SYLLABUS

FOR

M.Sc. (IT) Programme

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

H.N.B. GARHWAL UNIVERSITY
(A Central University)
Regulations, Curricula, Syllabus and Scheme of Examinations (Credit and Semester System)
M.Sc. (IT)
(With effect from session 2015-2016)

1. **Duration** of the M.Sc. (IT) program shall be 2 years, divided into 4 semesters. Each semester should have 15 – 18 weeks.
2. Eligibility for admission: Bachelors Degree in Science from any University recognized by UGC.
3. **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 four semester M.Sc. (IT) programme is 72.
4. **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.
5. **End Semester Assessment:**
    (a) Question pattern (Theory part): There shall be *eight questions carrying equal marks*. Each question may contain sub divisions also. Student has to answer any four full questions.
    (b) Question pattern (Practical part): One compulsory question that may contain sub divisions is to be attempted by the student.
6. **Grading:**

    As per University/UGC norms.
7. **Grade Card**
    7.1 The university under its seal shall issue to the students a grade card on completion of each semester and a consolidated grade statement at the end of the M.Sc. (IT).
    7.2 Grade card shall contain the following.
        a. Title of the courses.
        b. The credits associated with and grades awarded for each course.
        c. The number of credits earned by the student and the grade point average.
        d. The total credits earned by the student till that semester.
    7.3 The grade card issued on completion of the programme shall contain the name of the programme, the department / school offered the programme, the titles of the courses taken, the credits associated with each course, grades awarded, the total credits earned by the student, the CGPA and the class in which the student is placed.
8. **Ranking**

    Only those candidates who have passed all the papers in the first appearance within the minimum period will be considered for ranking on the basis of CGPA for the entire course.
9. **Attendance:** Will be applied as per university norms.
10. **Scrutiny shall be allowed as per the rules of the University.** Revaluation is not permitted.

H. N. B. Garhwal University Srinagar Garhwal
M. Sc. (Information Technology)

Programme Structure

SEMESTER - I

SET/CSE/MIT/C101 : Computer Fundamentals & Programming in 'C'

SET/CSE/MIT/C102 : Mathematical Foundation of Computers Science

SET/CSE/MIT/C103 : Digital Electronics & Computer System Architecture

SET/CSE/MIT/C104 : Structured System Analysis and Design

SET/CSE/MIT/C105 : Accounting and Financial Management

SET/CSE/MIT/CP11 : Computer Programming & Problem Solving in 'C'

SET/CSE/MIT/CP12 : PC Packages(Introduction to DOS & MS-office)

SEMESTER - II

SET/CSE/MIT/C201 : Data Structures Using 'C'

SET/CSE/MIT/C202 : Relational Database Management Systems

SET/CSE/MIT/C203 : Operating System

SET/CSE/MIT/C204 : Software Engineering and Project Management

SET/CSE/MIT/C205 : Object Oriented Analysis and Designing

SET/CSE/MIT/CP21 : Data Structures Using 'C'

SET/CSE/MIT/CP22 : Relational Database Management Systems

SET/CSE/MIT/SS21 :Self Study*

SEMESTER - III

SET/CSE/MIT/C301 : Introduction to Web Technology

SET/CSE/MIT/C302 : Data communication and Networks

SET/CSE/MIT/C303 : Analysis & Design of Algorithm

SET/CSE/MIT/E1: Elective I

SET/CSE/MIT/E2: Elective II

SET/CSE/MIT/EP31: Elective I

SET/CSE/MIT/EP32: Elective II

SET/CSE/MIT/SS31 :Self Study*

SEMESTER – IV

SET/CSE/MIT/E3: Elective III

SET/CSE/MIT/E4: Elective IV

SET/CSE/MIT/EP41: Elective III

SET/CSE/MIT/PR41: Project

SET/CSE/MIT/SS31 :Self Study*

FIRST SEMESTER:

S.No	Course No.	Subject	L	T	P	TA	CT	TOT	ESE	Sub. Total	Credit
			Period			Sessional			Examination		
Theory											
1.	SET/CSE/MIT/C101	Computer Fundamental & Programming in 'C'	3	-	-	10	30	40	60	100	3
2.	SET/CSE/MIT/C102	Mathematical Foundation of Computer Science	3	-	-	10	30	40	60	100	3
3.	SET/CSE/MIT/C103	Digital Electronics & Computer System Architecture	3	-	-	10	30	40	60	100	3
4.	SET/CSE/MIT/C104	Structured System Analysis and Design	2	-	-	10	30	40	60	100	2
5.	SET/CSE/MIT/C105	Accounting and Financial Management	3	-	-	10	30	40	60	100	3
Practical											
1.	SET/CSE/MIT/CP11	Computer Programming & Problem Solving in 'C'	-	-	3	40	-	40	60	100	2
2.	SET/CSE/MIT/CP12	PC Packages(Introduction to DOS & MS-office)	-	-	3	40	-	40	60	100	2
		Total	**14**	**-**	**6**	**130**	**150**	**280**	**420**	**700**	**18**

SECOND SEMESTER:

S.No	Course No.	Subject	L	T	P	TA	CT	TOT	ESE	Sub. Total	Credit
			Period			Sessional			Examination		
Theory											
1.	SET/CSE/MIT/C201	Data Structures Using 'C'	3	-	-	10	30	40	60	100	3
2.	SET/CSE/MIT/C202	Relational Database Management System	3	-	-	10	30	40	60	100	3
3.	SET/CSE/MIT/C203	Operating System	3	-	-	10	30	40	60	100	3
4.	SET/CSE/MIT/C204	Software Engineering and Project Management	2	-	-	10	30	40	60	100	2
5.	SET/CSE/MIT/C205	Object Oriented Analysis and Design	3	-	-	10	30	40	60	100	3
Practical											
1.	SET/CSE/MIT/CP21	Data Structures Using 'C'	-	-	3	40	-	40	60	100	2
2.	SET/CSE/MIT/CP22	Relational Database Management Systems	-	-	3	40	-	40	60	100	2
		Total	**14**	**-**	**6**	**130**	**150**	**280**	**420**	**700**	**18**
1.	SET/CSE/MIT/SS21	Self Study	2	1	-	-	-	-	-	-	3

TA   : Teacher Assessment
CT   : Class Test
ESE   : End Semester Examination
SUB TOT. : Subject Total
TOT.   : Total

THIRD SEMESTER:

S.No	Course No.	Subject	Evaluation – Scheme								Credit
			Period			Sessional			Examination		
			L	T	P	TA	CT	TOT	ESE	Sub. Total	
Theory											
1.	SET/CSE/MIT/C301	Introduction to Web Technology	2	-	-	10	30	40	60	100	2
2.	SET/CSE/MIT/C302	Data Communication and Networks	3	-	-	10	30	40	60	100	3
3.	SET/CSE/MIT/C303	Analysis & Design of Algorithm	3	-	-	10	30	40	60	100	3
4.	SET/CSE/MIT/E1	Elective I	3	-	-	10	30	40	60	100	3
5.	SET/CSE/MIT/E2	Elective II	3	-	-	10	30	40	60	100	3
Practical											
1.	SET/CSE/MIT/EP31	Elective I	-	-	3	40	-	40	60	100	2
2.	SET/CSE/MIT/EP32	Elective II	-	-	3	40	-	40	60	100	2
		Total	**14**	**-**	**6**	**130**	**150**	**280**	**420**	**700**	**18**
1.	SET/CSE/MIT/SS31	Self Study	2	1	-	-	-	-	-	-	3

FOURTH SEMESTER:

S.No	Course No.	Subject	Evaluation – Scheme								Credit
			Period			Sessional			Examination		
			L	T	P	TA	CT	TOT	ESE	Sub. Total	
Theory											
1.	SET/CSE/MIT/E3	Elective III	3	-	-	10	20	30	70	100	3
2.	SET/CSE/MIT/E4	Elective IV	3	-	-	10	20	30	70	100	3
Practical											
1.	SET/CSE/MIT/EP41	Elective III	-	-	3	30	-	30	70	100	2
2.	SET/CSE/MIT/PR41	Project	-	2	12	-	-	-	400	400	10
		Total	**6**	**2**	**15**	**50**	**40**	**90**	**610**	**700**	**18**
1.	SET/CSE/MIT/SS41	Self Study	2	1	-	-	-	-	-	-	3

TA   : Teacher Assessment
CT   : Class Test
ESE   : End Semester Examination
SUB TOT. : Subject Total
TOT.   : Total

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Elective I
(Choose any one)

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E1.1	Computer Graphics
E1.2	Internet Technology
E1.3	Programming in JAVA

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Elective II

(Choose any one)

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E2.1	Programming in Visual Basic
E2.2	Advanced RDBMS
E2.3	Distributed and Parallel Computing

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Elective III

(Choose any one)

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E3.1	C#
E3.2	ASP.Net
E3.3	Multimedia Technology and Applications

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Elective IV

(Choose any one)

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E4.1	Artificial Intelligence
E4.2	E-Governance
E4.3	Fuzzy Logic & Neural Network
E4.4	Software Project Management

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*Self Study
(Choose any one for semester II, III& IV)

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Knowledge Based Decission Support System	Human Interface System
Cloud Computing	Wireless Networks
Ethical Hacking	Linux Internals
Geographic Information System	Natural Language Processing

SET/CSE/MIT/C101 : Computer Fundamentals & Programming in 'C'

Introduction to Computers: Computer hardware Components, Disk Storage, memory, keyboard, mouse, printers, monitors, CD etc., and their functions, Comparison Based analysis of various hardware components.

Basic Operating System Concepts: MS-DOS, WINDOWS, Functional knowledge of these operating systems. Introduction to Basic Commands of DOS, Managing File and Directories in various operating Systems, Introduction to internet, Basic terms related with Internet, TCP/IP.

Programming in C: History, Introduction to C Programming Languages, Structure of C programs, compilation and execution of C programms. Debugging Techniques, Data Types and Sizes, Declaration of variables, Modifiers, Identifiers and keywords, Symbolic constants, Storage classes (automatic, external, register and static), Enumerations, command line parameters, Macros, The C Preprocessor
Operators: Unary operators, Arithmetic & logical operators, Bit wise operators, Assignment operators and expressions, Conditional expressions, precedence and order of evaluation. Control Statements: if-else, switch, break, continue, the comma operator, go to statement.Loops: for, while, do-while.

Functions: built-in and user-defined, function declaration, definition and function call, parameter passing: call by value, call by reference, recursive functions, multifile programs.
Arrays: Linear arrays, multidimensional arrays, Passing arrays to functions, Arrays and strings.
Structure and Union: Definition and differences, self-referential structure. And address of (&) operator, pointer to pointer, Dynamic Momory Allocation, calloc and malloc functions, array of pointers, function of pointers, structures and pointers.

References:
1. V. Rajaraman, "Fundamentals of Computers", PHI
2. Pater Norton's "Introduction to Computer", TMH
3. Hahn, "The Internet complete reference", TMH
4. Peter Nortton's, "DOS Guide", Prentice Hall of India
5. Gottfried, "Programming in C, Schaum's Series Tata McGraw Hill

SET/CSE/MIT/C102 : Mathematical Foundation of Computers 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.

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.

References:

1. Liptschutz, Seymour, "Discrete Mathematics", TMH.
2. Trembley, J.P. & 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. Kumar Rajendra, "Theory of Automata: Languages and Computation", PPM
7. Hopcroft J.E. Uliman J.D., "Introduction to Automata Theory, Language and Computation" Narosa Pub. House, New Delhi.
8. C.L.Liu "Elements of Discrete Maehmatics", McGraw Hill.
9. Peter Grossman, "Discrete Mathematics for Computer", Palgrave Macmillian.

SET/CSE/MIT/C103 : Digital Electronics & Computer System Architecture

Representation of information & Basic Building Blocks: Introduction to Computer, Computer hardware generation, Number System: Binary, Octal, Hexadecimal, Character Codes (BCD), ASCII, EBCDIC and their conversion. Logic gates, Boolean Algebra, K-map simplification, Half Adder, Full Adder, Subtractor, Decoder, Encoders, Multiplexer, Demultiplexer, Carry look ahead adder, Combinational logic Design, Flip-Flops, Registers, Counters (Synchronous and asynchronous), ALU, Micro-operation. ALU-chip, Faster Algorithm and Implementation (multiplication & Division).

Basic Organization: Operational flow chart (Fetch, Execute, Instruction Cycle), Organization of Central Processing Unit, Hardwired & micro programmed control unit, Single Organization, General Register Organization, Stack Organization, Addressing modes, Instruction formats, data transfer & Manipulation, I/O Organization, Bus Architecture, Programming Registers.

Memory Organization: Memory hierarchy, Main memory (RAM/ROM) chips), Auxiliary memory, Associative memory, Cache memory, Virtual memory, Memory Management Hardware, hit/miss ratio, magnetic disk and its performance, magnetic Tape etc.

I/O Organization: Peripheral devices, I/O interface, Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor, and Serial Communication. I/O Controllers, Asynchronous data transfer, Strobe Control, Handshaking.

References:

1. Willam Stalling, "Computer Organization & Architecture" Pearson Education Asia
2. Mano Morris, "Computer System Architecture" PHI
3. Zaky & Hamacher, "Computer Organization: McGraw Hill
4. B. Ram, "Computer Fundamental Architecture & Organization" New Age
5. Tannenbaum, "Structured Computer Organization" PHI.

SET/CSE/MIT/C104 : Structured 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 & 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 & Maintenance.

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

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

References:

1. Elias M.Awad, "Systems Analysis & Design" Galgotia Publication
2. Hoffer, "Modern Systems Analysis & Design" Addision Wesley
3. Kendall, "Introduction to System Analysis & Desogm", McGraw Hill

SET/CSE/MIT/C105 : Accounting and Financial Management

Accounting: Principles, Concepts and conventions, double entry system of accounting, Ledger posting and Trial balance. Final Accounts: Trading, profit and loss accounts and balance sheet of sole proprietary concern with normal closing entries. Introduction to manufacturing account of partnership firms, limited company.

Financial Management: Meaning, role and scope of financial Management. Basic Financial Concepts: Time value of Money, present value, future value of a series of cash flows, annuity, Practical applications of compounding and present value techniques. Long-term source of finance: Introduction to shares, debenture, preference shares.

Capital Budgeting: Meaning, importance, difficulties, Introduction to evaluation techniques - Traditional techniques (ARR Payback method). Discounting cash flow techniques (Present value, NPV, IRR) Ratio Analysis: Meaning, advantages, limitations of ratio analysis, Types of ratios and their usefulness.

Costing: Nature, importance and Types of cost Marginal costing: Nature, scope and importance of marginal costing. Break-even analysis, its uses and limitations, construction of break-even charts. Practical applications of marginal costing. Inventory Control System: The need cost of inventory, methods of inventory costing.

Introduction to Computerized Accounting System: Coding logic and codes required, master files, transaction files, introduction to documents used for data collection. Processing of different files and outputs obtained.

References:

1. S.N. Maheswari & S.K. Maheshwari, "Introduction of Fincncial Accountancy"   Vikas Pulication.
2. S.N. Maheshwari & S.K. Maheshwari, "Advanced Accountancy" Vikas Pub.
3. S.N. Maheshwari & S.K. Maheshwari "Financial Management, Vikas Pub.
4. Jawahar Lal "Financial Accounting" Wheelder publishing
5. Khan & Jain "Management Accounting" Tata McGraw Hill publication
6. K.S. Sastry & Nand Dhamesa, "The practices of Mgmt. Accounting, Wheeled Publications.
7. I.M. Pandey "Financial Management" Vikas Publication.
8. J.Khan & Jain "Financial management" Tata McGraw Hill Publication
9. Geoffrey Knott "Financial Management" Palgrve Macmillan.

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SET/CSE/MIT/C201 : Data Structures Using 'C'

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, Linked Representation of stack, Operations Associated with Stacks, Application 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, simulating recursion Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

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, Binary Search Trees: Binary Search (BST), Insertion and Deletion in BST, Complexity of search Algorithm, Path Length, 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, B+ Tree index Files B Tree index Files, Indexing and Hashing Comparisons.

References:

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 & 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

SET/CSE/MIT/C202 : Relational Database Management Systems

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 & 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

Transaction Processing Concepts: Transaction system, Testing of seralizability, Seralizability of schedules, conflict and view seralizable schedule, recoverability, Recovery form transaction failures, deadlock handling .

 Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control.

References:

1. Date C.J. "An Introduction to Database System". Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts" McGraw Hill
3. Elmasri, Navathe, "Fundamentals of Database Systems" Addision Wesley
4. Paul Beynon Davis, "Database Systems" Palgrave Macmillan
5. Bipin C. Desai, "An introduction to Database Systems", Galgotia Pub.

SET/CSE/MIT/C203: Operating System

Introduction: Definition and Types of operating systems, Batch Systems, multi programming, time-sharing parallel, distributed and real-time systems, Operating system structure, Operating system components and services, System calls, system programs, Virtual machines.

Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Interprocess communication, CPU scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real-time scheduling and Algorithm evaluation.

Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Recovery from deadlock, Combined approach to deadlock handling.

Storage Management: Memory Management-Logical and Physical Address Space Swapping, Contiguous Allocation, Paging Segmentation with paging in MULTICS and Intel 386, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing, Page size and other considerations, Demand segmentation, File systems, secondary storage structure, File concept, access methods, directory implementation, Efficiency and performance, recovery, Disk structure, Disk scheduling methods, Disk management, Recovery, Disk structure, disk scheduling methods, Disk management, Swap-Space management, Disk reliability.

Security & Case Study: Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, Revocation of Access Rights, Language based protection, The security problem, Authentication, One time passwords, Program threats, System threats, Threat Monitoring, Encryption.

References:

1.   Abraham Siberschatz & Peter Baer Galving "Operating System Concepts'
2.   Milan Milankovic, "Operating Systems, Concept & Design" McGraw Hill
3.   Harvey M Ddeital "Operating System" Addison Wesley
4.   R. C. Joshi "Operating System"

SET/CSE/MIT/C204 : Software Engineering and Project Management

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 & 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 & Quality Assurance: Reliability issues, Reliability metrics, Reliability growth modeling, Software quality, ISO 9000 Certification for software industry, SEI capability maturity model, comparison between ISO & 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.

References:

1. Pressman, Roger S., "Software Engineering: A Practitioner's Approach Ed.   Boston: McGraw Hill, 2001

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

SET/CSE/MIT/C205 : Object Oriented Analysis and Designing

Object modeling: Objects and classes. Links and associations. Generalization and inheritance. Grouping constructs. Aggregation. Generalization as extension and restriction. Multiple inheritance. Meta data, candidate keys. Dynamic modeling: Events and states Nesting. Concurrency. Functional modeling : Data flow diagrams. Specifying operations.

Analysis: Object modeling. Dynamic modeling, functional modeling. Adding operations. Iteration.

System design: Subsystems. Concurrency. Allocation to processors and tasks. Management of data stores. Control implementation. Boundary condition. Architectural frameworks. Object design: Optimization, implementation to control. Adjustment of inheritance. Design of associations. Documentation. Comparison of methodologies.

Implementation: Using a programming language, a database system. Programming styles. Reusability, extensibility, robustness, programming-in-large, case study.

References:

1. Booch, G.   : Object Oriented Analysis and Design, 2nd Edition.
2. Rebecca Wirfs-Brock, et. al : Designing Object Oriented Software", PHI.
3. Rumbaugh, J., Object Oriented Modeling and Design , Prentice Hall of India..
4. P.M. Chilean: Programming in C++ Merril Pub. 1990.
5. E.R. Tello   : Object Oriented Programming of A.I. Addison Wesley Pub. Co.

SET/CSE/MIT/C301 : Introduction to Web Technology

Introduction: History of web, growth of web, the past decade, protocols governing the web, web applications, development of the web in India, creating web sites for individuals and corporate world, introduction to cyber law of India, international cyber laws.

Web development Strategies: Web projects, writing web project, identification of objects, target users, web team, assessment of web team, team dynamics, planning and process development, early planning, contents, technical and production planning, communication issues.

Communication with clients, communication breakdowns, development of multi-department & large scale sites, quality assurance & testing, study of technological advances and impact of web teams.

Design strategies for E-commerce site development: Basic foundation in e-commerce system, creating forms, managing database through web.

Java Programming: Introduction, Operator, Data types, Variables, Methods and Classes, Multi threaded programming, I/O Java applet.

Java Library: String handling, I/O exploring JAVA, Networking, Applet Classes, Event Handling, Introduction to AWT, Working with windows, Graphics, AWT Controls, Layout manager and menu, Images, Additional Packages.

Software Development Using Java: Java Bean, Java Swing, Java Servlets, Migrating from C++ to Java, Application of JAVA, Dynamic Billboard Applet.

Image Menu: An image based menu, Lavatron Applets, Scrabblets JDBC, Brief functioning of Upper Layer E-mail and their applications.

References:

1. Sharma & Sharma, " Developing E-commerce sites", Addition Wesley

2. Burdman, " Collaborative Web Development" Addison Wesley

3. Margarel Leving Young."The complete Reference Internet" TMH

4. Naughton, Schidt, "The Complete Reference JAVA2", TMH

5. Balagurusamy E, "Programming in JAVA, TMH

6. Dustin R. Calway, "Inside Serviets" Addison Wesley

7. Mark Wutica, "Java Enterprise Edition" QUE

8. Steven Hoizner, "Java2 Black book" Dreamtech

SET/CSE/MIT/C302 : Data communication and Networks

Introduction to Computer Networking: Use, advantage, structure of the communications network topologies the telephone network, analog to digital communication.

Communication Between Analog Computers & Terminals Layered Protocols, Network & The OSI Models, Traffic control and accountability wide area and local area networks, connection oriented and connectionless networks, classification of communication protocols polling/selection systems, non-priority system priority system, rotation for layered protocols foals of layered protocols, network design problems, communication between layers, A parametric illustration, introduction to standards organizations and the ISO standard.

Polling/Selection, Satellite and Local area Networks: Binary synchronous control, other BSC system, conversion using satellite communication SPUS, and the Tele-port primary attribute of a LAN, IEEE LAN standards, LAN topology and protocols.

Switching and routing in Network: Telephone switching system, message switching, packet switching, packet switching support to circuit switching networks.

The X.25 & Digital Networks: Layers of x.25, features of x.25 flow control principles, other packet type, x.25 logical channel states time out and time limits, packet formats, flow control and windows x.25 facilities, other standards layer the pad, communication networks communication between layers, advantage of digital networks, Digital's switching, voice transmission by packet.

Personal Computer Network: Personal computer communications, characteristics, using the personal computers as server linking the personal computer to mainframe computers, semaphores of vendor offerings. File transfer on personal computers, personal computer and local area networks. Personal computer networks and the OSI models.

TCP/IP: TCP/IP and internetworking, example of TCP/IP operations, related protocols ports and sockets. The IP address structure, major features of IP, IP datagram, Major IP services. IP source routing, value of the transport layer, TCP, Major features of TCP, passive and active operation, the transmission control block (TCB), route discovery protocols, examples of route discovery protocols, application layer protocols.

References:

1. Tannanhaum, A.S.   : Computer Network, PHI – 1995.

2. Martin J.: Computer Network and Distributed processing, 1985.

3. Black : Computer Network; Protocols, Standards and Interface PHI – 1995.

4. Black : Data Network; Concepts, Theory and Practices, PHI

5. Starlings, William   : Local Networks; and Introduction Mack Publishing Co.

6. Comer; Internetworking : Principles, Protocols Architecture, PHI with TCP/IP

7. Crichlow : Introduction to Distributed and Parallel Comp.

8. Ahuja : Design and Analysis of Computer Communication Network, McGraw Hill Co.

9. Chorafas: Designing and Implementing Networks, McGraw Hill Co.

SET/CSE/MIT/C303 : Analysis & Design of Algorithm

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 & the FFT, Number Theoretic Algorithms.

References:

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 & Data Structure: Boldwin Scragg, Wiley dreamtech

SET/CSE/MIT/DSE1A.1: Computer Graphics

Introduction to computer graphics & graphics systems

Overview of computer graphics, representing pictures, preparing, presenting & interacting with pictures for presentations; Visualization & image processing; RGB color model, direct coding, lookup table; storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc.; Active & Passive graphics devices; Computer graphics software.

Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm; Ellipse generating algorithm; scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

2D transformation & viewing Basic transformations: translation , rotation, scaling ; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines , parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation , clipping operations , point clipping , line clipping, clipping circles , polygons & ellipse.

3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel projection transformation; clipping, viewport clipping, 3D viewing.

Curves Curve representation, surfaces , designs , Bezier curves , B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves.

Hidden surfaces Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry.

Color & shading models Light & color model; interpolative shading model; Texture;

References:

1. Hearn, Baker – " Computer Graphics (C version 2nd Ed.)" – Pearson education
2. Z. Xiang, R. Plastock – " Schaum's outlines Computer Graphics (2nd Ed.)" – TMH
3. D. F. Rogers, J. A. Adams – " Mathematical Elements for Computer Graphics
4. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI
5. Sanhker, Multimedia –A Practical Approach, Jaico
6. Buford J. K. – "Multimedia Systems" – Pearson Education
7. Andleigh & Thakrar, Multimedia, PHI
8. Mukherjee Arup, Introduction to Computer Graphics, Vikas
9. Hill,Computer Graphics using open GL, Pearson Education

SET/CSE/MIT/DSE1A.2: Internet Technology

Introduction: Overview, Network of Networks, Intranet, Extranet and Internet.

World Wide Web :Domain and Sub domain, Address Resolution, DNS, Telnet, FTP, HTTP.

Review of TCP/IP : Features, Segment, Three-Way Handshaking, Flow Control, Error Control, Congestion control, IP Datagram, IPv4 and IPv6.

IP Subnetting and addressing : Classful and Classless Addressing, Subnetting. NAT, IP masquerading, IP tables.

Internet Routing Protocol : Routing -Intra and Inter Domain Routing, Unicast and Multicast Routing, Broadcast.

Client-Server programming In Java : Java Socket, Java RMI.

Threats : Malicious code-viruses, Trojan horses, worms; eavesdropping, spoofing, modification, denial of service attacks.

Network security techniques: Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH).

Firewall: Introduction, Packet filtering, Stateful, Application layer, Proxy.

Internet Telephony: Introduction, VoIP.

Multimedia Applications: Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV.

Search Engine and Web Crawler : Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.

References:

1. Web Technology: A Developer's Perspective, N.P. Gopalan and J. Akilandeswari, PHI Learning, Delhi, 2013.
2. Internetworking Technologies, An Engineering Perspective, Rahul Banerjee, PHI Learning, Delhi, 2011.

SET/CSE/MIT/DSE1A.3 Programming in JAVA

Java Programming: Introduction, Operator, Data types, Variables, Methods and Classes, Multi threaded programming, I/O Java applet.

Java Library: String handling, I/O exploring JAVA, Networking, Applet Classes, Event Handling, Introduction to AWT, Working with windows, Graphics, AWT Controls, Layout manager and menu, Images, Additional Packages.

Software Development Using Java: Java Bean, Java Swing, Java Servlets, Migrating from C++ to Java, Application of JAVA, Dynamic Billboard Applet.

Image Menu: An image based menu, Lavatron Applets, Scrabblets JDBC, Brief functioning of Upper Layer E-mail and their applications.

References:

1. Naughton, Schidt, "The Complete Reference JAVA2", TMH

2. Balagurusamy E, "Programming in JAVA, TMH

3. Dustin R. Calway, "Inside Serviets" Addison Wesley

4. Mark Wutica, "Java Enterprise Edition" QUE

5. Steven Hoizner, "Java2 Black book" Dreamtech

SET/CSE/MIT/DSE2A.1 Programming in Visual Basic

Introduction : What is Visual basic; Features of Visual Basic; Visual basic Editions; The Visual Basic Philosophy; The Controls; The Properties; Events; Methods; Developing an Application; Design the User Interface; Write Code to Respond to User Input/Events

Creating an Application : The Tool Box; Project Explorer; The Properties Window; The Form Window; Saving the Project; Understanding Projects; What does Visual Basic 6 have for you to create applications; Customizing this Toolbar; Text Box Control; The Picture Box; Label Box; Option Button; Frame; List Box; Combo Box; Data; Command Button; Check Box; The Drive, Directory and File List Controls; The Line and Shape Controls; The Image Control; OLE(Object Linking and Embedding); Other Tools for Software Development; Menu Bar; Context Menus; Tool Bars; Tool Box; Project Explorer Window; Properties Window; Object Browser; Form Designer; Code Editor Window; Form Layout Window; Immediate, Locals, and Watch Windows

IDE, Forms and Controls : The Form; The Anatomy of a Form; Setting Form Properties; Working with the Properties Window; Name; Caption; Picture; Background Color; The Control Box; Min Button and Max Button; Movable; Border Style; Font Properties; Form Methods; Move; Graphic Methods; Show Methods; Initialize; Load; Activate; Deactivate; Unload Event; Terminate; Show Method; Show Style; Hide Method; How Do You Put or Create the Control on the Form; Working with a Control; More work on a Control; The Code Window; Opening the Code Window; Anatomy of the Code Window; Now Entering the Code.

Variables: What is a Variable; Declaring variables; Data Types; The Null Value; The error Value; The Empty Value; The Scope of a Variable; Module Level Variable; Declaring Variable; Constants; Circular References; Converting Data Types; Arrays, How do you Define them; Declaring Fixed-Size Arrays; Multi-dimensional arrays; Dynamic arrays; The Preserve Keyword.

Writing Code in Visual Basic : The Code Window; Opening the Code Window; Parts of the Code Window; Object Box; Procedures/Events Box; Split Bar; Margin Indicator Bar; Procedure View Icon; Full Module View Icon; The Procedure Separator; The Anatomy of a Procedure; Subroutine or Function; Editor Features; Automatic Word Completion; Auto List Members; Color Cueing; Line Continuation Character; Commenting and Uncomment Statements; The For. Next Statement; The Decision Maker. If; The Loop; The While Loop; Select Case…End Select

Menus : Building the User Interface. The First Step; Overcrowding; Important Information Must be Given Prominence; Consistency; The Fonts; Consistency Across Forms and the Application; Affordances; Simplicity; Usability; Images; Colors; Interacting With the user; All about Menus; The Menu system; Menu Conventions; The Menu Editor; Using the Menu Editor; Making the Menu Better; Coding the Menu Items; Adding the Toolbar; Toolbar Conventions; Pasting Icons on Buttons

Multiple Document Interface Applications : Why MDI Forms; Features of an MDI Form; Loading MDI Forms and Child Forms; The Active Form Property; Changing the Caption of the New Forms; Listing Open Forms; Saving your work; Specifying the Active Child Form or Control; Maintaining State Information for a Child Form; Unloading MDI Forms with Query Unload

Additional Controls Available in Visual Basic 6.0 : Objectives; The Image List control; Working with the Image List Control; Adding Images to the Image List; Tab strip Control; Creating Tabs at Design Time or Run Time; Associating the Image List Control with the Tab Strip Control; MSFlexGrid Control; The Status Bar Control; The Panel Object and the Panels Collection; Tree View Control; Creating a Tree View control; Working with the Tree View control; Displaying Data from a Database; Populating the Tree View control; Slider Control;

ActiveX Data Objects : Objectives; Why ADO; OLE DB; ADO; Establishing a Reference; The Data Source; The ODBC Data Source Administrator; Using the Data Source name in Our Control; Table or Stored Procedure; Using Bound Controls; Updating the data in the Data Source; What is a Cursor

Crystal and Data Reports : Crystal Reports; Prerequisites for working with Crystal reports; Creating a Report through a Wizard; Creating a Report without a Wizard; The Design/Preview

SET/CSE/MIT/DSE2A.2   Advance RDBMS

Data Processing Systems. Transaction Processing and Concepts: Transaction system, Testing of seralizability, Seralizability of schedules, conflict and view seralizable schedule, recoverability, Recovery form transaction failures, deadlock handling .

File processing system. File Management system. Components of RDBMS. Database Architecture.
Object Oriented Databases. Distributed Databases. Client/server database. Data Dictionary. Database models. Normalization. The Database Administration. Database Manager responsibilities.
Monitoring Database performance. Database Machine overview.
Designing RDBMS for organization. Object modeling. Perspectives of Data Modelling.
Evolving the logical model. Transformation from Logical to Phical model.

Concurrency Control Techniques: Concurrency control, locking Techniques for concurrency control.
CODD's 12 rules for a fully relational DBMS.
Data Integrity. Redundancy. Primary and Foreign keys.

Object database management. Database design and choosing the database server.
SQL and MySql. Database access and ODBC.
Middleware: Kinds of middleware. Sockets-talking to database, virtual database engine defined, web based middleware, Microsoft JET engine,
Database security and Recovery. Data Mining and Warehouse.

References:

1.   Adv. DBMS by V.K. Jain, Cyber Tech Publication, 5A/13 Ansari Road, Daryagang, N.Delhi.-110002
2.   Date C.J. "An Introduction to Database System". Addision Wesley
3.   Korth, Silbertz, Sudarshan, "Database Concepts" McGraw Hill
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.

SET/CSE/MIT/DSE2A.3 Distributed and Parallel Computing

Parallel and high-performance computers, Models and parallel computers, Basic communication operations, Performance and scalability, MPT and open MP programming.

Distributed processing potential, Forms of Distributed processing strategies, Hexagon Distributed computing, client server model.

References:

1. Kumar, Grama, Gupta and Karypis : Introduction to Parallel Computing, Bejjamin Benjamin Cummings Publishing Co.
2. Tannanbaum, A.S. : Computer Networks, prentice-Hall.
3. Martin, J : Design and Strategy for Distributed Data Processing, Prentice Hall.
4. Martin, J. : Computer Networks and Distributed Processing, Prentice-Hall.
5. Stallings, William : Local Networks; An Introduction Macmillan publishing Co.

SET/CSE/MIT/DSE3A.1 C#

MS.NET Framework Introduction

The .NET Framework - an Overview , Framework Components , Framework Versions

Types of Applications which can be developed using MS.NET , MS.NET Base Class Library , MS.NET Namespaces , MSIL / Metadata and PE files.

The Common Language Runtime (CLR) ,Managed Code , MS.NET Memory Management / Garbage Collection , Common Type System (CTS) , Common Language Specification (CLS)

Language Basics

Datatypes & Variables Declaration , Implicit and Explicit Casting , Checked and Unchecked Blocks – Overflow Checks , Casting between other datatypes Features of Object Oriented programmingBoxing and Unboxing , Enum and Constant , Operators , Control Statements , Working with Arrays, Working with Methods , Pass by value and by reference and out parameters

Exception Handling

What is Exception , Rules for Handling Exception , Exception classes and its important properties, Understanding & using try, catch keywords , Throwing exceptions

Importance of finally block , "using" Statement , Writing Custom Exception Classes.

Working With Collections and Generics

Importance of IList and IDictionary., Using ArrayList and Hashtable. , Understanding IEnumerable and IEnumerator. Sorting Items in the collection using IComparable.

Typesafety issue with ArrayList and Hashtable classes. Writing custom generic classes.

Working with Generic Collection Classes.

WinForms

Introduction, Controls, Menus and Context Menus, MenuStrip, ToolbarStrip.

Graphics and GDI , SDI and MDI Applications , Dialogbox (Modal and Modeless)

Form Inheritance, Developing Custom, Composite and Extended Controls

Other Misc topics., Working with Resource Files , Working with Settings

Data Access using ADO.NET – DataSet

Dataset, Advantages of DataSet, DataSet Object Model, Fetching data using Fill methods of Data Adapter and filling data into Dataset to create a DataTable, Showing DataTable in DataGridView

SET/CSE/MIT/DSE3A.2 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.

SET/CSE/MIT/DSE3A.3 Multimedia Technology and Applications

Evolution of Multimedia and its objects, Scope of multimedia in business & 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 & Page Based Authoring Tools.

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

References:

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 & Design   Handbook" Dreamtech Press
9. John. Villamil-Casanova & Louis Molina, "Multimedia-Production, Planning & Delivery" PHI
10. Flash MX 2004 Bible: Robert , Wiley dreamtech India Pvt. Ltd.

SET/CSE/MIT/DSE4A.1   **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, min-max 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.

References:

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/MIT/ DSE4A.2 E-Governance

Introduction: E-Governance - Technology and Prospects, Definition of E-Governance, Economic potential of E-Governance, Incentives for engaging in E-Governance, forces behind E-Governance, Advantages and Disadvantages, Architectural framework, Impact of E-Governance.

Network Infrastructure of E-Governance: Internet based E-Governance 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.

References:

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 & Commerce: Brahm Cazner, Wiley dreamtech.

SET/CSE/MIT/ DSE4A.3 Fuzzy Logic & Neural Network

Statistical concepts and Reasoning theories. Probability and Bayes' Theorem. Certainity factors and Rule-Based systems. Bayesian networks.

Working of Human Mind. Discourse and Pragmatic processing. Semantic Nets and Frames. Fundamentals of Neural networks and Building techniques. Discovery and Analogy. Neural net learning and Genetic learning. Formal learning theory.

A.I. techniques, pattern recognition, Level of, speech recognition representation in A.I. properties of internal representation. Introduction to Predicate Calculus: Predicates and Arguments, connectives, Simplifications of strategies, extracting answers from Resolution Refutation. Control strategies.

Dempster-Shafer Theory. Parallelism in reasoning system. Distributed reasoning systems. Default reasoning, default logic. Logics for non monotonic reasoning. Symbolic techniques for representing and using uncertain knowledge. Definition, Concept, and framework of Fuzzy Logic. Fundamental changes to the idea about Set membership and corresponding changes to the definition of Logic Operations. Defining fuzzy sets, used in representing a list of Propositions.

Commonsense ontology. Memory organization. Case based reasoning. Perception. Robot Architectures. Graphical representation of networks. Matching. Forward and backward production system. Using deduction systems to generate Robot Plans. Heuristic graph search process .

Real Life Applications of Fuzzy Logic and Neural Networks.

References:
1. Principles of Artificial Intelligence. By Nils J. Nilsson, Narosa Publishing House, N.Delhi.
2. Artificial Intelligence Elaine Rich,Tata MC Graw, N.Delhi.
3. 3.Principal of Artificial Intelligence, Nelson, Springer-Verlag.
4. P. Hajek, Metamathematics of Fuzzy Logic, Kluwer Academic Publishers.
5. Harris, J., An Introduction to Fuzzy Logic Applications, Kluwer Academic Publishers, Dordrecht, 2000, ISBN 0-7923-6325-6.
6. Investment in Mutual Funds using Fuzzy Logic By Kurt E. Peray, Foreword by Chemical Publishing Co., Inc., New York.

SET/CSE/MIT/ DSE4A.4 Software Project Management

Introduction and Software Project Planning Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

Project Organization and Scheduling Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts. Project Monitoring and Control Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

Software Quality Assurance and Testing Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process. Project Management and Project Management Tools Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

References:

1. Software Project Management by M. Cotterell
2. Information Technology Project Management