-I

Basic Programming Concepts: Introduction to the basic ideas of problem solving and programming using principles of top-down modular design, Flowcharts, Compilation of a Program with examples

Unit-II

Introduction to Programming Language C: Data Types, Instruction and its Types, Storage Classes, Operators and Hierarchy of Operations, Expressions in C, Control and Repetitive Statements, break, continue, Arrays, Strings,

Unit-III

Functions: User Defined Functions and Library Functions, Local and Global Variables, Parameter Passing, Pointers, C Preprocessors, Structures, Union,

Unit- IV


Unit V

Graphics Library: initgraph function, clrscr( ), Pixel Drawing, line( ), circle( ), rectangle(), closegraph(), setcolor(), setlinestyle(), setfillstyle(), floodfill(), sound and motion.

References:

Unit-I

Unit-II
Inter process synchronization and communication: need, Mutual exclusion, semaphore and hardware support for mutual exclusion, queuing implementation, and classical problem in concurrent programming, critical region and conditional critical region, Monitors, Messages, Deadlock

Unit-III

Unit-IV

Unit-V

References:
2. Modern operating Systems, A S Tanenbaum, , PHI.
5. System Software, Dhamdhare, , TMH.
Unit I

Basics: Basic terminologies; introduction to basic data Structures: Arrays, linked list, trees, stack, queue, Graph;
Data structure operations; Algorithm complexity: definition, types and notations.

Unit II

Stacks, Queues and Recursion: Stacks; Array representation of stack; Linked representation of stack; Various
polish notation PREFIX, Postfix, infix; Evaluation of a postfix & Prefix expression; Conversion from one another;
Application of stack; Recursion; Towers of Hanoi; Implementation of recursive procedures by stacks; Queues;
Linked representation of queues; Dequeues; Circular queue; Priority queue; Singly Linked list- Operation on it;
Doubly linked list- Operation on it; Circular linked list.

Unit III

Trees: Binary trees; Representation of binary tree in memory; Traversing binary tree; Traversing using stack;
Header nodes; Binary search trees; Searching and inserting in binary search trees; Deleting in a binary search tree;
AVL search trees; Insertion and deletion in binary search trees; B trees: searching, insertion, deletion; Heap.

Unit IV

Algorithm Design techniques: Divide and Conquer (Defective Chess Board, Convex Hull), Greedy (Coin
Distribution, Huffman Code), Dynamic programming (Traveling Salesperson Problem, 0/1 Knapsack), back
Tracking(8 Queens Problem, Graph coloring). Searching algorithm: linear search, binary search; Sorting
algorithms: Bubble sort, Insertion sort, Selection sort, Quick Sort, Merge sort and Heap sort, Hashing, Hash
function.

Unit V

Graphs: Terminology & representation; Linked representation of graph; Operation on graph; Traversing a graph.
Depth First Search, BFS, Warshall algorithm, Dijkstra's algorithm, Minimum spanning tree; Kruskal & Prim's
algorithm.

References:

2. Data Structures with C++ John R. Hubbard, Schaum's Outline, Tata McGraw
3. Hill.
4. Data Structure using C, AM Tanenbaum, Y Langsam and MJ Augenstein, Prentice- Hall, India
5. Data structures, Algorithms, and Applications in Java, Sahani, McGraw Hill
Max Marks: 60

MIT C 105 Basic Electronics and Communication

Unit I Analogue Electronics

Introduction, Basic Components, semiconductors, PN junction and diode action, Rectifier: Half wave and Full wave rectifier and applications. Transistors: Brief introduction and applications in Amplifiers etc. Introduction to Linear Integrated Circuits.

Unit II Digital Electronics I

Number System, Conversion from one number system to another, Binary arithmetic and codes, Representation of Floating point, 1's, 2's complement and signed binary numbers. Logic gates, Boolean algebra and logic design, Karnaugh map method of simplification of logic expressions, Flip-Flops, Latches, Registers, Shift registers, Buffers and Drivers.

Unit III Digital Electronic II

Arithmetic circuits: Half-adder, Full-Adder, n-bit adder, subtraction, Multiplication of binary number, Encoders, Decoders, Code converters, Multiplexer, De-Multiplexers, Counters analogue to digital and digital to analogue converter (ADC and DAC)

Unit IV Electronic Communication


Unit V Selected Advanced topics

Topics like very large scale integration (VLSI) circuits, optical fibre communication, communication satellites, very small aperture terminal (V-Sat) and cellular communication.

References:

1. Principles of Linear Electronics , A P Malvino , TMH Publishing Company
2. Electronics made simple , Henery Jacobowitz i Vakils, Feffer and Simons Pvt Ltd Bombay
3. Digital logic and Computer Design , M.Morris Mano , Pearson Education
5. Electronic communication systems , Wayne Tomasi , Pearson Education
6. Analogue communication A P Godse and U A Bakshi ì,Technical publications Pune
MIT C 201  Computer Organization and Architecture

Unit- I
Register transfer language, Bus and memory transfer, Arithmetic, micro operation, Logic micro operation, Shift micro operation, Arithmetic logic shift unit

Unit- II
Instruction codes, Computer registers, Computer instructions, Timing and control, Instruction cycle, Memory reference instruction, I/O and interrupt, Design of basic computer and Accumulator logic.

Unit- III
Machine language, assembly language, Assembler programming, arithmetic and logic operation, I/O programming. Micro programmed and hardwired control unit, General register organization of C.P.U, Stack organization, Instruction format, Addressing modes, Program control, RISC v/s CISC.

Unit- IV
Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipeline, RISC pipeline, Vector processing, Memory interleaving, Array processor, multiprocessor.

Unit- V
Peripheral devices, I/O interfaces, Asynchronous Data transfer DMA, Priority Interrupt, I/O processor, Multiprocessor system organization and Data communication processor. Auxiliary memory, Microcomputer, memory, Memory hierarchy, Associative memory, Virtual memory, Cache memory, Memory management hardware.

References:
1. Morris Mano “computer System Architecture”,
2. Computer Organization & Architecture, W. Stallings, PHI.
4. Computer Architecture, A Quantitative Approach, John L. Hennessy & David A. Patterson, Morgan Kaufmann,
Unit- I
Overview of Database Management: Data processing versus data management, File oriented approach versus database oriented approach to data management, Data independence, Database administration, DBMS architecture, Importance of data dictionary, Contents of data dictionary, Data Models and their types.

Unit-II

UNIT –III
Design Theory for Relational Database: Relational algebra and Relational calculus, Basic query optimization, SQL Queries and SQL programming. Normalization, Functional Dependencies, Decomposition of Relation schemes, Normal Forms for Relations, Multivalued and other kinds of Dependencies.

Unit-IV

UNIT-V
Database Security: Concepts of security, data tampering and thefts, Risks. Data security requirements. Protecting data by granting and revoking privileges, Encryption techniques and user authentication
Selected advanced topics:
I Data mining and warehousing ii. Distributed databases iii. Mobile databases iv. Web database connectivity v. GIS vi. Genome data management,

References:
1. An Introduction to Database Systems, C J Dates, / Kannan, Pearson Education.
2. Database system concepts By H.Korth and A. Silberschatz ,TMH Publication
5. Introduction to Database Management System, ISRD Group, TMH
Unit-I
Principal of OOP , Procedure oriented Vs Object oriented, OOP paradigm, Features of OOP , Basic Data types Tokens, Keywords, Constant , Variables, Operator I/O statements , Structure of C++ program, Arrays, pointers, Object modelling technique (OMT)

UNIT-II
Function, Object and Class, Defining class, Abstract class ,Function prototype, Function with parameter , Passing object as a parameter, Constructor function , Types of constructor, Destructor Friend function , Friend class, Dynamic allocation operator new and delete.

UNIT-III
Polymorphism and Inheritance , Types of polymorphism, Constructor overloading , Operator overloading, Template function Template class, Types of inheritance , Private , protected and public derivation of class , Resolving ambiguity Pointer to object, This pointer , Virtual class , virtual function

UNIT-IV
Input - output and File handling I/O classes , File and stream classes , Opening and closing file Detecting end of file, String I/O, Char I/O, Object I/O, I/O with multiple object , File pointer, Disk I/O.

UNIT-V
Exception handling, Name spaces and Standard Template library (STL), Need of Exception handling, try, catch and throws keywords, defining namespace, benefit of namespace, Component of STL.

References:

Unit-I
Data Communication and Network Fundamentals:
Signal and Data, Transmission mode, Circuit, Channels, Encoding and Decoding; Digital Modulation and Demodulation Techniques ; Goal and application of Network Hardware and Software , Protocol hierarchies, Design Issue of the layers, Interfaces and services, Service Primitives. Connection oriented and connection less services; Types of computer Network :LAN,MAN,WAN,Reference Models ï The OSI Reference model, The TCP/IP Reference Model, Topologies, Physical Layer: Transmission Media: Guided and Unguided media; Multiplexing (FDM, TDM, CDM, WDM) and Spreading (DS, FH); Switching; Communication Satellites ï Geosynchronous Satellite ï VSAT, Low Orbit Satellites, ISDN and ATM.

Unit-II
Data Link Layer: Data Link Layer design issues, Framing, Flow control, Error Detection and Correction; DLL Protocol: Stop and Wait Protocol, Sliding window protocol, A Simplex protocol for noisy channel, HDLC, PPP Medium access sub layer; Channel allocation ï static and dynamic; Random Access: Aloha and Slotted Aloha, CSMA, CSMA/CA, CSMA/CD Controlled Mutliple Access: Reservation, Polling, Token Passing, Channelized Multiple Access Techniques (FDMA, TDMA, CDMA); LAN: Topologies and Protocols; IEEE 802 Standard, Ethernet (Standard, Fast, Gigabit), Token Ring, FDDI; Connecting LANs: Repeaters, Bridges, Switches, Routers, Virtual LANs, ISDN, ATM

Unit-III
Network Layer: The Network Layer Design Issue, comparison of virtual circuits and datagram subnets, connectionless internetworking,Internet Protocol (IP): IPv4, Addressing, Subnets;, ARP, RARP, DHCP, ICMP,NAT; IPv6, Transition from IPv4 to IPv6 Routing concepts (Forwarding Function, Filtering Function); Routing Methods (Static and dynamic routing, Distributed Routing, Hierarchial Routing); Distance Vector Protocol, Link State Protocol, Open Shortest Path First (OSPF);

Unit-IV
Transport Layer: The Transport layer services, The concept of client and server in terms of socket addressing, Quality, of service, Transport service primitives and buffering, Multiplexing, Crash Recovery. The Internet Transport Protocols (TCP/IP) ï The TCP Service Model, The TCP protocol, The TCP segment header, TCP connection management, TCP transmission policy, TCP congestion control, TCP timer management ,UDP, SCTP.

Unit-V
Presentation and Application Layer: Client/Server Model, Network File System (NFS), Remote Login: Telnet; File Transfer Protocol (FTP); E-mail System: Simple Mail Transfer Protocol (SMTP), Post Office Protocol (POP); World Wide Web (WWW), Domain Name System (DNS), DNS Servers;Hyper Text Tranfer Protocol (HTTP)

References:
1. Computer Networks ,A.S. Tanenbaum, Pearson Education
2. DataCommunications and Networking ,Forouzan, Tata McGraw Hill Company
4. Data and computer Communication ,Shashibanazal ,Firewall media
5. Data & Computer communication, William Stallings, Pearson
Unit-I


Unit-II


Unit-III


Unit-IV


Unit-V

Black Box & White Box Testing (Test Case Design Techniques): Functional Testing (Black Box), Equivalence partitioning, BVA, Decision table based testing, Cause-Effect graphing, Syntax testing (Concept & Test case generation only), Structural Testing (White Box), Coverage testing, Statement coverage, Branch & decision coverage, Path coverage, Validation testing Activities, Low level testing, High level testing, Black box Vs. White Box

References:

2. An Integrated Approach To software Engineering, PankajJolote, Narosa
MIT C 302  Formal Languages and Automata Theory

Unit- I

Introduction to theory of computation: Significance of theoretical computer science, Mathematical model of computer and programming languages, Automata, historical aspect of automata, application of Automata theory. Mathematical preliminaries & Notation: Sets, Cartesian product (cross product of two sets), various operations on sets, Relation and Functions, Graphs and Trees.

Unit- II

Basics of Languages: Informal & formal definitions. Alphabets, Strings, Languages, Grammar, automata and other related definitions, various operation on languages: - union, concatenation, negation, reverse, star closure, Positive closure properties. Grammar: Informal and formal definitions. Illustrations for generating grammar for various languages

Unit- III

Finite Automata: Components of Automata, types of Automata, Deterministic Automata, Non-Deterministic Automata, Representation of Finite Automata, Deterministic Finite Automata (DFA), Representation of Deterministic Finite Automata using Transition Graphs, Transition digraphs, Transition Tables, Languages generated by Deterministic Automata.

Unit- IV

Regular Languages: Definition of Regular Languages, Application of Finite Automata, Non-Deterministic Finite Automata (NFA): Definition of Non-Deterministic Automata, Properties of Transitive function, $\varepsilon$NFA, Conversion of NFA to DFA, Finite Automata with $\varepsilon$ transition, $\varepsilon$Closure, $\varepsilon$NFA. Regular Expression : Formal Definition of Regular Expression, Languages Associated with Regular Language. Relationship between Regular Expression and Regular Language. Conversion of Regular Expression to $\varepsilon$NFA, Conversion of Finite Automata (DFA or NFA) to Regular Expression (Kleen$\varepsilon$Theorem).

Unit- V


References:

1. Introduction to Automata Theory, Languages and Computation, J. E. Hopcroft and J. D. Ullman and Rajeev Motwani: Pearson Education Asia
4. Introduction Formal Languages and Automata, Peter Linz, Narosa
MIT C 303 Introduction to JAVA

Unit-I

Overview of JAVA: The genesis of java, An overview of java, java virtual machine (JVM) ,Java development kit(JDK) ,Java Vs C++, Data types, Literals, Variables, and Arrays, Operators, Control statements, Introducing Class, closer look at Methods and class, Nested and inner class, String handling, Constructor, Garbage collection and finalize() method.

Unit-II


Unit-III

Exception handling and Using try and catch, multiple catch classes, Nested try statements, throw throws and finally, Built in exception, Uncaught exception, Creating own exception class, Multithreading: Java Thread Model, Main thread, Creating own Thread, Life cycle of thread, Thread priorities, Synchronization and messaging, communication, Suspending, Resuming and stopping thread.

Unit-IV

Input Output: Byte stream and character stream, Predefined stream, reading console input, writing console output, Print Writer class, Reading and writing files

Unit- V

Applet, AWT and Event handling— Applet life cycle, Creating an applet, Using image and sound in applet, passing parameter. AWT- Overview of java.awt package, Component and Containers, control component and layout manager Event handling— The delegation-event model, Event classes, Source of event, Event listener interfaces, handling mouse and keyboard event, Adapter class.

References:

2. Simply JAVA: An Introduction to JAVA programming, James R. Levenick, Firewall Media Publication New, Delhi
5. Core Java, Horstmen, Pearson.
UNIT-I:


UNIT II

Client side Vs Server side Technology, Java Script and CSS: introduction to DHTML, XHTML, Creating CSS, applying CSS to HTML documents, CSS Rules, Classes, CSS types. Java Script (Constants, Variables and datatypes, Operators, Window Object, document object and string function). Event Handling & Form Validation: onClick, onChange, onLoad, onSelect, onSubmit, onMouseOver, onFocus, onBlur, Validation of text box entries, checkboxes, radio buttons, e-mail address validation, date validation.

UNIT III


UNIT-IV

Creating WEB Application: ASP.NET Tools, Advanced Tools & Features, User Interface, Creating Master Pages, Creating Web Pages, User Controls, Data Binding Controls (Data List, Grid View and Data Repeater), Validation Server Controls, Web Config, Cookies, Query String, and Session State.

UNIT-V:

Data Access with ADO.Net: Database Access Using Wizard, Database Access Using Code, DataProvider, OLEDB, ODBC, Connection Object, Command Object (ExecuteNonQuery, ExecuteQuery, Execute scalar), DataReader, Understanding the role of Dataset, Data Adapter, creating connections, connecting to Database, closing an open connection, Executing SQL statements with connection object. Creating, inserting, updating, deleting database table.

References:
1. HTML 4.0, E. Stephen Mac, J. Platt, bpb
2. Completer Reference HTML - Thomas A. Powell, TMH
3. ASP.NET 4 Unleashed, Stephen Walther, Kevin Scott Hoffman, Nate Scott Dudek, Sams Publishing
Unit -I

UNIT –II

UNIT –III
Geometric Transformation: Homogeneous Coordinate System for 2D and 3D, Various 2D, 3D Transformation matrices (Translation, Scaling, Rotation, Shear), Rotation about an arbitrary point (2D), Rotation about an arbitrary axis (3D), Computing location of V.P, Clipping Algorithms, Sutherland-Cohen Clipping Algorithm.

UNIT-IV

UNIT –V
Illumination Model and Surface Rendering: Basic Illumination models, shading models for curve surfaces, Half tone Pattern and Dithering Techniques, Rendering, Color Models: XYZ Color Model, RGB, YIQ, CMY, HSV, HLS.

References:
Electives

MIT E 301 Visual Language Programming

Max Marks : 60

Unit I


Unit II


Unit III

Menu and Dialog controls in VB.Net, Menu bar implementation In VB.Net, OpenFileDialog, SaveFileDialog, ColorDialog, Font Dialog, Input and Output Using Stream Reader and stream Writer.

Unit IV

Common Controls and Application Development in VB.Net, Performing File input / output operations, implementing Multi threading, Exception Handling.

Unit V


References:
Unit-1:
Introduction to Management:
Management process, Functions of management, Evolution of Management- Classical, Neo-Classical and contemporary theories of Management. Taylor's scientific management, Fayol’s principles of management

Unit –II:
Human Resource Management:
Concepts of HRM, Functions of HRM-managerial and operative. Training and development training methods (on- job and off- job), Difference between training and development. Recruitment and selections Sources, Merits and demerits and process. Theories of motivation-Maslow need hierarchical theory, Herzberg two factor theory, Vroom expectancy theory, equity theory.

Unit –III:
Designing organization structures:
Departmentation, Centralization and decentralization. Organization structures- line organization, line and staff organization, functional organization, Committee organization, cellular organization, team structure- merits and demerits

Unit –IV:
Operations Management:
Meaning of operations management, difference between production and operations, evolution of operations management Principles and types of plant layout Statistical quality control (X-chart, R-chart, c-chart- simple problems) Inventory control EOQ, ABC analysis. Purchase procedure, stores management and stores records.

Unit-V:
Marketing:
Meaning, Functions of marketing. Marketing Mix, Marketing philosophies, Marketing Strategies based on product life cycle, Channels of distribution vertical and horizontal marketing channels, Pricing Strategies for products. Promotion mix- advertising, sales promotion, public relations, personal selling.

Suggested Readings:
2. Organizational Behavior By Stephen Robins- Pearson Education New Delhi
4. Kotler, Philip, keller, Kevin Lane, Koshy, Abraham and Jha, Mithileshwar, Marketing Management A South Asian perspective, Dorling Kindersley (India) Pvt. Ltd., New Delhi
5. Aswathappa, k., Human resources and personal management, Tata McGraw- Hill Publishing Company Ltd., New Delhi
MIT E 303    Distributed Computing

Unit-I


Unit II

Group Communication: Unicasting versus multicasting, Multicast API, Connectionless versus connection oriented Multicast Reliable multicast versus unreliable multicast API, Reliable multicast API, Ordering and their implementation: Absolute, causal, Consistant Distributed Computing Paradigms, Client-server paradigm, Peer to Peer paradigm, Message system paradigm Remote Procedure call model, Network services Paradigm.

Unit-III

Remote Procedure Calls (RPC): Introduction, RPC model its transparency, implementation, stub generation, RPC messages, Marshalling Arguments and result, server management Call semantics, Communication protocols for RPCs, Complicated RPCs, client server binding special RPCs, RPC in heterogeneous environment, Light weight RPC, Datagram Socket API, Stream mode Socket API, sockets with non blocking I/O Operations Secure Socket API Client server paradigm issues, software engineering issues for a network service, Connection Oriented and connectionless Servers Iterative servers and concurrent server, stateful servers

Unit IV

Synchronization: Mutual exclusion, deadlock, election algorithm, Resource Management: Introduction, desirable features of a good global scheduling algorithm, task assignment approach, load balancing approach, Load sharing approach; Process management: introduction, Process migration, threads

Unit V

Distributed file system: introduction, desirable features of a good DFS, file models, File accessing models, file sharing semantics, file caching semantics, file replication, fault tolerance, atomic transaction, design principles, Distributed object: Message passing versus distributed objects, distributed object architecture, distributed object system, RPC, remote method invocation, RMI architecture API for RMI, RMI application, comparison of RMI and socket API, Client Call back, Stubdownloading, RMI security manager

References:

1. Distributed Computing Principles and Application, M.L.Liu, Pearson Education
2. Distributed Computing: Concepts and Application, M.L Liu, Addison Wesley
3. Distributed Operating system, Pradeep k Singha, PHI
4. Distributed System Concepts and design, Coulouris, Pearson education
5. Distributed System, Principles and paradigm, Tanenbaum, PHI
MIT E 304  E-Commerce

Unit I


Unit II

The Internet and WWW, Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.), Types of Network, Internet Service Provider, World Wide Web

Unit III


Unit IV

Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature, Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model. Electronic Payment System: Introduction,

Unit V

Electronic Payment System: Types of Electronic Payment System, Payment Type, Traditional Payment, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash, E-similar Governance for India: E- similar Governance of India, Indian customer EDI System, Imports, Exports

References:

2. E-Commerce Technology and Management, Kamlesh K Bajaj and Debjani Nag, McGraw Hill
3. Electronic commerce: - Gray P. Schneider, Wiley
Unit-I

Introduction To Multimedia Databases: Types of multimedia information, multimedia database applications, characteristics of multimedia object, components of a multimedia database management system.

Unit-II


Unit-III

Multimedia Information Modeling: Data analysis, data structuring and accessing, examples of multimedia Structures, Metadata for multimedia, multimedia data access, object-oriented models, temporal models, models and multimedia authoring, relevant data structures (k-D trees, point quadtrees, the MX-quadtree, r-trees, etc.).

Unit-IV

Querying Multimedia Databases: Operations on multimedia data, Query processing and query languages.

Unit-V

MultiMediaDBMS (MMDBMS) Architecture: Distributed MMDBMS architecture, client-server components, implementation considerations, creating Distributed Multimedia Presentations.

References:

UNIT – I

Introduction to Personal Communications Services (PCS): PCS Architecture, Mobility management, Networks signalling. Global System for Mobile Communication (GSM) system overview: GSM Architecture, Mobility management, Network signalling, Performance Analysis: Admission control and handoffs.

UNIT – II

2.5/3G Mobile Wireless systems: packet switched Data, Introduction, 3G CDMA cellular standards, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G. 2.5/3G TDMA: General Packet Radio Services (GRPS) and EDGE.

UNIT – III

Access Scheduling techniques in cellular systems Slotted Aloha access, integrated access: voice and data, scheduling in packet based cellular systems. Mobile Data Communication: WLANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.

UNIT – IV


Unit- V

Wireless Local Loop (WLL): Introduction to WLL Architecture, wireless Local Loop Technologies. Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems.

References

MIT E 307 Management Information System

Unit I


Unit II


Unit III


Unit IV


Unit V


Text Books:

MIT E 308  Artificial Intelligence

Unit-I

Introduction, AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, and problem formulation.

Unit-II


Unit-III


Unit-IV

Planning: Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state space search, Forward states space search, Backward states space search, Heuristics for stats space search. Planning search, planning with state space search, partial order planning Graphs.

Unit-V

Learning :Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, learning with complex data, learning with Hidden variables The EM Algorithm, Instance Based learning, Neural Networks.

References :

1. Introduction to Artificial Intelligence Ḥ RajendraAkerkar, PHI.
4. Artificial Intelligence and Expert Systems Ḥ Patterson PHI
Objective
To make the students able to participate in the planning and implementation of advanced enterprise wide systems and technologies in their career.

Unit I
Enterprise Resources Planning: Evolution of ERP-MRP and MRP-II-problems of system islands -need for system integration and interface-early ERP Packages-ERP products and Market opportunities and problems in ERP selection and implementation.

Unit II
ERP implementation: Identifying ERP benefits team formation-consultant intervention-selection ERP-process of ERP implementation -Managing changes in IT organization -Preparing IT infrastructure -Measuring benefits of ERP.

Unit III

Unit IV
Supply chain Management: The concept of value chain differentiation between ERP & SCM -SCM for customer focus -need and specificity of SCM -SCM scenario in India -products and markets of Sehl -issues in selection and implementation of SCM solutions -CRM solutions; E-business: Introduction to 1 -Net technologies.

Unit V

Suggested Readings
2. Leon, Alexix Countdown 2000, Tata MC Graw
MIT E 401  Network Security

UNIT-I:

UNIT-II:
Access Control Models, Bell-LaPadula, Biba Integrity Model, Role Base Model. Cryptography: Secret Key and Public Key Cryptosystems: Cryptanalysis and attacks Symmetric Ciphers, Block Ciphers and Stream Ciphers: DES, Triple DES, RC4 and RC5, Cryptographic Modes, RSA, Diffie Hellman key exchange Message Authentication: MD5 and SHA 512 Public Key Infrastructure (PKI): Digital Certificates, Certificate Authorities

UNIT-III:

UNIT-IV:

UNIT-V:

References:
Introduction to Compiling- Compilers-Analysis of the source program-The phases- Cousins-The grouping of phases- Compiler construction tools. The role of the lexical analyzer- Input buffering-Specification of tokens- Recognition of tokens-A language for specifying lexical analyzer.

Syntax Analysis- The role of the parser- Context-free grammars- Writing a grammar- Topdown parsing- Bottom-up Parsing-LR parsers- Constructing an SLR(1) parsing table. Type checking, Type Systems- Specification of a simple type checker. Run-Time Environments- Source language issues- Storage organization- Storage-allocation strategies.

Intermediate languages- Declarations- Assignment statements - Boolean expressions- Case statements- Backpatching- Procedure calls

Issues in the design of a code generator- The target machine- Run-time storage management- Basic blocks and flow graphs- Next-use information- A simple codegenerator- Register allocation and assignment- The dag representation of basic blocks - Generating code from DAG.


References:

3. Advanced Compiler Design & Implementation, Steven S. Muchnick, Morgan Kaufmann Publishers,
MIT E 403    Object Oriented Analysis and Design

Unit-I

Object Oriented Methodology: Object model - Elements-Class and object - Nature of object/class-Relationship among Object-Relationship among classes-Quality classes and objects - Classification-Classical categorization - Conceptual clustering - prototype theory - Analysis and design.

Unit-II


Unit-III


Unit-IV


Unit-V

UML and Programming :Domain model-specification model-System design-Detailed design-Coding.

References:

1. UML distilled-Applying the standard object modelling language, Martin Fowler, Kendall Scott,, Addison Wesley.
3. Object Oriented Analysis and design with applications, Grady Booch, ", Addison Wesley.
5. Object-Oriented Analysis and Design, John Deacon, Addison-Wesley,
MIT E 404  Bioinformatics

Unit-I
Introduction: genomes - diversity size and structure - proteins proteonomes - Information Content in Biological sequences - Production of molecular function and structure.

Unit-II
Internet resources and public data bases:databases and tools -sequence similarity searches - Alignment - Production sewer - Molecular Biology Software - blast-fasta-blosum.

Unit-III
Sequence Comparison in Biology: global alignment - local alignment - gaps Multiple slung comparison - Multiple alignment to Psychogenetic trees.

Unit-III
Maps Mapping and Sequencing :DNA mapping and sequencing problems - Mapping and genome project - Large-scale sequency and sequence assembly - shotgun sequencing.

Unit-IV
Stings And Evolutionary Trees: Ultra metric Trees and distances - Maximum parsimony - stenes trees - phylogenetic alignment.

Unit-V
SPECIAL TOPICS IN BIOINFORMATION: Molecular computing - Gene production.

References:
1. Bioinformatics : Tools and Applications ,Edwards, David; Stajich, Jason; Hansen, David (Eds.)
MIT E 405 Pattern Recognition

Unit-I

Unit-II
Statistical Pattern Recognition: Gaussian model-Supervised learning-Prametric estimation-Maximum likelihood estimation-Bayesian parameters estimation-Perception algorithm-LMSE algorithm-Problems with Bayes approach-Pattern classification by distance functions-Maximum distance pattern classifier

Unit-III
Cluster Analysis:Unsupervised learning-Clustering for Unsupervised learning and classification-C-means algorithm-Hierarchical procedures-Graph theoretic approach to pattern clustering-Validity of clustering solutions

Unit-IV
Syntactics Pattern Recognition:Elements of formal grammar-String generation as pattern description-Recognition of syntactic description- Parsing-Stochastic grammer and applillcations-Graph based structural representation

Unit-V
Feature Extension And Recent Advances:Entropy minimisation-Karhunen-Loeve transformation-Neural Network structures for pattern recognition-Unsupervised learning-self organising networks-Fuzzy pattern classifiers-Genetic algorithms-Application to pattern recognition

References:
1. Pattern Recognition and Image Analysis Richard,E.G.,Johnsonbaugh and Jost .S., Prentice Hall of India Private Ltd.
2. Pattern classification and Scene analysis: Duda R.O. and Hart P.E.,Wiley
5. Pattern Recognition:Statistical and Neural Approaches , Robert J. Schalkoff,"",John Wesley
Unit- I


Unit-II


Unit-III

Neural Computing: Neuronmodeling - learning in simple neuron - Perception learning curve - Proof - Limitations of perception

Unit-IV


Unit-V


References:

3. An Introduction to Genetic Algorithms, Melanie Mitchell, PHI.
MIT E 407 Embedded Systems

Unit-I


Unit-II

Microcontroller:- Introduction, criteria for choosing a microcontroller, Overview of 8051 Microcontroller family: Architecture, basic assembly language programming concepts, Memory Organization of 8051, SFR, Addressing Modes, Instruction set including bit manipulating instruction and programming using it, Subroutine, Stack, Time delay generations and calculations, I/O port programming, Programming of 8051 Timers, Counter Programming, Watch Dog Timer, Real Time clock.

Unit-III

8051 hardware connections, basics of Communication with 8051, Basics of Communication, Overview of RS-232, I²C Bus, UART, USB, 8051 connections to RS-232, 8051 serial communication programming, 8051 interrupts, Programming of timer interrupts, Programming of External hardware interrupts, Programming of the serial communication interrupts, Interrupt priority in the 8051

Unit-IV

Basic Concepts of Interfacing, Introduction 8051 Interfacing to an external memory and Accessing External data Memory and External Code Memory, Interfacing to LCD/Keyboard, DAC/ADC, Sensors, a Stepper Motor, Interfacing with 8255

Unit-V


References:

1. Introduction to Embedded Systems, Shibu K V, TMH.
3. The 8051 Microcontroller and Embedded Systems, M.A. Mazidi and J. G. Mazidi, PHI.
4. An Embedded Software Primer, David E. Simon, Pearson Education.
5. Embedded Systems, Raj Kamal, TMH.
MIT E 408  Data Mining

UNIT I
Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT II
Pre-processing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT III
Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT IV
Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

UNIT V
Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

References:
2. Data Mining, Pieter Adrians, DolfZantinge, Addison Wesley.
3. Data Mining with Microsoft SQL Server,Seidman, Prentice Hall of India.
Unit I:
Introduction to Information Technology:

Unit II:
Application Softwares:

Unit III:
Application Software

Unit IV:
Computer Communication and Internet:
Computer Networks: LAN, MAN, WAN, Internet, Internet Applications, WWW, Web Browsers, Electronic Mail (e-mail): Creating email account, sending messages, attaching a document; Viruses and Protection.

Unit V:
Emerging Trends in Information Technology:

Suggested Readings:
1. V. Rajaraman, Computer Fundamentals, PHI.