SYLLABUS

FOR

Master of Computer Application (MCA) Programme



H. N. B. GARHWAL UNIVERSITY SRINAGAR (GARHWAL)

Department of Computer Science and Engineering School of Engineering and Technology H.N.B. GARHWAL UNIVERSITY (A Central University) Regulations, Curricula, Syllabus and Scheme of Examinations (Credit and Semester System) Master of Computer Applications (With effect from session 2015-2016)

- 1. Duration of the MCA program shall be 3 years, divided into 6 semesters. Each semester should have 15 18 weeks. The entire period of the sixth semester shall be devoted for the Major project work.
- 2. Selection will be based on Entrance examination conducted by the University. Candidates studying in the final year / semester of their qualifying degree may appear for the entrance examination. The Entrance examination will consist of questions from the following:

Mathematics(10+2 level)	:	80%
Aptitude and Mental ability	:	20%

- **3.** Eligibility for admission: Recognized Bachelor's degree of minimum 3 Yrs duration with Mathematics at 10+2 level. Obtained at least 50% (45% in case of candidate belonging to reserved category) at the qualifying examination
- 4. Course Structure
 - Two kinds of courses/subjects/papers are offered core courses and elective courses. Core courses are offered by the department conducting the programme. Elective courses are offered either by the department conducting the programme or by any other department.
 - Elective courses should be relevant to the programme for which the student is admitted and are identified by the department.
 - Each course shall have a unique alphanumerical code.
 - No regular student shall register for more than 22 credits and less than 10 credits per semester.
 - The minimum total credits required for the successful completion of a six semester MCA programme is 108.
- 5. Evaluation of all semester papers will be in two parts viz. Continuous Assessment (CA) and End Semester Assessment (ESA). Forty percent marks will be set apart for CA and sixty percent marks will be set apart for ESA, for theory, practical and project parts. Weightage for theory, practical and project components will be according to the credit distribution.

Continuous assessment includes assignments, seminars, periodic written examination etc. There shall be a minimum of two test papers of 15% marks each and one assignment of 10% marks.

End Semester Assessment:

Question pattern (Theory part): There shall be eight *question carrying equal marks*. Each question may contain sub divisions also. Student has to answer any four full questions, selecting one question from each unit, to secure full marks.

Question pattern (Practical part): One compulsory question that may contain sub divisions is to be attempted by the student.

Project:

Major Project: The Major project work should be carried out over the entire period of the final semester in an Industry / R and D organization / Department. If the project is carried out in an Industry / R and D organization outside the campus, then a co-guide shall be selected from the Department. If the project work is of interdisciplinary in nature, a co-guide shall be taken from the other department concerned. Every student should do the Major Project individually and no grouping is allowed. All the candidates are required to get the approval of their synopsis and the guide before commencement of the project from the Department. A Supervisor / Guide should be a postgraduate in CS or allied subject or a person of eminence in the area in which student has chosen the project. A Departmental committee duly constituted by the Head of the Department will review the project periodically every month. The Continuous Assessment marks (CA) will be based on the periodic progress and progress report. At the end of the semester the candidate shall submit the Project report (two bound copies and one soft copy) duly approved by the guide, coguide for End Semester Assessment. A board of two examiners appointed by the University should conduct evaluation for ESA. If project work and the report are found to be not up to the expected standard, the examiners can ask the candidate to modify and resubmit the project report after incorporating the suggestions of the examiners. Such reports shall be resubmitted within the stipulated period suggested by the examiner(s).

6. Grading:

As per University/UGC Norms.

All other ordinances related to examination and result declaration will be as per t ordinances framed by University for UG Courses.

Master of Computer Application (MCA)

Programme Structure

Semester - I

SET/CSE/MCA/C101 SET/CSE/MCA/C102 SET/CSE/MCA/C103 SET/CSE/MCA/C104 SET/CSE/MCA/C105 SET/CSE/MCA/CP11 SET/CSE/MCA/CP12	:::::::::::::::::::::::::::::::::::::::	Computers and Information Technology Programming and Problem Solving in 'C' Mathematical Foundation of Computer Science Computer Organization and Architecture System Analysis and Design Computers and Information Technology Programming and Problem Solving in 'C'
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Semester - II

SET/CSE/MCA/C201	:	Software Engineering
SET/CSE/MCA/C202	:	Data and File Structure
SET/CSE/MCA/C203	:	Object Oriented Programming Using C++
SET/CSE/MCA/C204	:	Computer Based Numerical and Statistical Techniques
SET/CSE/MCA/C205	:	Combinatorics and Graph Theory
SET/CSE/MCA/CP21	:	Data Structure Using 'C'
SET/CSE/MCA/CP24	:	Computer Base Numerical and Statistical Techniques using C++
Self Study Course		

Semester - III

SET/CSE/MCA/C301	:	Data Base Management System
SET/CSE/MCA/C302	:	Computer Networks
SET/CSE/MCA/E303	:	Operating Systems
SET/CSE/MCA/E304	:	Distributed Systems
SET/CSE/MCA/E305	:	Analysis and Design of Algorithms
SET/CSE/MCA/E306	:	Theory of Computation
SET/CSE/MCA/E307	:	Artificial Intelligence
SET/CSE/MCA/E308	:	ERP System
SET/CSE/MCA/CP31	:	Data Base Management System
SET/CSE/MCA/CP33	:	Computer Networks
Self Study Course		

Semester-IV

SET/CSE/MCA/C401	:	Graphics and Animation
SET/CSE/MCA/C402	:	Introduction to JAVA Programming
SET/CSE/MCA/E403	:	Multimedia Technology and Applications
SET/CSE/MCA/E404	:	Network Security and Cryptography
SET/CSE/MCA/E405	:	Natural Language Processing
SET/CSE/MCA/E406	:	Unified Modeling Language
SET/CSE/MCA/E407	:	Computer Based Optimization Techniques
SET/CSE/MCA/E408	:	Wireless and Mobile Computing
SET/CSE/MCA/E409	:	Human- Computer Interaction
SET/CSE/MCA/E410	:	Image Processing
SET/CSE/MCA/E411	:	Compiler Designing
SET/CSE/MCA/CP41	:	Computer Graphics
SET/CSE/MCA/CP42	:	Java Programming
Self Study Course		

SEMESTER - V

SET/CSE/MCA/C501	:	Management Information System
SET/CSE/MCA/C502	:	Unix and Shell Programming
SET/CSE/MCA/C503	:	Data Mining
SET/CSE/MCA/C504	:	E-Commerce
SET/CSE/MCA/E505	:	ASP.NET
SET/CSE/MCA/E506	:	Visual Programming
SET/CSE/MCA/CP51	:	Unix and Shell Programming
SET/CSE/MCA/CP52	:	E505 or E506

SEMESTER VI

SET/CSE/MCA/CPR601	:	Project work 6 months duration (In an organization)
SET/CSE/MCA/E602	:	Seminar
SET/CSE/MCA/E603	:	Group Discussion

FIRST SEMESTER:

Subject Code	Subject	Instructional Hrs/Week			Marks	Credit		
		L	T	Р	ESA	CA	Sub Total	
Theory								
SET/CSE/MCA/C101	Computers and Information Technology	2	-	-	60	40	100	2
SET/CSE/MCA/C102	Programming and Problem Solving in 'C'	3	-	-	60	40	100	3
SET/CSE/MCA/C103	Mathematical Foundation of Computer Science	3	-	-	60	40	100	3
SET/CSE/MCA/C104	Computer Organization and Architecture	3	-	-	60	40	100	3
SET/CSE/MCA/C105	System Analysis and Design	2	1	-	60	40	100	3
Practical								•
SET/CSE/MCA/CP11	Computers and Information Technology	-	-	6	60	40	100	2
SET/CSE/MCA/CP12	Programming and Problem Solving in 'C'	-	-	6	60	40	100	2
	Total	13	1	12	420	280	700	18
ESA : End Semester	Assessment CA : Contin	uous A	Assessm	ent	ç	Sub. Total	: Subjec	t Total

SECOND SEMESTER:

Subject Code	Subject	ct Instru Hrs/V		nal	Marks	Credit		
		L	Т	P	ESA	CA	Sub Total	•
Theory		•		•	•		•	
SET/CSE/MCA/C201	Software Engineering	2	-	-	60	40	100	2
SET/CSE/MCA/C202	Data and File Structure	3	-	-	60	40	100	3
SET/CSE/MCA/C203	Object Oriented Programming Using C++	3	-	-	60	40	100	3
SET/CSE/MCA/C204	Computer Base Numerical and Statistical Techniques	3	-	-	60	40	100	3
SET/CSE/MCA/C205	Combinatorics and Graph Theory	2	1	-	60	40	100	3
Practical								•
SET/CSE/MCA/CP21	Data Structure Using 'C'	-	-	6	60	40	100	2
SET/CSE/MCA/CP22	Computer Base Numerical and Statistical Techniques using C++	-	-	6	60	40	100	2
	Total	13	1	12	420	280	700	18
Self Study Course***								
	Professional Communication	-	-	-	100	-	100	3
ESA : End	Semester Assessment							

CA

: Continuous Assessment

Sub. Total : Subject Total THIRD SEMESTER:

Subject Code	Subject	Inst Hrs/	·uctio Week	nal	Marks	Credit		
		L	T	Р	ESA	СА	Sub Total	
Theory		1	I	1	1	1		1
SET/CSE/MCA/C301	Data Base Management System	2	-	-	60	40	100	2
SET/CSE/MCA/C302	Computer Networks	3	-	-	60	40	100	3
Elective I		I	1	1	1			1
SET/CSE/MCA/E303	Operating Systems	3	_	_	60	40	100	3
SET/CSE/MCA/E304	Distributed Systems	5						
Енспуст			-			1		r
SET/CSE/MCA/E305	Analysis and Design of Algorithms	3	-	_	60	40	100	3
SET/CSE/MCA/E306	Theory of Computation							
Elective III		1		1	1	1	I	1
SET/CSE/MCA/E307	Artificial Intelligence	2	1	_	60	40	100	3
SET/CSE/MCA/E308	ERP System	1						
Practical			Ċ					
SET/CSE/MCA/CP31	Data Base Management System	-	-	6	60	40	100	2
SET/CSE/MCA/CP32	Computer Networks	-	-	6	60	40	100	2
	Total	13	1	12	420	280	700	18
Self Study Course***		1	1	1	1	1		1
	Ethical Hacking	-	-	-	100	-	100	3
ESA : End	Semester Assessment							

Sub. Total

: Subject Total

FOURTH SEMESTER:

Subject Code	Subject	Inst Hrs/	ructio Week	nal	Marks	Credit		
		L	T	Р	ESA	CA	Sub Total	
Theory		1	1					1
SET/CSE/MCA/C401	Graphics and Animation	2	-	-	60	40	100	2
SET/CSE/MCA/C402	Introduction to JAVA programming	3	-	-	60	40	100	3
Elective IV			•				·	
SET/CSE/MCA/E403	Multimedia Technology and							
	Applications							
SET/CSE/MCA/E404	Network Security and	3	-	-	60	40	100	3
	Cryptography							
SET/CSE/MCA/E405	Natural Language Processing	-						
Elective V								
SET/CSE/MCA/E406	Unified Modeling Language							
SET/CSE/MCA/E407	Computer Based Optimization	3		_	60	40	100	3
	Techniques							
SET/CSE/MCA/E408	Wireless and Mobile Computing							
Elective VI								
SET/CSE/MCA/E409	Human- Computer Interaction							_
SET/CSE/MCA/E410	Image Processing	2	1	-	60	40	100	3
SET/CSE/MCA/E411	Compiler Designing							
Practical								
SET/CSE/MCA/CP41	Computer Graphics	-	-	6	60	40	100	2
SET/CSE/MCA/CP42	Java Programming	-	-	6	60	40	100	2
	Total	13	1	12	420	280	700	18
Self Study Course***					•			·
	Cyber Laws	-	-	-	100	-	100	3
ESA : End	d Semester Assessment							

: Continuous Assessment : Subject Total

CA Sub. Total

FIFTH SEMESTER:

Subject Code	Subject		ruction Week	al	Marks	Credit		
		L	T	Р	ESA	CA	Sub Total	
Theory		1	1	1	1	1		1
SET/CSE/MCA/C501	Management Information System	2	-	-	60	40	100	2
SET/CSE/MCA/C502	Unix and Shell Programming	3	-	-	60	40	100	3
SET/CSE/MCA/C503	Data Mining	3	-	-	60	40	100	3
SET/CSE/MCA/C504	E-Commerce	2	1	-	60	40	100	3
Elective VII			•		•			
SET/CSE/MCA/E505	ASP.NET	2			60	40	100	3
SET/CSE/MCA/E506	Visual Programming		-	-			100	
Practical			·		•			
SET/CSE/MCA/CP51	Unix and Shell Programming	-	-	6	60	40	100	2
SET/CSE/MCA/EP52	Elective- VII	-	-	6	60	40	100	2
	Total	13	1	12	420	280	700	18

SIXTH SEMESTER:

Subject Code	Subject	Instructional Hrs/Week			Marks			Credit
		L	T	Р	ESA	СА	Sub Total	
Practical								
SET/CSE/MCA/PR61	Thesis/Project Work	-	3	18	400	200	600	15
Elective IX								
SET/CSE/MCA/E601	Seminar	-	-	-	-	100	100	3
SET/CSE/MCA/E602	Group Discussion							
Total		-	3	18	400	300	700	18

ESA : End Semester Assessment

CA : Continuous Assessment

Sub. Total : Subject Total

Note: End Semester Project Work: One Soft and Hard copy of final project work will have to be submitted in the University by the Institution/College of each student.

SET/CSE/MCA/C101: Computers and Information Technology

Computer Basics: Introduction, Typical Model of Computer, Classification and Characteristic of Computer, Computer generations, Description of Computer hardware components. Primary and secondary storage devices and their functions. Input and Output device and their functions. Comparison based analysis of various hardware components, Types of software.

Basic Operating System Concepts: Functional knowledge of MS-DOS, WINDOWS, UNIX operating systems. Introduction to Basic Internal/ External Commands of DOS, Basic UNIX command and vi editor. Managing file and directories in various operating Systems.

Computer and Information System in Business: Computer application in business, project Management, Computers in Personal and Administration, Accounting Information System, Computer Application in Purchasing, Material Management, Production Planning and Control.

MS-Office: Proficiency in performing functions in Microsoft WORD, Excel, Power Point, Access and Front Page,

Internet: Introduction to internet and WWW, Web browsers, Search engines, Intranet, Extranet and Electronic mail.

IT Technologies: Electronic/ Mobile Commerce, Hypermedia, Data warehouses and Data marts, Data mining, On-Line Analytical Processing (OLAP).

- 1. Fundamental of Information Technology : Alexis Leon, Leon Vikas Publication.
- 2. Fundamentals of Computers : V. Rajaraman, PHI.
- 3. Computers Today: Suresh K. Basandra, Galgotia Publication.
- 4. Exploring UNIX : Stephen
- 5. Learning DOS : R. Bangia, Khanna Book Publication.
- 6. Internet: An Introduction: Manish Dixit, TMH.
- 7. Internet for everyone : Mathews Leon , Lean Techworld.

SET/CSE/MCA/C102: Programming and Problem Solving in 'C'

Basic Programming Concepts: Introduction to the basic ideas of problem solving and programming using principles of top-down modular design, Flowcharts, Abstraction Mechanisms, Stepwise Refinement.

Introduction to Programming Language C: Data Types, Instruction and its Types, Storage Classes, C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements and symbolic constants, #include, define, if def. Preparing and running a complete C program.

Operators and expressions: Arithmetic, unary, logical, bit-wise, assignment and conditional operators, Library functions, Control statements: while, dowhile, for statements, nested loops. If-else, switch, break, continue and go to statements, comma operator.

Functions: Defining and accessing: passing arguments, Function prototypes, Recursion, Use of library functions.

Storage classes: automatic, external and static variables.

Arrays: Defining and processing, passing to a function, Multi dimensional arrays. Strings: Operations on strings.

Pointers: Declarations, Passing to a function, Operations on pointers, Pointers and arrays, Arrays of pointers.

Structures: Defining and processing, passing to a function, Unions. Data files: Open, close, create, process, Unformatted data files.

- 1. Hutchison, R. : "Programming in C". McGraw Hill.
- 2. Johnsonbaugh R. and Kalin M. : "Applications Programming in C". PHI.
- 3. Rajaraman, V.:"Computer Programming in C". Prentice Hall of India.
- 4. D. Richi : C Programming. Prentice Hall of India.

SET/CSE/MCA/C103: Mathematical Foundation of Computer Science

Relation: Type and compositions of relations, Pictorial representation of relations, Equivalence relations, Partial ordering relation.

Function: Types, Composition of function, Recursively defined function.

Mathematical Induction: Piano's axioms, Mathematical Induction, Discrete Numeric Functions and Generating functions, Simple Recurrence relation with constant coefficients, Linear recurrence relation without constant coefficients, Asymptotic Behaviour of functions

Algebric Structures: Properties, Semi group, monoid, Group, Abelian group, properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Automorphism of groups.

Calculus: Functions, limits and Continuity, differentiation and Integration, Differential Equations.

Linear equations and Matrices: Row/column operations, Gaussian Elimination, Decomposition, inverse.

Determinant: Properties of determinants, Cramer's Rule, determinants to transpose and inverse.

Vector spaces: Linear independence, Bases, subspace and dimensionality.

Inner Products and Norms: Length, angle, direction cosines; Orthogonalization.

Prepositional Logic: Preposition, First order logic, Basic logical operations, Tautologies, Contradictions, Algebra of Proposition, Logical implication, Logical equivalence, Normal forms, Inference Theory, Predicates and quantifiers, Posets, Hasse Diagram.

- 1. Liptschutz, Seymour, "Discrete Mathematics", TMH.
- 2. Trembley, J.P. and R. Manohar, "Discrete mathematical Structure with Application to Computer Science", TMH.
- 3. Kenneth H. Rosen, "Discrete Mathematics and its applications', TMH.
- 4. Doerr Alan and Levasseur Kenneth, "Applied Discrete Structure for Computer Science, Galgotia Pub. Pvt. Ltd.
- 5. Gersting "Mathematical Structure for Computer Science", WH freeman and Macmillan
- 6. Korthage, R.R.: Discrete Computational Structures, Academic Press.
- 7. C.L.Liu "Elements of Discrete Machmatics", McGraw Hill.
- 8. Peter Grossman, "Discrete Mathematics for Computer", Palgrave Macmillian.

SET/CSE/MCA/C104: Computer Organization and Architecture

Representation of information and Basic Building Blocks: Number System: Binary, Octal, Hexadecimal and their conversion, Character Codes: BCD, ASCII, EBCDIC. Digital Codes: Gray Code, XS-3 Code.

Logic circuits : Basic Logic Functions, Synthesis of Logic Functions Using AND, OR and NOT Gates, Minimization of Logic Expression, Synthesis with NAND and NOR Gates, Implementation of Logic Gates, Flip-Flops, Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices, Sequential Circuits.

Basic Structure of Computer Hardware and Software: Functional units, Basic operational concepts, Bus structures, Software, Performance, Distributed Computing.

Addressing Methods : Basic Concepts, Memory Locations, Main Memory Operations, Addressing Modes, Basic I/O operations, Stacks and Queues, Subroutines.

Processing Unit : Some Fundamental Concepts, Execution of a Complete Instruction, Hardwired Control, Performance Considerations, Micro Programmed Control, Signed Addition and Subtraction, Arithmetic and Branching Conditions, Multiplication of Positive Numbers, Signed-Operand Multiplication, Fast Multiplication, Integer Division, Floating-Point Numbers and Operations.

Input-output Organization: Accessing I/O Devices, Interrupts, Direct Memory Access, I/O Hardware, Standard I/O Interfaces.

Memory: Semiconductor RAM memories, Read-Only Memories, Cache Memories, Performance Considerations, Virtual Memories, Memory Management Requirements.

Introduction to Computer Peripherals: I/O Devices, On-Line Storage.

- 1. Willam Stalling, "Computer Organization and Architecture" Pearson Education Asia
- 2. Mano Morris, "Computer System Architecture" PHI
- 3. Zaky and Hamacher, "Computer Organization: McGraw Hill
- 4. B. Ram, "Computer Fundamental Architecture and Organization" New Age
- 5. Tannenbaum, "Structured Computer Organization" PHI.
- 6. Hayes: Computer Architecture and Organization, Mc Graw Hill.
- 7. G.L. Jr.: Computer design, Computech Press Langdon.
- 8. Bywater: Hardware- Software Design of digital System

SET/CSE/MCA/C105: System Analysis and Design

System Concepts and Information System Environment: The System Concept, Definition, Characteristics of Systems, Elements of a System, Open and Closed and closed system, Formal and Informal Information Systems, Computer based Information Systems, Management Information System, Decision Support System, General Business Knowledge, and Interpersonal Communicational System.

The System Development Life Cycle: Recognition of needs, Impetus for System Change, Feasibility Study, Analysis, Design, Implementation, Post implementation and Maintenance.

The Role of the Systems Analyst: Historical Perspective, Academic and Personal Qualifications, the multifaceted role of the Analyst, The Analyst/User Interface, Behavioral issues.

Systems Planning and Initial Investigation: Strategies for Determining Information Requirement, Problem Definition and Project initiation, Background Analysis, Fact Analysis, Review of Written Documents, Onsite Observations, Interviews and Questionnaires, Fact Analysis, Performance Analysis, Efficiency Analysis, Service Analysis.

Information Gathering: Kind of Information needed. Information about the firms, Information gathering tools, the art of Interviewing, Arranging the Interview, Guides to Successful Interview, Types of Interviews and Questionnaires, The Structured and Unstructured Alternatives.

The Tools of Structured Analysis: The Dataflow Diagram (DFD), Data Dictionary, Decision Trees and Structured English.

Feasibility Study: System performance, Economic Feasibility, Technical Feasibility, Behavioral Feasibility, Steps in Feasibility Analysis.

Input/Output and Forms Design: Input Design, CRT Screen Design, Output Design, Requirements form Design.

- 1. Elias M.Awad, "Systems Analysis and Design" Galgotia Publication
- 2. Hoffer, "Modern Systems Analysis and Design" Addision Wesley
- 3. Kendall, "Introduction to System Analysis and Desogm", McGraw Hill
- 4. System Analysis and Design Handbook: V. K. Jain, Wiley dreamtech

SET/CSE/MCA/C201: Software Engineering

Introduction: Introduction to software engineering, Importance of software, evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software engineering problems, Software Development Life Cycle, Software Process.

Software Requirement Specification: Analysis, Principles, Water Fall Model, The Incremental Model, Prototyping, Spiral Model, Role of management in software development, Role of matrices and Measurement, Problem Analysis, Requirement specification, Monitoring and Control.

Software-Design: Design principles, problem partitioning, abstraction, top down and bottom up-design, Structured approach functional versus object oriented approach, design specifications and verification, Monitoring and control, Cohesiveness, coupling, Forth generation techniques, Functional independence, Software Architecture, Transaction and Transaction and Transform Mapping, Component level Design, Forth Generation Techniques. Coding: Top-Down and Bottom-Up programming, structured programming, information hiding, programming style and internal documentation.

Testing principles, Levels of testing, functional testing, structural testing, test plane, test case specification, reliability assessment, software testing strategies, Verification and validation, Unit testing, Integration Testing, Alpha and Beta testing, system testing and debugging.

Software Project Management: The Management spectrum (The people, the product, the process, the project) Cost estimation, project scheduling, staffing, software configuration management, Structured Vs. Unstructured maintenance, quality assurance, project monitoring, risk management.

Software Reliability and Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Software quality, ISO 9000 Certification for software industry, SEI capability maturity model, comparison between ISO and SEI CMM. CASE (Computer Aided Software Engineering): CASE and its scope, CASE support in software life cycle, documentation, project management, internal interface, Reverse Software Engineering, Architecture of CASE environment.

- 1. Pressman, Roger S., "Software Engineering: A Practitioner's Approach Ed. oston: McGraw Hill
- 2. Jalote, Pankaj, "Software Engineering Ed.2"New Delhi: Narosa 2002
- 3. Schaum's Series, "Software Engineering" TMH
- 4. Ghezzi Carlo and Others "Fundamentals of Software Engineering" PHI
- 5. Alexis, Leon and Mathews Leon, "Fundamental of Software Engg.
- 6. Sommerville, Ian, "Software Engineering" AWL
- 7. Fairly, "Software Engineering" New Delhi" TMH
- 8. Pfleerger, S. "Software Engineering" Macmillan, 1987
- 9. Software Testing Tools: Dr. Prasad, Wiley dreamtech India Pvt. Ltd.

SET/CSE/MCA/C202: Data and File Structure

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off. Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered list, Sparse Matrices, and Vector. Stacks: Array Representation and Implementation of stack, Operations and Stacks: Push and POP, Array Representation of stack, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem.

Queues: Array and linked representation and implementation of queues, Operations on Queue; Create, Add, Delete, Full and Empty, Circular queue, Dequeue, and Priority Queue. Link List: Representation and implementation of Singly linked lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List of Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

Trees: Basic terminology, Binary Tree, Binary tree representation algebraic Expressions, Complete Binary Tree, Extended Binary Tree, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary tree, Huffman algorithm. Searching and Hashing: Sequential search, comparison and analysis, Hash Table, Hash Function, Collection Resolution Strategies, Hash Table Implementation.

Sorting: Insertion Sort, Bubble sorting, Quick Sort, Two way Merge Sort, Heap Sort, Sorting on Different Keys, Practical Consideration for Internal Sorting. Binary Search Trees, AVL Tree, B-trees.

File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices.

- 1. Horowitz and Sahani, "Fundamentals of data Structures" Galgotia
- 2. R. Kruse etal, "Data Structures and Program Design in C" Person Education
- 3. A.M. Tenenbaum etal, "Data Structures and Program Design in C" Person Education
- 4. Lipschutz, "Data Structure", TMH
- 5. K Loudon, "Mastering Algorithms With C", Shroff Publishers and Distributors
- 6. Bruno R Preiss, "Data Structure and Algorithms with Object Oriented Design Pattern in C++, Jhon Wiley and Sons, Inc.
- 7. Adm Frozdek, "Data Structures and Algorithms in C++" Thomson Asia
- 8. Pal G. Sorenson, "An Introduction to Data Structures with Application", TMH
- 9. C and Data Structure: Desh Pandey, Wiley dreamtech India Pvt. Ltd.
- 10. Data Structures- Principles and Fundamental : Keogh Davidson, Wiley dreamtech

SET/CSE/MCA/C203: Object Oriented Programming Using C++

Introduction: Introduction to OOP, Basic Concepts of OOP, Applications of OOP. Introduction to C++, Introduction to C++ stream I/O, declarations in C++, Creating New data types in C++, function Prototypes, Inline functions, Reference Parameters, Const Qualifier, Dynamic memory allocation, default arguments, Unary Scope resolution operator, Linkage specifications. Class, Constructors, Friend Class : Introduction, Comparing class with

Structure, Class Scope, Accessing Members of a class, Constructor, Destructor, Const objects, Const member functions, Friend class, Friend function, This pointer, Data abstraction and Information hiding, container classes and Iterators.

Overloading and Inheritance: Operator Overloading, Fundamentals, Restrictions, Overloading stream, Insertion and stream extraction operators, Overloading unary and binary operators, Converting between types, Overloading ++ and --. Inheritance, Introduction, Protected members, Casting base _class pointers to derived _class pointers Overloading Base class members in a Derived class, Public, Protocols and Private inheritance, Direct base classes and Indirect Base Classes, Using Constructors and Destructors in Derived classes, Implicit Derived class object to base class object conversion.

Virtual Functions : Introduction, Type fields and switch statements, Virtual functions, Abstract base classes and concrete classes, Polymorphism, Dynamic binding, Virtual destructors.

C++ Stream I/O : Streams, Stream Input, Stream Output, Unformatted I/O, Stream manipulators, Stream format states, Stream error, States.

Files : File Operations –File pointers – error Handling during file Operations Templates Handling: Templates, Function templates, Class templates, Overloading template functions, Class template and non type parameters, Templates with Multiple parameters.

Exception Handling: Exception handling, Basic of C++ exception, Catching an exception, re-throwing an exception, exception specifications.

- 1. Deitel H.M. and Deitel P.J. "How to Program C++" PHI 2003
- 2. Al stevenes "C++ Programming" Wiley dreamtech 2003.
- 3. Herbert Scheldt, "Complete Reference".
- 4. Starting out with OOPS in C++ : Tony Gaddis, Wiley dreamtech India Pvt. Ltd.
- 5. E. Balagurusamy "Object Oriented Programming with C++".
- 6. Yashwant Kanetkar, "Let Us C++".
- 7. C++ Programming by Herbert Scheldt 2004.

SET/CSE/MCA/C204: Computer Based Numerical and Statistical Techniques

(Note: Non-programmable calculator may be used in examination)

Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation, Errors in numerical computation.

Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.

Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, III conditioned system of equations, Refinement of solution. Gauss Seidal iterative method, Rate of Convergence. Interpolation and approximation: Finite Differences, Difference tables.

Polynomial Interpolation: Newton's forward and backward formula Central Difference Formulae: Gauss forward and backward formula, stirling's Bassel's Everett's formula. Interpolation with unequal intervals: Language's Interpolation, Newton Divided difference formula, Hermite's interpolation Approximation of function by Taylor's series and Chebyshev polynomial.

Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapazoidal rule, Simpon's rules, Boole's Rule Euler-Maclaurin Formula Solution of Differential Equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector method, Automatic error monitoring, stability of solution. Curve fitting, Cubic Spline and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves etc.

Concept of probability, Different Frequency Chart like Histogram, Frequency curve, Pi-chart, basic correlation and Regression.

- 1. Rajaraman V., :Computer Oriented Numerical Methods". PHI
- 2. Gerald and Wheatley, "Applied Numerical Analyses", AW
- 3. Jain, Lyengar and Jain, "Numerical Methods for Scientific and Engineering Computations:, New Ager Int.
- 4. Grewal B.S., "Numerical methods in Engineering and Science. Khanna Publishers, Delhi.
- 5. T.Veerarajan, T Ramchandran, "Theory and Problems of Numerical Methods", TMH
- 6. Pradip Niyogi, :Numerical Analysis and Algorithms:, TMH
- 7. Francis Scheld, "Numerical Analysis", TMH
- 8. Gupta S.P., "Statistical Meythods", Sultan and Sons

SET/CSE/MCA/C205: Combinatorics and Graph Theory

Rules of sum and products, Permutation, Combination, Permutation groups and application, Probability, Remsey Theory, Discrete numeric function and generating function, combinatorial problems, Difference equation.

Recurrence Relation: Introduction, Linear recurrence relation with constant coefficient, Homogeneous solution, Particular solution, Total solution, Solution by the method of generating function.

Graphs, sub-graphs, some basic properties, Walks, Path and circuits, Connected graphs, Disconnected graphs and component, Eular and Hamiltonian graphs, Various operation on graphs, Tree and fundamental circuits, Distance diameters, Radius and pendent vertices, Rooted and binary trees, Counting trees, Spanning trees, Finding all spanning trees of a graph and a weighted graph.

Cut-sets and cut vertices, some basic properties, All cut sets in a graph, Fundamental circuit and cut sets, Connectivity and seperatability, Network flows, Planner graphs, Combinatorial and geometric dual, Kuratowski to graph detection of planarity, Geometric dual, Some more criterion of planarity, Thickness and Crossings, Vector space of a graph and vectors, basis vectors, cut set vector, circuit vector, circuit and cut set verses sub spaces, orthogonal vector and sub space. Indicidence matrix and adjacency matrix of graphs.

Coloring and covering partitioning of graph, Chromatic number, Chromatic partitioning, Chromatic polynomials, Matching, covering, Four color problem, Directed graph, Types of directed graphs, Directed paths and connectedness, Euler digraph, Tree and directed edges, Fundamental circuit in digraph, Matrices A,B,C of digraph adjacency matrix of digraph, Enumeration and its types, counting of labeled and unlabeled trees, Polya's theorem, Graph enumeration with polyas theorem, Graph theoretic algorithm.

- 1. Deo Narsing, :Graph Theory with applications to engineering and computer science", PHI
- 2. Tremblay and Manohar, :Discrete mathematical structures with applications to computer Science:, TMH
- 3. Joshi K.D., "Fundamental of discrete mathematics:, New Age International
- 4. John Truss, "Discrete mathematics of computer scientist"
- 5. C.L. Liu, "Discrete mathematics"

SET/CSE/MCA/C301: Data Base Management System

Introduction: An overview of database management system, Database System Vs File System, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DMI, Overall Database structure. Data modeling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

Relational Data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, relational calculus, tuple and domain calculus.

Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joints, Unions, Intersection, Minus, Cursors in SQL. PL/SQL, Triggers and clusters.

Database Design and Normalization: Functional dependencies, normal forms, first, second third normal forms, BCNF, inclusion dependencies, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design

- 1. Date C.J. "An Introduction to Database System". Addision Wesley
- 2. Korth, Silbertz, Sudarshan, "Database Concepts" McGraw Hill
- 3. Database Management System: V. K. Jain, Wiley dreamtech
- 4. Elmasri, Navathe, "Fundamentals of Database Systems" Addision Wesley
- 5. Paul Beynon Davis, "Database Systems" Palgrave Macmillan
- 6. Bipin C. Desai, "An introduction to Database Systems", Galgotia Pub.
- 7. Begining SQL: Paul Wilton, Wiley dreamtech

SET/CSE/MCA/C302: Computer Networks

Introduction and The Physical Layer: Uses of Computer Networks, Network Hardware, Network Software, Topology, Network types, Reference Model (OSI, TCP/IP Overview), The Physical Layer, Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites, Digital and Analog Signal, FSK, PSK, modulation techniques, Switching techniques.

The Data Link Layer: Data Link Layer Design Issues, Error Detection and Correlation, Flow Control Protocols, Stop-and-wait Flow Control, Sliding – Window Flow Control, Error Control, Stop-and-wait ARQ, Go-back-N, Selective-repeat, Example of Data Link Protocols- HDLC.

The Medium Access Control Sub Layer: The Channel Allocation Problem, Multiple Access Protocols, Ethernet, wireless LANs, Blue Tooth, Data Link Layer Switching.

The Network Layer: Network Layer Design Issues, Routing, Quality of Service, Internetworking,

The Transport Layer : The Transport layer Services, Elements of Transport Protocols, A Simple Transport Protocol, The Internet Transport Protocols; UDP, TCP, Performance Issues, Congestion control.

Application Layer: Network Security, DES, RSA algorithms, Domain Name System, Simple Network Management Protocol, Electronic mail, File Transfer Protocol, Hyper Text Transfer Protocol, Cryptography and compression Techniques.

- 1. A.S. Tanenbaum, "Computer Networks, 3rd Edition," PHI
- 2. W.Stallings, "Data and Computer Communication" Macmillan Press
- 3. Comer, "Internetworking with TCP/IP" PHI
- 4. Comer, "Computer networks and Inter" PHI
- 5. Forouzan, "Data Communication and Networking:. TMH
- 6. Principle of Digital Communication and Computer Network, Dr. Prasad, Wiley Dreamtech India.

SET/CSE/MCA/E303: Operating Systems

Introduction, What is an Operating System, Simple Batch Systems, Multiprogrammed Batches systems, Time-Sharing Systems, Personalcomputer systems, Parallel systems, Distributed Systems, Real-Time Systems.

Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation, Segmentation with Paging Virtual Memory: Demand Paging, Page Replacement, Pagereplacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations, Demand Segmentation.

Processes: Process Concept, Process Scheduling, Operation on Processes, Cooperating Processes, Interprocess Communication

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple- Processor Scheduling, Real-Time Scheduling, Algorithm Evaluation.

Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Critical Regions, Monitors, Synchronization in Solaris 2, Atomic Transactions.

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Combined Approach to Deadlock Handling.

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Device Characteristics-Hardware Consideration, Input or Output Devices, Storage Devices, Channels and Control Units, Independent Device Operation, Buffering, Multiple Paths, Block Multiplexing, Device Allocation Consideration, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability, Stable-Storage Implementation.

Information Management: Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System File-System Interface: File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File-System Implementation: File-System Structure, Allocation Methods, Free-Space Management, Directory Implementation, Efficiency and Performance, Recovery.

- 1. Abraham Siberschatz and Peter Baer Galving "Operating System Concepts'
- 2. Milan Milankovic, "Operating Systems, Concept and Design" McGraw Hill
- 3. R. C. Joshi "Operating System", Wiley dreamtech India Pvt. Ltd.
- 4. Harvey M Ddeital "Operating System" Addison Wesley

SET/CSE/MCA/E304: Distributed Systems

INTRODUCTION: Definition of a Distributed system, Goal, Types of distributed System ARCHITECTURES : Architectural styles, System Architectures, Architectures versus Middleware, Self management in distributed systems PROCESSES: Threads, Virtualization, Clients, Servers, Code migration.

COMMUNICATION: Fundamentals, Remote Procedure Call, Message Oriented Communication, Stream oriented communication, Multicast communication. NAMING: Names, Identifiers and Addresses, Flat, Naming, Structured Naming, Attribute

based Naming, LDAP SYNCHRONIZATION: Clock Synchronization, Logical Clocks, Mutual Exclus

SYNCHRONIZATION: Clock Synchronization, Logical Clocks, Mutual Exclusion Global Positioning of nodes, Election Algorithms.

CONSISTENCY AND REPLICATION: Introductions, Data Centric Consistency Models, Client Centric Consistency Models, Replica Management, Consistency Protocols. FAULT TOLERANCE: Introduction to fault tolerance, Process resilience, Reliable Client Server Communication, Reliable group, Recovery

DISTRIBUTED FILE SYSTEMS: Architecture, Process Communication, Naming, Synchronization, Consistency and Replication, Fault tolerance, Security. DISTRIBUTED COORDINATION-BASED SYSTEMS: Introduction to coordination

models- Architectures, Processes communication, Synchronization, Consistency and Replication, Fault tolerance, Security.

- 1. Andrew S. Tanenbaum, Maarten Van Steen, "Distributed System: Principals and Paradigms", 2/E, PHI.
- 2. George Coulouris, Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", Fourth Edition, Pearson Education, 2005.
- 3. Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", PHI.
- 4. Galli D.L., "Distributed Operating Systems: Concepts and Practice", Prentice-Hall,2000

SET/CSE/MCA/E3045 Analysis and Design of Algorithms

Introduction: Algorithms, Analysis of Algorithms, Design of Algorithms, and Complexity of Algorithms, Asymptotic Notations, Growth of function, Recurrences. Sorting in polynomial Time: Insertion sort, Merge sort, Heap sort, and Quick sort Sorting in Linear Time: Counting sort, Radix Sort, Bucket Sort Medians and order statistics.

Elementary Data Structure: Stacks, Queues, Linked list, Binary Search Tree, Hash Table.

Advanced Data Structure: Red Black Trees, Splay Trees, Augmenting Data Structure Binomial Heap, B-Tree, Fibonacci Heap, and Data structure for Disjoint Sets. Union-find Algorithm, Dictionaries and priority Queues, mergeable heaps, concatenable queues.

Advanced Design and Analysis Techniques: Dynamic Programming, Greedy Algorithm, Backtracking, Branch-and-Bound, Amortized Analysis.

Graph Algorithms: Elementary Graph Algorithms, Breadth First search, Depth First search, Minimum Spanning Tree, Kruskal's Algorithms, Prim's Algorithms, Single Source Shortest Path, All pair Shortest Path, Maximum flow and Traveling Salesman Problem.

Randomized Algorithms, String Matching, NP-Hard and NP-Completeness Approximation Algorithms, Sorting Network, Matrix Operations, Polynomials and the FFT, Number Theoretic Algorithms.

- 1. Horowitz Sahani, "Fundamentals of Computer Algorithms." Galgotia
- 2. Coremen Leiserson etal, "Introduction to Algorithms", PHI
- 3. Brassard Brately, :Fundamental of Algorithms" PHI
- 4. M.T. Goodrich etal, "Algorithms Design" John Wiley
- 5. A.V. Aho etal. "The Design and analysis of Algorithms" Person Education
- 6. Algorithms and Data Structure: Boldwin Scragg, Wiley dreamtech

SET/CSE/MCA/E306: Theory of Computation

Introduction to the Theory of computation and Finite Automata: Mathematical preliminaries and Notation, three basic concepts, applications, deterministic Finite Acceptors, Nondeterministic finite acceptors, equivalence of Deterministic and Nondeterministic finite acceptors, reduction of the Number of states in Finite Automata.

Regular Languages, regular grammars and Properties of Regular Languages: regular expressions, connection between regular expressions and regular languages, regular grammars, closure properties of regular languages, elementary questions about regular languages, identifying language.

Contest-free languages and simplification of context-free grammars and normal forms: context-free grammars, parsing and ambiguity, context-free grammars and programming languages, methods of transforming grammars, two important normal forms.

Pushdown automata and properties of context-free languages: Nondeterministic pushdown automata, pushdown automata and context-free language, deterministic pushdown automata and deterministic context-free languages, two pumping lemmas, closure properties and decision algorithms for context-free language.

Turning machines and other models of turning machines: the standard turning machine, combining turning machines for complicated tasks, Turing's thesis, minor variation on the turning machine, combining turning machines, a universal turning machine.

References:

1. An introduction to Formal Languages and Automata, Peter Linz, Narasa publishing House, 1997.

- 2. Introduction to Languages and the Theory of Automata- John C Martin MGH 1997
- 3. Introduction to Automata Languages and Computation, J P Hopcroft. J D Ullman, Narosa Publication

SET/CSE/MCA/E307: Artificial Intelligence

Introduction: Definition and meaning of artificial intelligence, A.I. techniques, pattern recognition, Level of, speech recognition representation in A.I. properties of internal representation.

Production System: Different types of tracing, strategies, graph search strategies, Heuristic graph, search procedure, AND/OR graph, relationship between decomposional and compatible systems, searching Gate Tree, minmax search game playing, actual game playing.

Introduction to Predicate Calculus: Predicates and Arguments, connectives, Simplifications of strategies, extracting answers from Resolution Refutation. Control strategies.

Rule Based Deduction Systems: Forward and backward deduction system, resoling with AND/OR graph, computation, deduction and program synthesis, central knowledge for rules based deduct systems.

Managing Plans of Action: Plan interpreter, planning decisions, execution monitoring and re-planning domain of application robot motion planning and game playing.

Structural Object Representation: Semantic networks semantic market matching deductive operations on structured objects.

Architectural for A.I. Systems: Knowledge, acquisitions representation IMAGES PROCESSING, Natural language processing.

- 1. Introduction to artificial Intelligence Eugene Charnik Drew MC mott
- 2. Artificial Intelligence Elaine Rice.
- 3. Principal of Artificial Intelligence, Nelson, Springer-Verlag.
- 4. Artificial Intelligence Application Programming: Tim Jones, Wiley dreamtech

SET/CSE/MCA/E308: ERP System

Enterprise wide information system, Custom built and packaged approaches, Needs and Evolution of ERP Systems, Common myths and evolving realities, ERP and Related Technologies, Business Process Reengineering and Information Technology, Supply Chain Management, Relevance to Data Mining and OLAP, ERP Drivers, Decision support system.

ERP Domain, ERP Benefits classification, Present global and Indian Market scenario, milestones and pitfalls, Forecast, Market players and profiles, Evaluation criterion for ERP product.

ERP Life Cycle: Adoption decision, Acquisition, Implementation, Use and Maintenance, Evolution and Retirement phases, ERP Modules.

Framework for evaluating ERP acquisition, Analytical Hierarchy Processes (AHP), Applications of AHP in evaluating DRP, Selection of Weights, Role of consultants, vendors and users in ERP implementation; Implementation vendors evaluation criterion, ERP Implementation approaches and methodology, ERP Customization.

Critical success and failure factors for implementation, Model for improving ERP effectiveness, ROI of ERP implementation. Hidden costs, ERP success inhibitors and accelerators, Management concern for ERP success, Strategic Grid: Useful guidelines for ERP Implementations.

- 1. A. Lexis Leon, "Enterprise Resource Planning" TMH
- 2. Brady, Manu, Wegner, "Enterprise Resource Planning", TMH

SET/CSE/MCA/C401: Graphics and Animation

Graphics Primitives: Display Devices: Refresh Cathode Ray Tube, Raster Scan Display, Plasma display, Liquid Crystal display Plotters, Printers. Input Devices: Keyboard, Trackball, Joystick, Mouse, Light Pen, Tablet, and Digitizing Camera.

Input Techniques: Positioning techniques, Potentiometers, Constraints, Scales and Guidelines, Rubber-Band techniques, Dragging Dimensioning techniques and Graphical Potentiometers, Pointing and Selection: the use of selection points defining a boundary rectangle, multiple selections, Menu selection.

Mathematics for Computer Graphics: Point representation, Vector representation, Matrices and operations related to matrices, Vector addition and vector multiplication, Scalar product of two vectors, Vector product of two vectors.

Line Drawing Algorithms: DDA Algorithms, Bresenham's Line algorithm.

Segment and Display files: Segments, Functions for segmenting the display file, Posting and posting a segment, segment naming schemes, Default error conditions, Appending to segments, Refresh concurrent with reconstruction, Free storage allocation, Display file structure.

Graphics Operations: Clipping, Point Clipping, Line Clipping, Polygon Clipping. Filling: Inside Tests, Flood fill algorithm, Boundary-Fill Algorithm and scan-line polygon fill algorithm.

Conics, Curves and Surfaces: Quadric surfaces: Sphere, Ellipsoid, and Torus. Superquadrics: Superellipse, superellipsoid, Spline and Bezier Representations: Interpolation and approximation splines, parametric continuity conditions, Geometric Continuity Conditions, Spline specifications. Bezier curves and surfaces.

Transformation: 2D transformation, Basic Transformations, Composite transformations: Reflection, Shearing, Transformation between coordinate systems. 3D Graphics: 3D Display Methods, 3D transformations, Parallel projection, Perspective projection, Visible lines and surfaces identification, Hidden surface removal.

- 1. Donald Hearn and M Pauline Baker, "Computer Graphics" PHI
- 2. Steven Harrington, "Computer Graphics: A Programming Approach" TMH
- 3. Prajapati A.K. "Computer Graphics" PPM Ed2
- 4. Foley James D, "Computer Graphics" AW Ed2
- 5. Newman and Sprould, "Principle of to Interactive Computer Graphics" McGraw Hill
- 6. Rogers, "Procedural Elements of Computer Graphics", McGraw Hill
- 7. Rogers and Adams, "Mathematical Elements of Computer Graphics" McGraw Hill
- 8. Practical Multimedia "Nigel Chapman" Wiley dreamtech India Pvt Ltd.

SET/CSE/MCA/C402: Introduction to JAVA Programming

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 ,Exploring Java.lang, String handling ,Constructor, Garbage collection and finalize() method.

Inheritance, Packages and interface- Types of inheritance, Access specifiers class inheritance, using super, method overriding, Abstract class, constructor in multilevel inheritance, using final with inheritance, Dynamic method dispatch, Defining package, CLASSPATH, Access protection, Importing package, Defining and implementing interface, Extending interface, Nested interface.

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

Input Output and Networking : Byte stream and character stream ,Predefined stream, reading console input, writing consol output, PrintWriter class, Reading and writing files Networking – classes and interfaces, Socket and overview, TCP/IP client socket and server, Inet address, URL Connection, Datagram.

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.

- 1. Naughton P and schildt H. Java: The complete reference, Osborne Mcgra-Hill, Berkeley, USA, 1997.
- 2. Simply JAVA :An Introduction to JAVA programming By James R. Levenick ,Firewall Media publication New,Delhi
- 3. Balguruswami : Java Programming
- 4. Core JAVA for beginners by Rashmi Kanta Das ,Vikas Publication.

SET/CSE/MCA/E403: Multimedia Technology and Applications

Evolution of Multimedia and its objects, Scope of multimedia in business and work, production and planning of Multimedia applications. Multimedia hardware, Memory of Storage Devices, Communication Devices, Multimedia Software, Presentation and object generation tools, Video, sound, Image capturing Authoring Tools, Card and Page Based Authoring Tools.

Production and Planning of Multimedia building blocks, Text, sound (MIDI), Digital Audio, Audio File Formats, MIDI under Windows environment, Audio and Video Capture.

Macromedia products, Basic drawing techniques, Advance animation techniques, Creating Multi layer combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation. Digital Audio Concepts, Sampling variables, Loss Less compression, of

sound, Lossy compression and Silence compression.

Multimedia monitor bitmaps, Vector drawing, Lossy graphic compression, Image file formatic animations, Image standards, JPEG compression, Zig Zag coding. Video representation, colors, video compression, MPEG standards, MHEG standard, recent development in multimedia. Multimedia Application Planning, Costing, Proposal preparation, and Financing-Case study of a typical industry.

- 1. Andreas Halzinger, "Multimedia Basics" Vol-I to VOL-III Firewall Media
- 2. Tay Vaughan, "Multimedia Making It work" Tata McGraw Hill
- 3. Buford, "Multimedia Systems" Addison Wesley
- 4. Agarwal and Tiwari, "Multimedia Systems" Excel
- 5. Rosch, "Multimedia Bible" Sams Publishing
- 6. Digital Multimedia "Nigel Chapman" Wiley dreamtech India Pvt. Ltd.
- 7. Sleinreitz, "Multimedia Bible" Sams Publishing
- 8. Ken Milburn, John Ckroteau, "Flash 4 Web special Effects, Animation and Design Handbook" Dreamtech Press
- 9. John. Villamil-Casanova and Louis Molina, "Multimedia-Production, Planning and Delivery" PHI
- 10. Flash MX 2004 Bible: Robert , Wiley dreamtech India Pvt. Ltd.

SET/CSE/MCA/E404: Network Security and Cryptography

Introduction of Cryptography: Introduction To security: Attacks, Services and Mechanisms, Security, Attacks, Security Services, Conventional Encryption: Classical Techniques, Conventional Encryption Model, and steganography, Classical Encryption Techniques. Modern Techniques: Simplified DES, Block Cipher Principles, DES Standard, DES Strength, Differential and Linear Cryptanalysis, Block Cipher Design Principles, Block Cipher Modes of Operations.

Conventional Encryption Algorithms: Triples DES, Blowfish, International Data Encryption Algorithm, RCS, CAST-128, CR2 Placement and Encryption Function, Key Distribution, Random Number Generation, Placement of Encryption Function.

Public Key Encryption: Public-Key Cryptography: Principles of Public-Key Cryptosystems, RSA Algorithm, Key, Key Management, Fermat's and Euler's Theorm, Primality, Chinese Remainder Theorem.

Hash Functions: Message Authentication and Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Function Birthday Attacks, Security of Hash Function and MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signature, Authentication Protocol, Digital Signature Standard (DDS) Proof of Digital Signature Algorithm.

Network and System Security: Authentication Applications: Kerberos X-509, Directory Authentication Service, Electronic Mail Security, Pretty Good Privacy (PGP),S/Mine Security: Architecture, Authentication Header, Encapsulating Security Payloads, Combining Security Associations, Key Management, Web Security: Secure Socket Layer and Transport Layer Security, Secure Electronic Transaction (Set), System Security: Intruders, Viruses, Firewall Design Principles, Trusted Systems.

- 1. William Stallings, "Cryptography and Network Security: Principles and Practice" Prentice hall, New Jersey
- 2. Johannes A. Buchmann, "Introduction to Cryptography" Springer-Verlag
- 3. Atul Kahate, "Cryptography and Network Security" TMH
- 4. Network Security Bible : Eric Cole, Wiley dreamtech India Pvt. Ltd.
- 5. Practical Cryptography "Bruce Schneier" Wiley dreamtech India Pvt. Ltd.

SET/CSE/MCA/E405: Natural Language Processing

Regular expressions and automata, Morphology and Finite State transducers, $N-{\rm grams}.$

Word classes and part of speech tagging, Context free grammars for English, Parsing with context free grammars. Features and Unifications, Lexicalized and Probabilistic parsing.

Semantics: Representing meaning, Semantic analysis, Lexical semantics, Word Scene Disambiguation and Information retrieval.

Pragmatics: Discourse, Dialog and Conversational Agents, Natural Language Generation, Machine Translation.

References:

1. Daniel, Jurafsky and Martin, Speech and Language Processing, Pearson, 2003

SET/CSE/MCA/E406 : Unified Modeling Language

Introduction: The Evolution of Technology, Structured Analysis and Design, Object-Oriented Technologies, Comparison between the main technologies.

The Unified Process and Features: Unified Process, Static Structure: Process Representation, Dynamic Structure: iterative development, an architecturecentric process, A use-case-driven process, Use case models, Notations and Terminology.

Process Components (Workflows): Business Modeling Workflow, Requirement Workflow, Analysis and Design Workflow, Deployment workflow.

Understanding Object –Oriented Technologies, Current status of Object Technologies, The static object model- Class, Collaborations and Object Diagrams, Generalization, Composition, Aggregation, Multiplicity and Association with concept and examples.

Use Case Analysis: Discussion on use cases, terminology, notations and analysis, what they are and aren't, Use case- an example, Use case- formal Scenario template.

Static chart Diagram: Composite states, nested states, Events, Simple transitions.

UML Activity and sequence diagrams: Usage and Syntax, Guarded Transitions, Synchronization Bars, Swim lanes Purpose, Proper Usage of Activity diagram. Transition time sequence diagram: Objective and Modeling guidelines, Objective Interaction, Sequence diagram- UML notation, Object and Stereotypes.

- 1. UML distilled by Martin Fouler- Pearson Education.
- 2. Object -Oriented Modeling by James Raumbaugh, PHI.
- 3. UML a nutshell by Dan Pillone, O'Reilly Publication.
- 4. The elements of UML by Scott Amber, Cambridge University Press.
- 5. Designing Object-Oriented Software by Rebecca Wirf Brock, PHI.

SET/CSE/MCA/E407 : Computer Based Optimization Techniques

Preliminaries: Inventory Models and Replacement Problems: Inventory models, various costs deterministic inventory models, Single period inventory model with shortest cost, stochastic models, Application of inventory models, Economic lot sizes-price breaks, Replacement problems capital equipment discounting cost replacement in anticipation of failure group replacement-stochastic nature underlying the failure phenomenon.

Linear Programming Problems (LPP): Definition of LPP, Graphical Solutions of Linear Programming Problems, Simplex Method, and Artificial Variable Method, Two Phase Method, Big-M Method, Sensitivity Analysis, Revised Simplex Method, Duality, Dual Simplex Method.

Integer Linear Programming Problems: Integer Linear Programming Problems, Mixed Integer Linear Programming Problems, Cutting Plane Method, Branch and Bound Method, 0-1 integer linear programming problem.

Transportation Problems: Introduction to Transportation Model, Matrix Form of TP, Applications of TP Models, Basic Feasible Solution of a TP, Degeneracy in TP, Formation of Loops in TP, Solution Techniques of TP, Different Methods for Obtaining Initial Basic Feasible Solutions viz. Matrix Minima Method, Row Minima Method, Column Minima Methods, Vogel's Approximation Method, Techniques for Obtaining Optimal Basic Feasible Solution. Assignment Problems: Definition, Hungarian Method for AP.

Dynamic Programming: Bellman's Principle of optimality of Dynamic Programming, Multistage decision problem and its solution by Dynamic Programming with finite number of stages, Solution of linear programming problems as a Dynamic Programming problem.

- 1. Hadley, G. "Linear Programming and Masschusetts, Addison-Wesley
- 2. Taha, H.A. "Operations Research-An Introduction" Macmillian
- 3. Hiller, F.S., G.J. Lieberman "Introduction to Operations Research
- 4. Harvey M Wagner, "Principles of Operations Research with Applications to Managerial Decisions, Prentice Hall India Pvt. Ltd.
- 5. Swarup Ketal, "Operation Research" S.Chand

SET/CSE/MCA/E408 :: Wireless and Mobile Computing

Existing Wireless Systems: Introduction, Global System for Mobile Communications (GSM), Personal Communications Services (PCS), International Mobile Telecommunications 2000 (IMT-2000). Wireless local area networks. Wireless local loops.

Wireless and Mobile Computing: Overview of the history, evolution, and compatibility of wireless standards; the special problems of wireless and mobile computing.

Mobile Communication Systems: Introduction, mobile Internet protocol; mobile aware adaptation; extending the client-server model to accommodate mobility; mobile data access; the software packages to support mobile and wireless computing; Mobile/Cellular System Infrastructure, Registration, Handoff Parameters and Underlying Support. Roaming Support Using System Backbone. The role of middleware and support tools. performance issues; Multicasting, Security and Privacy.

Satellite Systems: Introduction, Types of Satellite Systems, Characteristics of Satellite Systems, Satellite System Infrastructures, Call Setup, Global Positioning System.

Recent Advances: Introduction, Ultra-Wideband Technology, Multimedia Services Requirements. Mobility Management for Integrated Systems; Multicast in Wireless Networks; MANET Route Maintenance/Repair; Design Issues in Sensor Networks; Bluetooth Networks; Threats and Security Issues.

- 1. Introduction to Wireless and Mobile Systems, Dharma P. Agrawal.
- 2. Internetworking with TCP/IP Vol.1: Principles, Protocols, and Architecture, 4/e, Comer, Douglas E., Prentice Hall.
- 3. Computer Networks and Internets with Applications, 3/e, Comer, Douglas E., PrenticeHall.
- 4. Computer Networking, Kurose and Ross, Addison-Wesley.
- 5. Data and Computer Communications 6th ed., Stallings William, Prentice-Hall.
- 6. Computer Networks 3rd ed., Tanenbaum, Andrew, Prentice-Hall.
- 7. Principles of Mobile Computing: Hansmann, Wiley dreamtech.
- 8. Mobile and Wireless design Essentials: Martyn Hallick, Wiley dreamtech.

SET/CSE/MCA/E409 :: Human- Computer Interaction

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design.

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

Software tools – Specification methods, interface – Building Tools.

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

- 1. Human Computer Interaction. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, Pearson Education
- 2. Interaction Design Prece, Rogers, Sharps. Wiley Dreamtech,
- 3. User Interface Design, Soren Lauesen, Pearson Education.

SET/CSE/MCA/E410 :: Image Processing

Introduction: Digital Image Processing, The origins of Digital Image Processing, Examples of Digital Image Processing application, Fundamental steps in Digital Image processing, Components of Image Processing system Fundamentals: Elements of Visual Perception, Light and Electromagnetic Spectrum, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships between Pixels, Linear and Nonlinear Operations.

Image Enhancement in the spatial domain: Background, Some basic gray level transformation, Introduction of Histogram processing, Enhancement using Arithmetic/Logic operations, Basics of spatial filtering, Smoothing spatial filters, Sharpening spatial filters, Image Enhancement in the Frequency Domain : Introduction.

Image Restoration: Model of the Image Degradation/Restoration process, Noise Models, Restoration in the presence of noise only spatial filtering, Inverse filtering, Minimum Mean Square Error (Wiener) filtering, Geometric mean filter, Geometric Transformations, Image Compression: Fundamentals, Lossy Compression, Lossless Compression, Image Compression models, Error-free Compression : Variable length coding, LZW coding, Bit plane coding, Run length coding, Introduction to JPEG.

Morphology: Dilation, Erosion, Opening and Closing, Hit-and Miss transform, Morphological Algorithms : Boundry Extraction, Region filling, Extraction of connected components, Convex Hull,

Image Segmentation: Definition, characteristics of segmentation Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region based segmentation. Introduction to Representation and Description, Introduction to Object Recognition.

- 1. Digital Image Processing: Rafael C. Gonzalez and Richard E. Woods. Addision Wesley.
- 2. Fundamentals of Digital Image Processing. Anil K. Jain, PHI.
- 3. Digital Image Processing and Analysis : B. Chanda and D. Dutta Majumber, PHI.
- 4. Image Processing in C : Dwayne Phillips, BPB.

SET/CSE/MCA/E411 : Compiler Designing

Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler.

Programming Language: High level languages, lexical and syntactic structure of a language, Data elements, Data Structure, Operations, Assignments, Program unit, Data Environments, Parameter Transmission. Lexical Analysis: The role of Lexical Analyzer, A Simple approach to the design of Lexical Analyzer, Regular Expressions, Transition Diagrams, Finite state Machines, Implementation of Lexical Analyzer, Lexical Analyzer Generator: LEX, Capabilities of Lexical Analyzer.

The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of EFG.

Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive descent Parsers, Predictive Parser, Bottom-up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC

Intermediate Code Generation: Different Intermediate forms: Three address code, Quadruples and Triples, Syntax Directed Translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postifix translation.

Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management.

Error Detection and Recovery: Lexical phase errors. Syntactic phase errors, semantic errors.

Code Optimization and Code Generation: Local optimization, Peephole optimization, Basic blocks and flow Graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection.

- 1. Alfred V Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa
- 2. A.V. Aho, R. Sethi and J.D.Ullman, "Compiler Principle, Tech and tools" AW
- 3. H.C. Holub "Compiler Design in C", Printice Hall Inc.
- 4. Apple, "Modern Computer Implementation in C: Basic Design" Cambridge Press
- 5. Modern Compiler Design: Dick Grune, Wiley dreamtech India Pvt. Ltd.
- 6. Starting Out with Modern Compiler "David Gaddis Wiley dreamtech India Pvt. Ltd.

SET/CSE/MCA/C501: Management Information System

Management Information System : Definition, MIS as an evolving concept, MIS and other Academic Disciplines, Subsystems of an MIS.

Structure of MIS : Elements of an Information System, MIS support for Decision making, MIS Structure.

Hardware, Software, and communications Technology for Information Systems.

System and Design : Systems Development Initiative, Different Methodologies - Life Cycle and Prototype approach, Detailed study on Life Cycle Design and Implementation. Case Study.

Managerial Decision Making : Decision Making Process, Group Decision Support Systems, Architecture of GDSS, Categories of GDSS.

Decision Support System : Definition and Components of DSS (Data Base Management System, Model Base Management System, Support Tools), Applications of DSS, Functions of DSS.

A study of Computerization in different functional areas of a typical manufacturing/business organization i.e Marketing, production, material, financial, personal.

References:

1. Management Information Systems Gordon B. Davis and Margerethe H. Olson Mc-Graw-Hill

SET/CSE/MCA/C502: Unix and Shell Programming

Basic Unix Commands: The Unix editors and vi; Redirection, Piping, Tees and filters; The Unix Utilities grep, sed, etc.

Overview of Unix Architecture: The kernel and the Shell; Processes and Time Sharing files and Directories; Peripheral Device as files.

Introduction the Shell Scripts: The Bourne and C-shells; Shell variables, scripts meta-characters and environment; the if and case statements; for, while and until loops.

System calls and the 'C' library: Discussion of the Unix system calls and 'C' library functions, the standard I/O Package; file handling; math library; command line parameters etc. The Unix 'C' interface; 'C' files and Graphics.

Introduction of systems Administration under Unix: The system Manger OLE and functions.

Different Tools: Debugging language development, System development different print formatting UNIX Tools.

Bourne Shell: Shell meta characteristics, shell variable, scripts, facilities, commands and environments, shell archive, idea about restricted shell, ROLC program.

Korn Shell: Shell variables and scripts, built in EDITOR, built in integer arithmetic, string manipulation capabilities, Command Aliasing, Array Job control.

C-Shell: Shell variables and scripts, shell facilities, history Integer Arithmetic Decision making and job control.

References:

1. Stephan Prata: Advanced Unix - A Programmers Guide - BPB PUB.

- 2. Kernighlan and Pike : The Unix Programming Environment PHI.
- 3. The Unix System Manuals.

SET/CSE/MCA/C503: Data Mining

Introduction to data mining, need for data warehousing and data mining, application potential, keywords and techniques. Data Warehousing and Online analytical Processing (OLAP): Aggregation operations, models for data warehousing, star schema, fact and dimension tables , conceptualization of data warehouse and multidimensional databases, Relationship between warehouse and mining.

Data mining primitives: Data preprocessing, data integration, data transformation. Definition and specification of a generic data mining task. Description of Data mining query language with examples. Association analysis: Different methods for mining association rules in transaction based data bases. Illustration of confidence and support. Multidimensional and multilevel association rules. Classification of association rules. Association rule algorithms – A priori and frequent pattern growth.

Classification and Prediction: Different classification algorithms. Use of genie index, decision tree induction, Bayesian classification, neural network technique of back propagation, fuzzy set theory and genetic algorithms. Clustering: Partition based clustering, hierarchical clustering, model based clustering for continuous and discrete data. Scalability of clustering algorithms. Parallel approaches for clustering.

Web mining: Web usage mining, web content mining, web log attributes. Data mining issues in object oriented data bases, spatial data bases and multimedia data bases and text data bases.

References:

1. J. Han, M. Kamber, "Data Mining Concepts and Techniques", Harcourt India Pvt Ltd, 2001

- 2. M. Dunham, "Data Mining : introductory and Advanced Topics", Pearson Pub, 2003
- 3. A.K. Pujari, "Data Mining Techniques", Universities Press.

SET/CSE/MCA/C504: E-Commerce

Introduction: Electronic Commerce - Technology and Prospects, Definition of E-Commerce, Economic potential of electronic commerce, Incentives for engaging in electronic commerce, forces behind E-Commerce, Advantages and Disadvantages, Architectural framework, Impact of E-Commerce on business.

Network Infrastructure of E-Commerce: Internet and Intranet based E-Commerce Issues, problems and prospects, Network Infrastructure, Network Access Equipments, Broadband telecommunication (ATM, ISDN, FRAME RELAY).

Mobile Commerce: Introduction, Wireless Application Protocol, WAP Technology, Mobile Information device, Mobile Computing Applications.

Web Security: Security Issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network Security, Factors to consider in Firewall design, Limitation of Firewalls.

Encryption: Encryption techniques, Symmetric Encryption-Keys and data encryption standard, Triple encryption. Asymmetric encryption-Secret key encryption, public and private pair key encryption, Digital Signature, Virtual Private Network.

Electronic Payments: Overview, The SET protocol, payment Gateway, certificate, digital Tokens, Smart card, credit card, magnetic strip card, E-Checks, Credit/Debit card based EPS, online Banking EDI Application in business, E-Commerce Law, Forms of Agreement, Govt. policies and Agenda.

- 1. Ravi Kalakota, Andrew Winston, :Frontiers of Electronic Commerce" Addison Wesley.
- 2. Bajaj and Nag. "E-Commerce the cutting edge of Business". TMH.
- 3. P. Loshin, John Vacca, "Electronic Commerce" Firewall Media, N.Delhi.
- 4. E Business and Commerce: Brahm Cazner, Wiley dreamtech.

SET/CSE/MCA/E505: ASP.NET

Introduction to ASP: Introduction to ASP. Types of Path. Examples using Response object of ASP. Working with FORM tag. Important Points about the FORM submission. Problem with ASP.

Validation Controls: BaseValidator, ValidationSummary, RequiredFieldValidator, CompareValidator, RangeValidator, RegularExpressionValidator, CausesValidation Property of Button, Grouping Controls for Validation

Applying Themes and Styles to Controls : Working with CSS ,Using Themes to Customize a Site , Named Skins within a Theme, Server-side Styles using Themes , Contents of a Theme and Skin, Themes and Profiles

ASP.NET Architecture: What is AppDomain, Life cycle of a WebForm when requested by a client., How does a control manages its state, EnableViewState property, Event Handling in WebForms, Writing / Using Custom Classes in WebApplication

Page Navigation Options: Response.Redirect, Server.Transfer, CrossPagePostBack property of Button a. Accessing controls of PreviousPage b. Accessing Properties of PreviousPage c. PreviousPageType page directive

Creating a Layout Using Master Pages: Why Master Pages. , Significance of ContentPlaceHolder Tag in MasterPage and Content Tag in WebForm. How a control of MasterPage can be accessed / programmed in WebForm. a. Master.FindControl b. Public property in MasterPage and <%@MasterType directive in WebForm. Load and LoadComplete events of the Page and MasterPage classes. Understanding ClientID and UniqueID properties.

- 1 Xue Bai, Michael Ekedah, The Web Warrior Guide to Web Programming, Thomson (2006)
- 2 Kogent Solutions Inc .Net Programming Black Book, Dream Tech (2008)
- 3 Joe Duffy Professional.Net Programming 2.0 Wiley
- 4 George Stepherd ASP.NET 3.5 Microsoft PHI (2008)

SET/CSE/MCA/E506: Visual Programming

WINDOWS PROGRAMMING: The windows programming Model, Event driven programming, GUI concepts ,Overview of Windows programming, Creating and displaying the window, Windows procedure , Window messages and Message Loop, Resources, An Introduction to GDI, Device context.

INTRODUCTION TO VC++ and MFC: IDE, resource editor, resource files, Application wizard and class wizard, message handling, tools in VC++, DLL and API, Message, User, GDI and kernel, MFC fundamentals, Structure of MFC applications, Creating Main window using MFC.

VC++ APPLICATIONS : Introduction to building a basic application, getting started with Visual C++, reading Keystrokes from keyboard, Centering text in a window, Adding a Caret to a window, handling mouse in VC++, creating menus, Toolbars buttons.

COMPONENT OBJECT MODEL (COM) : Introduction to OLE, OLE feature and specifications, Container, Embedding objects, Introduction to COM and DCOM, DDE to COM+, COM+ features, Features in Windows 2000, Transactions and queues- MTS and MSMQ, Types of program file-Com, EXE, DLL and other types of files.

ADVANCE VC++ : , Program execution control- process and thread, multithreading, Synchronization, Creating Internet Programs- including a Web Browser, Building and Using Active X controls in VC++, Data Access Objects (DAO), ActiveX Data Objects (ADO), Open Database Connectivity (ODBC), Database Building Overview, Building a simple Database Applications

Reference Books

- 1. Murray, et.al "The Visual C++ Handbook", 2nd edition. Osborne MCGraw Hill, New York, 1996.
- 2. Visual C++ 6 programming in Record Time, Steve Holzner, BPB Publications.
- 3. VC++ 6 Programming Bible, Wiley dreamtech India Pvt. Ltd.
- 4. Windows Programming by Herbett Schildtz, TMH.
- 5. Windows Programming by Charles Petzold, Microsoft Press.
- 6. COM/DCOM Primer Plus by Waite Group (Techmedia).
- 7. Visual Basic Developer's Guide to COM and COM+, Wayne S. Freeze, BPB Publications.