STUDENT KIT

Master of Computer Application

July 2012 Onwards

Devi Ahilya   Vishwavidyalaya

School of Computer Science & IT

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Scheme-July 2012 onwards

MCA - I Semester

Code	Subject	L	T	P	C
CS-4022	Computer Organization & Assembly Language Programming	3	1	2	5
CS-4205	Programming and Problem Solving Using C	3	1	4	6
CS-5511	Operating Systems	3	1	2	5
CS-4116	Discrete Structures	3	1	0	4
IC-4916	Communication Skills and Report Writing	2	1	0	3
CS-4809A	Comprehensive Viva				4
Total					**27**

MCA - II Semester

Code	Subject	L	T	P	C
CS-4209	Data Structures Using C++	3	1	2	5
CS-4405	Database Management System	3	1	4	6
CS-4305	Software Engineering	3	1	0	4
CS-4008	Computer Architecture	3	1	2	5
IC-4915	Organization and Management Concepts	2	1	0	3
CS-4809B	Comprehensive Viva				4
Total					**27**

MCA - III Semester

Code	Subject	L	T	P	C
CS-4408	Database Application and Tools	3	1	4	6
CS-5613	Computer Networks	3	1	0	4
CS-5123	Theory of Computation	3	1	0	4
CS-4211	Object Oriented Programming using JAVA	3	1	4	6
IC-4917	Accounting and Financial Systems	2	1	0	3
CS-5809A	Comprehensive Viva				4
Total					**27**

MCA - IV Semester

Code	Subject	L	T	P	C
CS-5308	IT Project Management	3	1	2	5
CS-5617	Internet & Web Technology	3	1	4	6
CS-5701	Artificial Intelligence	3	1	0	4
CS-5413	Data Mining and Warehousing	3	1	4	6
CS-5805B	Project				6
CS-1905A	English Language Lab	0	0	2	1
CS-5809B	Comprehensive Viva				4
Total					**32**

MCA - V Semester

Code	Subject	L	T	P	C
CS-5216	Design and Analysis of Algorithms	3	1	2	5
CS-6623	Mobile and Wireless Systems	3	1	0	4
CS-4409	Enterprise Resource Planning	3	1	0	4
CS-512	Compiler Design	3	1	2	5
CS-5309	Object Oriented Analysis & Design	3	1	2	5
CS-6809A	Comprehensive Viva				4
Total					**27**

MCA - VI Semester

Code	Subject	C
CS-5805C	Project	26
		26

Note: Proposed Scheme can be changed/amended/improved according to necessity and requirement.

MCA - I

CS-4022 Computer Organization and Assembly Language Programming

UNIT I
Computer Organization: Digital and Analog computers, Major components of a digital computer, Memory addressing capability of a CPU, Word length of a computer, Processing speed of a CPU, Hardware, Software and Firmware. Dumb, Smart and Intelligent terminals.
Binary Systems: Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes: BCD code, Gray Code, ASCII code, Excess 3 Code, Error detecting Code.

UNIT II
Computer Arithmetic: Binary representation of Negative Integers using 2's complement and Signed magnitude representation, Fixed point Arithmetic operations on Positive and Signed (Negative) Integers like addition, subtraction, multiplication, Booth's algorithm for multiplication, Division of positive and negative binary numbers.
Boolean Algebra and Logic Gates: Basic Definitions, Basic Theorems and properties of Boolean algebra, Boolean Functions, Digital Logic gates.

UNIT III
Gate-Level Minimization: The K-Map Method, 3 and 4 variable K-Map, Combinational Circuits, Decoders, Encoders, Multiplexers and Demultiplexers, Sequential circuits, Latches, Flip Flops: SR, D, JK, T. Master Slave JK Flip flop, Integrated Circuits.
Shift Registers- Serial in Serial out, Serial in Parallel out, Parallel in Serial out and Parallel in Parallel out. Designing of Asynchronous (Ripple) Counters, Design of Synchronous Counters.

UNIT IV
Introduction of 8085 Microprocessor: Architecture of 8085 processor. Register Architecture: Accumulator, Register and Flag Register. Program Counter, Stack pointer and Instruction register.
Addressing Modes: Direct memory addressing mode and Register direct Addressing Mode. Register Indirect Addressing Mode, Immediate Addressing Mode and Implicit or Implied Addressing Mode.

UNIT V
Introduction to Assembly Language Programming: Various Instructions Classifications: Instruction Format, Opcode, Operand and Hex code. Instruction Operation Status, Various Instruction Sets: Data Transfer Group Instructions, Arithmetic Group Instructions, Logical Group Instruction, Branch Group Instructions: Conditional , Unconditional and Machine control Instructions.

Text Book(s):
1. Microprocessor Architecture, Programming and Applications with 8085/8080 by Ramesh S. Gaonkar.
2. Digital Design by M. Morris Mano. Publication: PHI Eastern economy edition.

Reference Book(s):
1. Fundamentals of Computers by B Ram Publication : PHI , Fourth edition
2. Microprocessor and Its applications by R Theagrajan,S Dhanapal
3. Computer Architecture By Dr. Rajkamal. Publication: TMH Indian Special edition 2006.
4. Digital systems principal and Design by Dr. Rajkamal

CS-4205 Programming and Problem Solving Using C

UNIT I
Introduction to Computer based Problem Solving; Algorithms and flowcharts; Programming Languages; Classification of Programming Languages; Characteristics of a program; Rules/conventions of coding, documentation, naming convention; Structured Programming; Modular Programming; Programming Environment: Assembler, Interpreter, Compiler, Linker and Loader.

UNIT II
Fundamentals of C programming; History of C; Structure of C Program; Character set, Identifiers and Keywords; Data types; Constants and Variables; Operators and Expressions, Type Conversion, Operator Precedence and Associativity; Basic Input/Output operations; **Decision control structures :** *if-else, switch-case* ; **Loop control structure :** *while, do-while, for*; **Jump statement :** *break ,continue* ; *goto* statement.

UNIT III
Array: One dimensional array **-**Declaration, initialization of one dimensional arrays; Two dimensional array **-**Declaration, initialization of two dimensional arrays; multi-dimensional array. **Strings:** Declaring and initializing string, reading and writing strings, string manipulation functions, array of strings. **Function:** Need of user-defined function, Arguments, return value, *return* statement; passing parameters – call by value, call by reference; Scope, visibility and lifetime of variables; Nesting of functions; passing arrays to function; passing strings to function. **Recursion:** basics, comparison with iteration, types of recursion. **Storage Classes.**

UNIT IV
Pointer: Declaring and initializing pointer variables, chain of pointers, Pointer expression, Pointer arithmetic, Array of pointer and its limitations; Pointers as Function arguments; Function returning pointer, Dynamic Memory management functions.   **Structure:** Defining a Structure, Declaring & initializing Structure Variables, Membership Operator, Array in structure, Array of Structure, Structure within structure, Pointer to structure. **Union:** Defining union, Declaring & initializing union Variables; Bit Fields; **Enumerated data type; typedef; Bitwise operators**.

UNIT V
Command line arguments; File handling: Defining, opening and closing a file, input/output operations on file, merging files; **C preprocessors:** Macro substitution, file inclusion, compiler control directive.

Text Book(s):
1. Herbert Schildt, "C The Complete Reference", Osborne/McGraw-Hill,.
2. Yashavant Kanetkar, "Let us C",BPB Publications,.

Reference Book(s):
1. B.W. Kernigha, D.M. Ritchie, "The C Programming Language", Prentice Hall of India.
2. E Balagurusami, "Programming in ANSI C", Tata McGraw-Hill.
3. Byron S Gottfried, "Programming with C", Tata McGraw-Hill.
4. Yashwant Kanetkar, "Test your C skills",BPB Publication.
5. Behrouz A. Forouzan, Richard F. Gilberg, "Computer Science: A Structured Programming Approach Using C", Second Edition, Thomson Brooks/cole.

CS-4116 Discrete Structures

UNIT I

The Foundations: Logic, Sets and Functions: Introduction to set theory, mathematical logic, prepositions, prepositional equivalences, predicates and quantifiers. Importance of Quantifiers. The Foundations: Logic, Sets and Functions: Sets, set operations, fuzzy sets, functions, functions for computer science, sequences and summations.

Mathematical reasoning: Introduction to Methods of proof, mathematical induction. Use of mathematical induction to solve different problems. Importance of recursions in computer science, scope of recursions, Recursive definitions, recursive algorithms.

UNIT II

Combinatorics: The basics of counting, The sum rule, The product rule, The Pigeonhole Principle, Permutations with repetitions, Permutations without repetitions, Circular Permutations. Applications of combinations. Applications of Combinatorics to solve Committee problems, word problems, puzzle problems etc. Applications of Combinatorics to understand Telephone numbering plan, understanding Internet addresses, Advanced counting techniques, recurrence relations, solving recurrence relations, algorithm design, Basic understanding of complexities, basic problems of complexity of algorithms.

UNIT III

Relations: Relation definition , Importance of relations in computer science, Relations and their properties, Unary relations , Binary relations, Ternary relations , n-ary relations and their applications, closures of relations, equivalence relations, partial ordering. Representing relations, relation matrix, relation graph, composite relation. Operations on relations – union, intersection and join. Concepts of least upper bond, Greatest lower bond, maximal element, minimal element, Greatest element, Least element of a partially ordered set, lattices, sub lattices, chains, antichains.

UNIT IV

Graphs: Introduction to Graphs, Importance of graph theory in computer science, Graph terminology, representing graphs, graph types, graph models, and graph isomorphism. Connectivity, Euler and Hamiltonian Paths, shortest path problems, planar graphs, graph colouring, chromatic number, Euler's formula, Kuratowski's theorem. The four colour problem, Applications of Graph Colouring, Introduction to Trees, applications of trees, tree traversal, trees and sorting, Spanning trees, minimum spanning trees.

UNIT V

Languages and Grammars: Introduction to Languages and Grammars, solving problems for validity of statements according to the grammar. Importance of Language theory in Computer Science, Importance of Derivation trees, solving problems of Derivation trees, Importance of Parsing, Phrase-Structure Grammars, Types of Phrase structure grammars.

Text Book(s):
1. Kenneth H. Rosen, "Discrete Mathematics and its Applications", 5th edition, Tata McGraw-Hill Edition.

Reference Book(s):
1. Kolman, Busby & Ross, "Discrete Mathematical Structures" ,5th edition, Pearson Education
2. Narsingh Deo "Graph Theory with Applications to Engineering and Computer Science", 4th edition, Prentice Hall of India .
3. James L. Hein, "Discrete Structures, Logic and Computability", 2nd edition, Narosa Publishing House.
4. Ralph P. Grimaldi, "Discrete and Combinatorial Mathematics", 5th edition, Addison-Wesley publication.

CS- 5511 Operating Systems

UNIT I
Introduction: Definition, functions and services of operating system.
Evolution of operating systems: Early Computers and Operating Systems, Resident Monitors, Offline I/O, SPOOLing Systems, Multiprogramming, Timesharing, Interactive systems, Multi-users systems, Multiprocessor, Network and Distributed systems.
Operating system concepts: activities, functions and services system calls, system structures, kernel functions, process management concepts.

UNIT II
CPU Scheduling: concepts, scheduling criteria, scheduling algorithms, algorithm evaluation. Multithreading: Implementation, User level and Kernel level threads, Thread Scheduling.
Inter-process communication, Mutual exclusion problem and critical section. Process synchronization, Classical IPC problems: Producer Consumer problem, Dinning Philosophers problem; IPC Techniques: Synchronization hardware, semaphores, Monitors, Message passing.
Deadlock: Necessary Conditions, deadlock handling methods: Deadlock Prevention, Deadlock detection and recovery, Deadlock avoidance, Bankers Algorithm.

UNIT III
Memory Management: Concepts, single user memory management. Partition memory allocation: paging, segmentation and segmentation with paging, Virtual memory management: concept, Storage hierarchy, demand paging, process creation, page replacement, allocation of frames and thrashing.

UNIT IV
File Management: File concepts, access methods, directory structure, sharing and protection of files. File system structure and implementation, allocation methods, free space management, reliability of file system. Unix file system.

UNIT V

Device Management: Goals of input/output software design, structure of device hardware and software. layers of I/O software, structure of device drivers, disk driver, disk arm scheduling algorithms, terminal driver, clock driver etc.

Note: Case study of Windows /UNIX/Linux operating systems will be used to explain the above topics.

Text Book:
1. A. Silberschatz, P. Galvin and Gagne, *Operating System Concepts,* Addison Wesley, 6th Edition, 1994.
2. A.S.Tanenbaumb, *Modern Operating System Concepts,* Prentice Hall, 2nd Edition, 2001.

 Reference books:
1. W. Stallings, Operating systems, 4th Edition, Pearson Education, 2003.
2. M. Back, Design of Unix Operating System, Prentice Hall, 1986

IC-4916   Communication Skills

UNIT I
 Fundamentals of Communication:
 Definitions, Importance, forms of communication, process of communication, Channels, Barriers and Strategies to overcome barriers of Communication.

UNIT II
Listening:
Def, Importance, Benefits, Barriers, approaches, be a better listener, exercise and cases.
Group Discussions:
Definitions, Importance, Process, Points to be borne in mind while participating, Dos and Don'ts.

UNIT III
Presentation Skills:
Dos and Don'ts
Interviews:
Types of Interviews, Points to be borne in mind as an Interviewer or an Interviewee, Commonly asked questions, Dos and Don'ts.

UNIT IV
Transactional Analysis:
Transactional analysis, Johari Window.
Written Communication:
Report Writing, Business Correspondence, Preparation of Manuals and Project Report, Minutes of meeting, Notices and Circulars.

UNIT V
Intense Practise of Presentations, GDs and Interviews

Text Book(s):
1. Communication- KK Sinhga
2. Organizational Behavior – Fred Luthans
3. Organizational Behavior – Stephen Robbins

Reference Book(s):
1. Communications Skills- MV Rodrigues.
2. Times of India/ Hindustan Times/ The Hindu etc.

MCA - II

CS-4209 Data Structures using C++

UNIT I
Introduction to C++ & Introduction to Data Structures

C++ Basics, Structures, Variables in C++, References, Functions, Function Overloading, Default Values for Formal Arguments of Functions, Inline Functions. Introduction to Classes and Objects Constructors, destructors, friend function, dynamic memory allocation, Inheritance, Overloading, Polymorphism, Templates.

Definition of data structures and abstract data types. Static and Dynamic implementations. Examples and real life applications, Data Structures: Arrays, Address calculation in a single and multi dimensional array. Sparse matrices.

UNIT II
Stacks, Queues and Lists

Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples : Infix, postfix, prefix representation, Applications : Mathematical expression Evaluation Definition: Queues & Lists: Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority queues , Applications.

UNIT III
Trees & Graphs

Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal - preorder, post order, inorder traversal, Binary Search Trees, Implementations, Threaded trees, AVL Trees, Implementations , Balanced multi way search trees, Applications Definition of Undirected and Directed Graphs and Networks, The Array based implementation of gravbphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Connectivity of graphs; Connected components of graphs, Weighted Graphs, Applications.

UNIT IV
Running time & Searching Algorithms

Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

Straight Sequential Search, Binary Search, non –recursive Algorithms, recursive Algorithms, Indexed Sequential Search. Definition, Hash function, Collision Resolution Techniques, Hashing Applications.

UNIT V
Sorting Algorithms
Introduction, Sorting by exchange, selection, insertions, Bubble sort, Selection sort, Insertion sort, Pseudo code algorithm and their C++ implementation, Efficiency of above algorithms, Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays, The merge sort Algorithms, Quick sort Algorithm, Analysis of Quick sort, Picking a Pivot, A partitioning strategy, Heap sort, Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach, Radix sort.

Text Book(s):
1. Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub, 6th Edition.
2. How to Program C++ by Paul Deitel , Harvey Deitel, Prentice Hall; 8 edition.

Required Text(s):
1. Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH 2006,Special Indian Edition.
2. Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
3. Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW, 1st Edition.
4. Data Structures and Program Design in C By Robert Kruse, PHI, 2nd Edition.

CS-4405   Database Management System

UNIT I
Introduction and Relational Model: Advantages of DBMS approach, Various views of data, data independence, schema & sub-schema, primary concept of data models, database languages, transaction management, database administrator & user, data dictionary, database structure & architectures. Relational Model: Domains, relation, kind of relation, Relational databases, Various types of keys: candidate, primary, alternate & foreign keys, relational algebra with fundamental and extended operations, modification of database.

UNIT II
ER Model and SQL: Basic concept, design issues, mapping constraint, keys, ER diagram, weak & strong entity-sets, specialization & generalization, aggregation, inheritance, design of ER schema, Reduction of ER Schema to tables. SQL: Basic structure of SQL, Set operation, Aggregate functions, Null values, Nested Sub queries, derived relations, views, Modification of database, join relation, Domain, relation & keys, DDL in SQL. Programming concepts of PL/SQL, Stored procedure, Database connectivity with ODBC/JDBC

UNIT III

Functional Dependencies: Basic definitions, Trivial & non trivial dependencies, closure set of dependencies & of attributes, Irreducible set of dependencies, FD diagram. Normalization: Introduction to normalization, non loss decomposition, First, second and third normal forms, dependency preservation, BCNF, multivalue dependencies and fourth normal form, join dependencies and fifth normal form.

UNIT IV

Transaction Management: Basic concept, ACID properties, transaction state, Implementation of atomicity & durability, Concurrent execution, Basic idea of serializability. Concurrency & Recovery: Basic idea of concurrency control, basic idea of deadlock, Failure Classification, storage structure-types, stable storage implementation, data access, recovery & Atomicity: log based recovery, deferred database modification, immediate database modification, checkpoints.

UNIT V

Database Integrity, Storage Structure & File Organization: general idea, integrity rules, Domain rules, Attributes rules, assertion, triggers, integrity & SQL. Storage Structure: overview of physical storage media, magnetic disk: performance & optimization, RAID. File Organization: File organization, Organization of records in files, basic concept of Indexing, ordered indices: B+ tree & B tree index files.

Text Book:
1. Database System concepts – Henry F. Korth , Tata McGraw Hill 5th Edition.

Reference Book(s):
1. "Fundamentals of Database Systems", Elmasri R, Navathe S,   Addison Wesley 4th Ed.
2. An introduction to database system- Bipin C. Desai
3. An introduction to Database System - C. J. Date
4. SQL, PL/SQL The programming language of Oracle- Ivan Bayross

CS-4305 Software Engineering

UNIT I

Introduction to Software Engineering & Software Process: Software problem, Software Engineering Problem, Software Engineering Approach, Software Characteristics and Application. Software Processes: Components & Characteristics, Software Development Processes: Waterfall Model, Prototyping Model, Iterative Enhancement Model, Spiral Model, Timeboxing model, RAD Model, CBD Model, Comparative Study of Various Development Models.

UNIT II

Project Management Process & Project Planning: The People, Product, Process and Project, Phases of Project Management Process, Project Life Cycle, The W^5HH Principle. Software Configuration Management Process, Process Management Process. Metrics and Measurements, Project Estimation (size & cost), Project Scheduling, Staffing and Personnel Planning, Risk Management, Miscellaneous Plans.

UNIT III
Software Requirement Analysis and Specification: Software Requirements, Problem Analysis (Structured Analysis and Object Oriented Analysis), Requirements Specification, Validation and Verification, Metrics, Case Study.

UNIT IV
Software Design: Design principles: Problem Partitioning and Hierarchy, Abstraction, Modularity, Top-down and Bottom-up strategies, Effective Modular Design: Functional Independency, Cohesion, Coupling. Structured Design Methodology, Overview of Object-Oriented Design, Case Study.

UNIT V
Software Testing & Quality Assurance: Testing Fundamentals, Test Case Design: White Box Testing, Black Box Testing, Levels of Testing: Unit Testing, Integration Testing, System Testing and Acceptance Testing, The art of Debugging. Quality Concept, Quality Management System, Quality Assurance Activities, Quality Standards: Capability Maturity Model (CMM), ISO 9000, Six Sigma. SQA plan, Software Reliability, Best Software Engineering Practices.

Text Books:
1. An Integrated Approach to Software Engineering- Pankaj Jalote, Narosa Publishing House, third Edition, 2005.
2. Software Engineering-A practitioner's approach- R. S. Pressman, Tata McGraw-Hill International Editions, New York.

Reference Book(s):
1. Software Engineering- Ian Sommerville, Pearson Education, New Delhi.
2. Software Engineering Concepts-Richard E. Fairly, Tata McGraw Hill Inc. New York.
3. Software Engineering: Principle & Practice-W. S. Jawadekar, Tata McGraw-Hill, New York.
4. Fundamentals of Software Engineering-Rajib Mall, PHI, New Delhi, Third edition, 2011.
5. Web Resourses : www.courses.cs.vt.edu/csonline/SE/Lessons , www.rspa.com , www.sei.cmu.edu , www.acm.org

CS-4008 Computer Architecture

UNIT I
Technological trends, measuring performance, Amdahl's law. Functional units and components in computer organization: The memory unit, the input and output subsystem, the bus structures, ALU. Program development tools: Compiler, interpreter, and assembler.

UNIT II
Input/output : External Devices, I/O Modules, Programmed I/O, Interrupt driven I/O, Direct memory access, I/O Channels and processors, Direct memory access, The external interfacing, Booth multiplication, integer division, BCD arithmetic.

UNIT III
Design of ALU, concepts of instruction formats and instruction set, instruction set types, types of operands and operations. Generation of memory address and addressing modes. STACKS and QUEUS, GPR organization and stack based organizations. Encoding of machine instructions. Features of RISC and CISC processors.

UNIT IV
Processing unit design: Processor micro architecture –I, fundamentals concepts for data path implementation. Processor micro architecture-II data path implementation. Instruction pipelining, instruction pipelining hazards, data dependency hazards and control hazards, overcoming hazards. Parallel processing and pipelining, pipelining in RISC and CISC processors.

UNIT V
Super scalar processors, in order and out of order execution, instruction level parallelism, introduction to VLIW processors, vector processors. CACHES: Data caches, instruction caches and unified caches, cache implementations, fully associative and direct mapped caches, write back versus write through caches.

Text Books:
1. Computer Architecture: Scahaum's outlines by Dr. Rajkamal.
2. Microprocessor and microcomputer based system design By Mohammed Rafiquzzaman.

Reference Book(s):
1. The 8088 and 8086 Microprocessors by Walter A. Tribel, Avtar Singh.
2. Computer Organization & Architecture by William Stallings.
3. Computer Architecture & Parallel Processing, Hwang & Briggs, McGraw Hill
4. Microprocessor Archi. Prog. and app. With 8085/8080 By Ramesh S. Gaonkar
5. Computer System Architecture by Morris Mano, Pearson Education.
6. Parallel Computer Architecture: A Hardware/Software Approach, David Culler and J.P. Singh with Anoop Gupta

IC – 4915 Organization and Management Concepts

UNIT I
Introduction
Definition of Management, Management functions, Role of Managers, Principles of Management, Management Thought- Classical School, Scientific school.

UNIT II
Planning
Nature and purpose of planning, Types of planning, Steps in planning, Decision Making, Programmed and Non Programmed Decision Making.

UNIT III
Organizing and Staffing
Formal and Informal Organization, Organizational division – Departments, Bases of Departmentation, Span of Management, Line and Staff conflicts, Definition of Staffing, System Approach to Staffing, Selection Process, Performance Appraisal, Career Strategy.

UNIT IV
Motivation and Leadership
Motivation, Theories of Motivation – Maslow's Need Hierarchy Theory, McGregor's Theory X and theory Y, Herzberg's two factor Theory, Leadership, Managerial Grid.

UNIT V
Controlling
The Basic Control process, Control as feedback System, Real Time Control.

Text Book(s):
1. R. D. Agarwal- Organization and Management -Tata McGraw Hill Publishing Company Ltd.
2. Harold Koontz Heinz Weihrich – Essentials of Management - Tata McGraw Hill Publishing Company Ltd.

MCA - III

CS-4408 Database Applications and Tools

UNIT I
Database Environment: Data versus information, traditional file processing, disadvantages, database approach, range of database application, advantages of database approach. Cost and risk factors, components of database environment, evolution of database system.
Database Development Process: Information engineering, information architecture, enterprise data model, planning, SDLC, CASE etc. Steps of planning, strategic planning factors, corporate planning objects. Developing preliminary data model, and use of planning matrices, SDLC steps, CASE role, people in database development, three-schema architecture for database development. Examples to demonstrate the development process.

UNIT II
Modeling Data in the Organization: Modeling of the rules of organization, data names and definitions, ER model constructs entities and its types, attributes, relationships, degree, unary, binary, ternary, n-ary, cardinalities constraints, ER modeling examples.
Enhanced ER modeling: supertype, subtypes, specialization, generalization, specifying constraints in EER models, completeness, Disjointness, discriminators, defining super/sub type hierarchies, EER modeling examples, live demos modelling for few scenarios.

UNIT III
Logical database design: and relational model development, Relational model properties, keys, primary, secondary, composite, properties of relations. Codd's rules, integrity constraints, creating relational tables, Transform EER diagrams into relations, seven different steps for mapping EER model into relations,
UNIT IV
Introduction to normalization: steps, functional dependencies, basic normal forms, definition of first, second, third normal form and removing anomalies from the relations. De-normalization and merging relations.

UNIT V
Special Topics (Overview) : Data Warehousing, Data Mining, Distributed Databases, Object oriented modeling, definitions, activities in phases of model development, advantages of OOM, UML class diagrams, Example of a model development.

Text Book:
1. Hoffer, Prescott, "Modern Database Management", Seventh Edition, McFadden Pearson Education.

Reference Book(s):
1. Thomas M. Connolly, Carolyn E. Begg, "Database Systems", Pearson Education.
2. Raghu R and Johannes G., "Database management Systems", Mc Hill 3rd Edition, 2002.
3. Elmasri R, Navathe S, "Fundamentals of Database Systems", Addison Wesley 4th Edition.

CS-5613 Computer Networks

UNIT I
Introduction: Overview, Goal and Applications of Computer Networks; Network Hardware - LAN, MAN, WAN and topologies; LAN components – File server, Workstations, Network Adapter Cards; Network Software - Protocol hierarchies, Design issues for the layers, Connection Oriented and Connection less services, Service primitives, Relationship between Services and Protocols; Switching Techniques – Circuit Switching and Packet Switching; Reference models – OSI and TCP/IP, comparison and critique of OSI and TCP/IP reference models.

UNIT II
Data Link Layer: Design issues – Services, Framing, Error Control and Flow Control; Error Detection Techniques - Parity Check and Cyclic Redundancy Check (CRC); Error Correction Technique - Hamming code; Elementary Data Link Protocols - Unrestricted Simplex Protocol, Simplex Stop-and-Wait Protocol, Sliding Window Protocols : One-Bit Sliding Window Protocol, protocol using Go Back N and Selective Repeat; HDLC protocol; Data link layer in the Internet - SLIP and PPP.

UNIT III
Medium Access Sublayer: Channel Allocation problem; Multiple access protocols: Pure Aloha, Slotted Aloha, CSMA Protocols, CSMA/CD, Collision-Free Protocols; IEEE MAC Sublayer protocols - 802.3, 802.4, 802.5 and their management; High speed LANs – Fast Ethernet, FDDI; Wireless LANs; Data Link Layer Switching – Bridges and Switches, their difference with Repeaters, Hubs, Routers and Gateways.

UNIT IV
Network Layer: Design issues; Routing algorithms - Optimality Principle, Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcasting Routing, Multicast Routing; The Network Layer in the Internet - Internet Protocol, Internet addressing and Internet Control protocols.

UNIT V
Transport Layer: Transport Service; Elements of transport protocols - Addressing, Connection establishment, Connection release, Flow control and Buffering, Multiplexing; The Internet Transport Protocols - UDP and TCP, The TCP Service Model, The TCP Protocol.
Application layer: Client Server Architecture, DNS, WWW and HTTP, E-mail Protocols (SMTP, POP3, IMAP, MIME), FTP, TELNET.
Network Security: Cryptography, Symmetric Key Algorithms, Public key Algorithms and Digital Signatures.

Text Book(s):

1. Computer Networks, Andrew S. Tanenbaum, Addison-Wesley, 4th Ed.

Reference Book(s) :
1. Data Communications and Networking, B.A. Frouzan, McGraw-Hill.
2. Data and Computer Communications: W.Stallings, Prentice-Hall, 5th Ed., 1997.
3. Computer Networking: James F. Kurore & Keith W. Rose, Pearson Education, Third Edition, 2005.
4. Communication Networks: Fundamentals Concepts and Key Architecture: Alberto Leon-Garcia and Indra Widjaja, Tata McGraw-Hill Publishing Company Limited, ISBN 0-07-0402235-3.
5. Data and Network Communication: Michael A. Miller, Delmar Thomson Learning inc. ISBN 0-07668-1100-X.
6. Introduction to Computer Networks: Douglas E. Comer, Prentice-Hall.
7. Alberto Leon-Garcia and Indra Widjaja, Communication Networks –Fundamentals Concepts and Key Architecture, Tata McGraw-Hill Publishing Company Limited.

CS-5123 Theory of Computation

UNIT I
Theory of Automata: String, Alphabet and Languages, Finite Automata, Finite State Machine, Basic Definition. Description of a Finite Automaton, Deterministic Finite Accepters Transition Graphs, Languages, Non-deterministic Finite Acceptors- Definition, Finite Automata with ϵ-moves, Equivalence of Deterministic and Non-deterministic Finite Accepters,Conversion of NDFA to DFA, Removal of ϵ transition from ϵ – NDFA, Minimization of Finite Automata – Definition and Construction.
Mealy and Moore models Definitions, Transformation of Mealy Machine into Moore Machine and vice-versa.

UNIT II
Properties of Regular Sets: Pumping lemma for regular set, Closure properties of regular set.
Formal Language: Basic Definition, Chomsky Classification of languages, Initialization of Finite Automata Regular Expression and Language Regular Expressions, Connection between Regular Expressions and Regular Languages.

UNIT III
Regular Grammars – Right and Left Linear Grammars, Equivalence between Regular Languages and Regular Grammars.
Context-Free Grammars: Leftmost and Rightmost Derivations, Derivation Trees, Parsing and Ambiguity, Simplification of CFGs. Chomsky Normal Form, Greibach Normal Form, Cocke-Kasami- Younger Algorithm, Properties of Context-Free Languages.

UNIT IV
Pushdown Automata: Definition, Non-deterministic Pushdown Automata, Pushdown Automata for Context Free Languages Context-Free Grammars for Pushdown Automata. Deterministic Pushdown Automata and Deterministic Context-Free Languages.

UNIT V

Turing Machine: Definition of Standard Turing Machine, Turing Machine as Language Accepters and Transducers.

Text Book(s):
1. Mishra and Chandrasekaran, Theory of Computer Science (Automata, language and Computation), 2nd Ed. Prentice Hall of India.
2. J. E. Hopcroft, R. Motwani and J.D Ullman, Introduction to Theory, Languages and Computation; Second Edition, Addison-Wesley, 2001 Narosa Publishing House.

Reference Book(s):

1. Moll, Arbib and Kfoury, an Introduction to Formal Language Theory, Springer-Verlag.
2. Martin, J.C.: Introduction to Languages and the Theory of Computation, McGraw-Hill, Inc.,3rd ed., 2002. ISBN 0-072-32200-4.
3. Brookshear, J.G.: Theory of Computation: Formal Languages, Automata, andComplexity, Benjamin/Cummings Publishing Company, Inc, Redwood City, California, 1989. ISBN 0-805-30143-7.
4. Peter Linz, An Introduction to Formal Languages and Automata, Narosa

CS- 4211 Object Oriented Programming Using JAVA

UNIT I

Introduction to Java: Features of Java, Object-oriented programming overview, Introduction of Java Technologies, How to write simple Java programs, Data Types, Variables, Memory concepts, decision making operators, Naming Conventions, Introduction to Class, Objects, Methods and Instance Variables, Primitive type Vs Reference Type, Initializing Objects with Constructors. Type conversion & casting, Operators, Control Statements, break and continue Statements. Static Method, static field and Math Class, Argument Promotion and Casting, Scope of declaration and Method Overloading.

UNIT II

String Handling: The String constructors, String operators, Character Exaction, String comparison, String Buffer.
Arrays: Enhanced for Statement, Passing Arrays to Method, Multidimensional Arrays, Variable-Length Argument lists, Using Command-line Arguments. final Instance Variables, this reference, static import, overloaded Constructors, Garbage collection and method finalize , Overloading methods, Parameter passing.
Inheritance: Relationship between Superclasses and Subclasses, Using super, Constructor in Subclasses, The Object Class, Object Copying in Java. **Polymorphism:** Method overriding, upcasting, Dynamic Method Dispatch, final Method and classes, Abstract classes and Methods, instanceof operator, Downcasting, Class class, Runtime type Identification

UNIT III

Packages and Interfaces: Defining a Package, Understanding CLASSPATH, Access Protection, Importing packages, creating own packages. Defining an Interface, Properties of interface, advantages of interface Achieving multiple inheritance through interfaces, Variables in Interfaces, Comparable interface.

Exception Handling: Introduction, overview of doing it and keywords used, when to use it, Java Exception Hierarchy, finally block, chained exceptions, declaring new exception types, preconditions and postconditions. **Streams and Files:** Introduction, Data Hierarchy, Files and Streams, Sequential-access Text Files, Object Serialization, Random-Access files, Java Stream class Hierarchy.

UNIT IV

Multithreading: What are threads, The java thread model, Thread priorities, Thread life cycle, Creating thread and executing thread, Thread Synchronization, producer-consumer problem without Synchronization, Producer-consumer problem with Synchronization, Other class and Interfaces in java.util.concurrent, Monitor and Monitor Locks, Thread Groups, Synchronization, Inter-thread Communication.

Introduction To GUI : Introduction, Overview of swing Components, Introduction to Event Handling, Common GUI Event Type and Listener Interfaces, How Event Handling Works, Adapter Classes, Layout Managers **Applets:** Applet basics, Applet Architecture, Applet life cycle methods, Applet HTML Tag and attributes, Executing applet in web browser and in the appletviewer.

UNIT V

Generic and Collection API: Introduction, Motivation for Generic Methods, Generic Methods : Implementation and Compile- time Translation Issues, Overloading Generic Methods, Generic Classes, Raw Types, Generic and Inheritance **Database connectivity:** JDBC, The design of JDBC, Typical uses of JDBC, Basic JDBC Programming concepts, Executing Queries.

New Feature of Java: Java Reflection API, Auto boxing, Annotations, Regular Expressions etc.

Text Book:
1. Java 2: The Complete Reference by Herbert Schildt, Tata McGraw- Hill, 8th Edition, 2011.

Reference Book(s):
1. The Java Programming Language, Ken Arnold , James Gosling , David Holmes, 3rd Edition, Person Education, 2000.
2. Head First Java, Kathy Sierra, Bert Bates, O'Reilly Publication, 2nd Edition,2005

IC-4917 Accounting and Financial Systems

UNIT I

Introduction to Book Keeping: Meaning, Nature, development, Objectives, merits and difference between Book Keeping and Accountancy. Fundamentals of Accounting: Accounting concepts and conventions. Brief Introduction to GAAP and its importance.

UNIT II

Accounting Structure: The Process of Accounting – Journal, Ledger, Subsidiary books, Trial Balance based on Double Entry Book Keeping System.

UNIT III

Financial Systems and related concepts: Form and preparation of Income statements (P & L A/C), Statement of Financial Position. Methods of Depreciation – SLM Method and WDV method.

UNIT IV

Financing Decisions: Tools of Financial Analysis: Financial Statement Analysis, Statement of Financial position. Break Even Analysis. Leverages: Operating, Financial and Combined.

UNIT V

Inventory Management and Responsibility Accounting: Methods of Inventory Management and Material Issues. Responsibility Accounting -Meaning, Objectives and Importance.Accounting Package – Tally (Operations).

Text Book:
1. Tulsian's Accountancy for Class XI, Financial Management by Khan & Jain.

Reference Book(s):
1. Financial Accounting by T.S. Grewal.
2. Financial Management by Khan and Jain.
3. NCERT Books on Accounting and Financial Management for Class XI and XII.

MCA - IV

CS-5308 Information Technology Project Management

UNIT I
Introduction to Project Management
Project, Project Management, Role of the Project Manager, Project Management and Information Technology Context, A system view of Project Management, Understanding the Organization, Stakeholder Management, Project Phases and the Project Life Cycle, Context of Information Technology Projects, Project Management Process Groups, Mapping Process Groups to Knowledge Areas.

UNIT II
Project Integration Management, Strategic Planning and Project Selection, Preliminary Scope Statements, Project Scope Management, Scope Planning and Scope Management Plan, Scope Definition and the Project Scope Statement.

UNIT III
Project Time Management, Activity Definition and Sequencing, Activity Resource and Duration Estimating, Schedule Development and Control, Project Cost Management, Cost Estimating, Cost Budgeting, Cost Control.

UNIT IV
Project Quality Management, Quality Planning, Quality Assurance , Quality Control, Project Human Resource Management, Keys to Managing People, Human Resource Planning, Acquiring the Project Team, Developing the Project Team, Managing the Project Team.

UNIT V
Project Communication Management, Communication Planning, Information Distribution, Performance Reporting, Managing Stakeholders, Project Risk Management, Risk Management Planning, Risk Response Planning ,Risk Monitoring and Control, Project Procurement Management, Planning Purchasing and Acquisitions, Planning Contracting, Requesting Seller Responses, Selecting Sellers, Administering the Contract, Closing the Contract

Text Book:
1. Information Technology Project Management, Kathy Schwalbe, 5th Edition, Thomson Course Technology.

CS-5617 Internet and Web Technology

UNIT I
Introduction to HTTP, web Server and application Servers, Installation of Application servers, Config files, Web.xml. Java Servlet, Servlet Development Process, Deployment Descriptors, The Generic Servlet, Lifecycle of Servlet. Servlet Packages, Classes, Interfaces, and Methods, Handling Forms with Servlet.

UNIT II
Various methods of Session Handling. Various elements of deployment descriptors. Java Database Connectivity: various steps in process of connection to the database, various type of JDBC Driver.

UNIT III
JSP Basics: JSP lifecycle, Directives, scripting elements, standard actions, implicit objects. Connection of JSP and Servlet with different database viz. Oracle, MS-SQL Server, MySQL. java.sql Package. Querying a database, adding records, deleting records, modifying records. Type of Statement.

UNIT IV
Separating Business Logic and Presentation Logic, Building and using JavaBean. Session handling in JSP, Types of errors and exceptions handling.

UNIT V
Introduction to Web Services, MVC Architecture, Struts and Hibernate.

Text Book:
1. K. Mukhar, "Beginning Java EE 5: From Novice to Professional", Wrox Press.

Reference Book(s):
1. M. Hall, L. Brown, "Core Servlets and Java Server Pages", 2nd edition, Pearson Education
2. G. Franciscus, "Struts Recipes", Manning Press
3. C. Bauer, G. King, "Hibernate in Action", Manning Press
4. B. Basham, K. Sierra, B. Bates, "Head First Servlet and JSP", 2nd Edition, O'Reilly Media.

CS-5701 Artificial Intelligence

UNIT I
Introduction: Intelligence v/s Artificial Intelligence, Knowledge and related issues, Applications of AI. Knowledge Management: Representation, organization, manipulation, acquisitions and maintenance of knowledge. Role of intelligent behavior.

UNIT II

Knowledge Representation Techniques: Symbolic Approaches, Representation of knowledge using prepositional logic (PL), First Order Predicate Logic (FOPL), Conversion to clausal form, Inference Rules, The Resolution principle, non-deductive inference methods, associative networks, frames, Conceptual dependencies and Scripts.

UNIT III

Introduction to LISP and PROLOG: Basic programming in LISP / PROLOG.
Problem solving in AI: Introduction, Problem characteristics, state space representation, Classical AI problems: The Eight Puzzle, Traveling Salesman Problem.

UNIT IV

Search and Control Strategies: Uninformed and Informed search techniques.
Uninformed Search: Breadth-First Search & Depth First Search;
Heuristic Search Techniques: Hill Climbing, Best first search, A* algorithm, Problem reduction, and/or graph, AO* algorithm, Constraint Satisfaction, Means-end Analysis.

UNIT V

Neural Network Computing: Introduction, basics of ANN, terminology and models of neuron, topology and basic learning laws. Activation and synaptic dynamics, learning methods, stability and convergence in ANN, Functional units of an ANN for pattern recognition.
Expert Systems: Characteristics and elements of an expert system, Building an expert system using LISP/ PROLOG.

Text Book(s):
1. Elaine Rich, Kevin Knight, Shivshankar B. Nair, *Artificial Intelligence*,3rd Edition, , Tata Mc-Graw Hill Publishing Company Ltd.,2009.
2. Dan W. Patterson, *Introduction to Artificial Intelligence and Expert Systems*, 1st edition, Prentice Hall, 1990.
3. Dan W. Patterson, *Artificial Neural Networks*, 1st edition, Prentice Hall 1998.
4. S.J. Russell & P. Norvig, *Artificial Intelligence: A Modern Approach,* Prentice Hall, 2nd edition, 2002.

Reference Book(s):
1. Elaine Rich, Kevin Knight, *Artificial Intelligence*, 2nd edition, Tata Mc-Graw-Hill Publishing Company Ltd.,New Delhi,1991.
2. N. J. Nilsson, *Artificial Intelligence: A New Synthesis*, Morgan Kaufmann Publishers, 1998.
3. Ivan Bratko, *Prolog Programming for Artificial Intelligence*, Addison Wesley; 3rd edition, 2000.

CS-5413   Data Mining & Data Warehousing

UNIT I
Fundamentals of data mining, Data Mining definitions, KDD vs Data Mining, Data Mining Functionalities, From Data Warehousing to Data Mining, DBMS vs DM, Issues and challenges in Data Mining. Data Mining Primitives, Data Mining Query Languages. Data Mining applications-Case studies.

UNIT II
Association rules: Methods to discover association rules. Various algorithms to discover association rules like A Priori Algorithm. Partition, Pincer search, Dynamic Item set Counting Algorithm etc. Cluster Analysis Introduction: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Algorithms, Hierarchical and Categorical clustering, Classification methods, Decision Trees, Neural networks, Genetic Algorithm.

UNIT III
Web Mining, Web content mining, Web Structure mining, Text mining.,Temporal Data Mining, Spatial Data Mining, Data Mining tools.

UNIT IV
Introduction: Data Warehouse, Evolution, Definition, Very large database, Application, Multidimensional Data Model, OLTP vs Data Warehouse, Data Warehouse Architecture. Data Warehouse Server, Data Warehouse Implementation, Metadata, Data Warehouse Backend Process: Data Extraction, Data Cleaning, Data Transformation, Data Reduction, Data loading and refreshing. ETL and Data warehouse, Metadata, Components of metadata.

UNIT V
Warehouse Schema, Schema Design, Database Design, Dimension Tables, Fact Table, Star Schema, Snowflake schema, Fact Constellation, De-normalization, Data Partitioning, Data Warehouse and Data Marts. SQL Extensions, PL/SQL. OLAP, Strengths of OLAP, OLTP vs OLAP, Multi-dimensional Data, Slicing and Dicing, Roll-up and Drill Down, OLAP queries, Successful Warehouse, Data Warehouse Pitfalls, DW and OLAP Research Issues, Data Warehouse Tools.

Text Book(s) :
1. Data Mining Techniques – Arun K Pujari, University Press,4th edition
2. The Data Warehouse Life cycle Tool kit – Ralph Kimball Wiley Student Edition, 2nd Edition.

Reference Book(s):

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Harcourt India. 2nd Edition.
2. Building the Data Warehouse- W. H. Inmon, Wiley Dreamtech India Pvt. Ltd, 3rd Edition.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Education, 1st Edition.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah, Wiley Student Edition, 2nd Edition.
5. Data Mining Introductory and advanced topics –Margaret H Dunham, Pearson Education, 3rd Edition.

MCA - V

CS-5216 Design and Analysis of Algorithms

UNIT I
Fundamentals: Review of asymptotics, Review of basic data structures, Review of Recursion, Review of basic algorithms, Review of time complexity.

UNIT II
Design Strategies: Divide and Conquer, Dynamic Programming, Greedy Strategy, Backtracking, Branch and Bound Technique using lucid examples.

UNIT III
Sorting and Searching: Insertion sort, Quick sort, Heap sort, Merge sort, Shell sort, Selection sort, Binary Search, Interpolation Search.

UNIT IV
String Matching: LCS problem, Smith Waterman Algorithm, Edit distance problem, Knuth-Morris-Pratt, Boyer-Moore, Longest increasing subsequence.

UNIT V
Advanced Topics: Computational Geometry, NP completeness, Approximation heuristics.

Text Book(s):
1. "Introduction to Algorithms", by Cormen, Leiserson, Rivest, and Stein, Third Edition, 2009

CS-5309 Object Oriented Analysis and Design

UNIT I
Review of object oriented concepts, potential benefits and drawbacks of object oriented, Compare object oriented paradigm with structural/procedural paradigm. Elements of Object model, what is class, how to identify them, relationship among objects, relationship among classes.
Relationships: Associations, Multiplicity, Inheritance and Generalizations, Dependencies.

UNIT II
UML: Introduction, UML basics, UML Modeling, Requirement, Architecture, Design, Implementation, Deployment process.

Class diagrams – relationships, association, generalization, dependence, constraints.

UNIT III

Object diagrams, behavioral Modeling: modeling interaction, use cases, Representing Use Case Diagram, use of Use Case diagram in analysis process, Use Case relationships and its examples, Interaction diagrams.

UNIT IV

Activity diagrams, Decisions, Concurrent path, Signals, Swim lanes, events, signals, State Machines, process, threads, time, space, state chart diagrams. Interaction view- collaboration, Interaction, sequence diagrams, Best practices of software engineering.

UNIT V

Introduction to Rational Unified Process, Architecture centric process,Use-case driven process. Case study and minor project.

Text Book(s):
   1. Booch, Object Oriented Analysis and Design with Applications, Addision Wesley.
   2. Schach, Stephen R., An introduction to Object Oriented Systems Analysis and Design with UML and unified process, 2003, TMH.

Reference Book(s):
   1. G Booch, J Rambaugh. Ivar Jacobson, The UML User guide, Pearson Education.
   2. Eric Brande, Software Design, John Wiley & Sons.
   3. David William Brown, An Introduction to Object Oriented Analys is", John Wiley

CS-5512 Compiler Design

Unit I

Compiler, Translator, Interpreter, Assembler definition, Types of compiler, Phases of compiler, one pass and multi pass compilers. Analysis of source program. Review of Finite automata, lexical analyzer, Input, buffering, Recognition of tokens, LEX: A lexical analyzer generator, Error handling.

Unit II

Introduction to parsing. Bottom up and Top down parsing techniques- Shift reduce, Operator precedence, Recursive descent and predictive parsers. LL grammars and parsers, error handling in LL parser. LR parsers, Construction of SLR. Canonical LR and LALR parsing tables.

Unit III

Syntax directed definitions and translation: Construction of syntax trees, L~attributed definitions, Intermediate code forms using postfix notation and three address code. Representing TAC using triples and quadruples, Translation of assignment statement. Boolean expression and control structures etc.

Unit IV
Definition of basic block control flow graphs, DAG representation of basic block. Advantages of DAG, Sources of optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, Peephole optimization.

Unit V
Issues in design of code generator, A simple code generator, Code generation from DAG. Code Optimization.

Text Book:
1. Aho-Ullman, Principles of Compiler Design, Narosa Publishing House.

Reference Book(s):
1. Aho-Ullman, Compilers: Principles Techniques & Tools, Addison Wesley.
2. Dhamdhere, Compiler Construction.

CS-4409 Enterprise Resource Planning

UNIT I
Process view of organization: Introduction to Business Process, Business Functional areas, Introduction to Information Systems, problems of Organizational functional division, Introduction of Enterprise systems. Evolution of Enterprise applications, Technology as process enabler, mapping an existing organization Process, Process redesign, new Process validation.

UNIT II
Approaches to Business Process Improvement: Salient features of Re-engineering,Re-engineering initiatives, managerial implications of process Re-engineering efforts,Kaizen,Total Quality Management, Implementing new process, critical success factors of Re-engineering projects, comparison of different Re-engineering approaches.

UNIT III
Introduction to Enterprise Resource Planning : Reasons for the growth of ERP market, ERP package role, Enterprise application implementation projects, Rational for ERP, Enterprise architecture planning, Selection of an ERP vendor, contracts with ERP vendors, consultants and employees.ERP project management and monitoring, Pitfalls of ERP packages, ERP implementation life cycle, Implementation methodology, organizing the implementation, Overview of ERP modules.

UNIT IV

ERP Supply chain and CRM applications : ERP market place-SAP AG, PeopleSoft, Baan, JD Edwards, Oracle Applications, ERP and related technologies. Overview of Supply and Demand chain, Supply chain framework, Benefits of Supply chain, advanced planning systems. Introduction to CRM applications, growth of CRM applications, Benefits of CRM applications.

UNIT V

ERP Package applications : Detailed study of any one ERP package with emphasis on application basics, cross sectional analysis of other ERP systems with the application. Package architecture, understanding of the application with current Business Process reference model. Case studies on ERP implementation at BPCL, CRM initiatives at 3M, Mobile CRM, Dow chemical e-CRM strategy, Sear Logistics Management Practices.

Text Book(s):
1. Enterprise Resource Planning –Alexis Leon-Tata McGraw Hill publication.
2. Enterprise Resource Planning – Mary Sumner-Pearson Prentice Hall Publication.

Reference Books:
1. Enterprise Resource Planning: Global Opportunities and Challenges - Liaquat Hossain, Jon David Patrick and M.A. Rashid – Idea Group publishing.
2. Concepts in Enterprise Resource Planning – Brady, Monk and Wagner – Thomson Learning.
3. CRM at speed of Light – Greenberg, Paul –Tata McGraw Hill publication.
4. ERP strategy – Vinod Kumar Garg , Bharat Vakharia, Jaico.
5. The E-Marketplace: Strategies for success in B2B commerce-Raisch , Warren – McGraw Hill inc. 2000.

CS-6623 Mobile and Wireless Systems

UNIT I

Overview of the emerging fields of mobile computing; Historical perspectives (mainly from the perspective of radio), Mobile applications, Limitations, Health Concerns, Cordless phone, Land mobile vs. Satellite vs. In-building communications systems, Frequencies for radio transmission. Characteristics of Cellular Systems, Mobility support in cellular telephone networks, Personal Communications Systems/Personal Communications Networks, Wireless Personal Area Network, Wireless Local Area Network and Internet Access. Mobility management, Security, Cellular telephony as a case study in network support: hand-off, mobility, roaming, billing/authorization/authentication.

UNIT II

Mobile communication: Fibre or wire based transmission, Wireless Transmission - Frequencies, Signals, Antennas and Signal Propagation, Modulation Techniques, Multiplexing techniques, Coding techniques. Cellular structure, Voice Oriented Data Communication - GSM, CDMA. GSM Architecture, Authentication & security, frequency hopping, Speech coding, Data communication with PCs, Wireless web browsing, Testing cellular Systems Speech coding.

UNIT III

Satellite Systems: History, Application, and Basics of Satellite Systems: LEO, MEO, GEO, Routing, Handover, VSAT, installation & Configuration. Cyclic repetition of data, Digital Audio Video Broadcasting, Multimedia object tran-sfer Protocol, Wireless LAN topologies, requirements. Physical layer, MAC sublayer, IEEE802.11.HIPERLAN: Protocol architecture, layers, Information bases and networking, Bluetooth.

UNIT IV

Basics of Discrete Event Simulation, Application and Experimentation, Simulation models. Case Study on Performance Evolution of IEEE 802.11 WLAN configuration using Simulation, MobileIP, goals, assumptions requirements, entities and terminology, IP packet delivery, tunnelling and encapsulation, Feature and format of IPv6, DHCP, TCP over Wireless. Characteristic of Ad Hoc networks, Applications, need for routing, routing classification, Wireless sensor networks, classification and Fundamentals of MAC protocol for wireless sensor networks.

UNIT V

Economics Benefits of Wireless Networks, Wireless Data Forecast, Charging issues, Role of Government, Infrastructure manufacturer, Enabling Applications Mobile operating System, file system, Process, Task, Thread, ISR and IST, CODA, HTTP versus HTML. WML, XML application for wireless handheld devices. UWB systems Characteristics, Current approaches for security.

Text Book(s):
1. Mobile Communications author Jochen Schiller, publication John Willy & Sons, Ltd.

Reference Book(s):
1. Wireless And Mobile Systems,D. P. Agrawal,Qing-An zeng, Thomson publication.
2. Wireless Networks, P Nicopotidis, Addision –Wesley-An zeng publication.