

Bilaspur University, Bilaspur, Chhattisgarh
Syllabus of M.Sc. Computer Science (Yearly System) w.e.f. Session 2014-15

SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

For

MASTER OF SCIENCE

in

COMPUTER SCIENCE

(M.Sc.) DEGREE



BILASPUR UNIVERSITY

Bilaspur, Chhattisgarh

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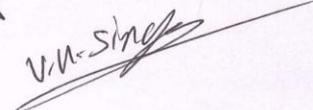
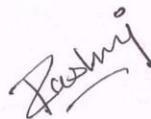
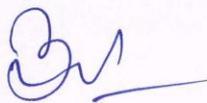
Structure & Syllabi for Two Year PG Degree Programme of Master of Computer Science (M.Sc. CS)

1. The title of the programme will be Master of Computer Science and will be introduced from the academic year 2014-15.
2. **Objectives:** The objectives of the Programme shall be to provide sound academic base from which an advanced career in Computer Science can be developed. Conceptual and scientific grounding in computer usage as well as its technological software application will be provided.
3. **Eligibility for admission :** In order to be eligible for admission to M.Sc. in Computer Science a candidate must have passed
 - a. Three years graduation degree with Maths or Computer Science or I.T. as passing Subject with minimum 40% marks in aggregate.
 - b. Three years BCA, conducted by recognized university or its equivalent.
4. **Duration:** The duration of the M.Sc. in Computer Science Degree Program shall be two years.
5. **The scheme of Examinations:** The M. Sc. Examination will be of 2800 marks as given Below:
 - I) Theoretical Papers: 1700 marks
 - II) Project and Practical Papers: 1100 marks
6. **The Standard of Passing and Award of Class**

In order to pass in the examination the candidate has to obtain 33% marks out of 100. (Min 33% marks must be obtained in theoretical papers as well as practical papers of University Examination).

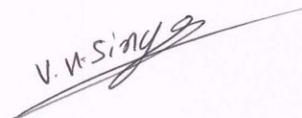
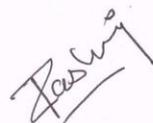
The class will be awarded on the basis of aggregate marks obtained by the candidate for all two years examinations.
7. **RULES OF Promotion**

As per section 14 of promotion rule.
8. The Medium of Instruction and Examination (Written and Viva) shall be English.
9. **Instructions to Paper Setters:**
 - a. In each theory paper, seven questions are to be set and paper has maximum 100 marks. Question paper should be in English.



- b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have 10 objective type questions. It should be of 20 marks.
- c. Question No. 2 should be compulsory and cover the entire syllabus. This question should have 05 short answer type questions. It should be of 20 marks.
- d. Apart from Question No. 1 and 2, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12 marks.

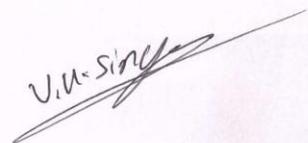
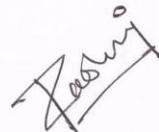
10. The Year wise Structure & plan of the programme shall be as follows :



Syllabus Scheme
(1st and 2nd Years)
For
Master of Science
in Computer Science
(M.Sc. CS)
Year Wise Plan

M.Sc. Previous Computer Science

| Subject Code | Subject Name | Subject Nature | End Year Examination Maximum Marks | End Year Examination Minimum Passing Marks |
|---------------------|--|-----------------------|---|---|
| MCST-101 | Digital Electronics and Microprocessor | Theory | 100 | 40 |
| MCST-102 | OOPs using JAVA | Theory | 100 | 40 |
| MCST-103 | Advanced Computer Network | Theory | 100 | 40 |
| MCST-104 | Data Structure | Theory | 100 | 40 |
| MCST-105 | Advanced Operating System | Theory | 100 | 40 |
| MCST-106 | Analysis and Design of Algorithm | Theory | 100 | 40 |



Bilaspur University, Bilaspur, Chhattisgarh
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| | | | | |
|--|--|-----------|-------------|----|
| MCST-107 | Advanced Database Management System | Theory | 100 | 40 |
| MCST-108 | Computer Graphics and Multimedia | Theory | 100 | 40 |
| MCST-109 | Advanced Computer Architecture | Theory | 100 | 40 |
| MCST-110 | .NET Technology | Theory | 100 | 40 |
| MCSP-111 | Java Programming with Data Structure Lab | Practical | 200 | 80 |
| MCSP-112 | .NET Programming Lab with SQL Server | Practical | 200 | 80 |
| Total Marks M.Sc. Previous (CS) Examination | | | 1400 | |

MCST-101

DIGITAL ELECTRONICS AND MICROPROCESSOR

UNIT-I

Evolution of Digital System & Logic Families

Semiconductor Materials, Types of Solids, Imperfections and Impurities in Solids, pn Junction Diodes, BJTs and other junction Devices, FET and MOSFET, Digital Electronic Signals and Switches, Diode and Transistor as a Switch, Logic Families – Significance and Types, Types of Logic Family: RTL, DTL, Transistor Transistor Logic (TTL), Emitter Coupled Logic (ECL), CMOS Logic Family, NMOS and PMOS Logic, CMOS Logic, Electrical characteristics of logic families, Comparison of Different Logic Families.

UNIT-II

Boolean concepts and Design of Combinational Circuits

Fundamentals of Logic Gates: AND Gate, OR Gate, Timing Analysis, Enable and Disable Functions, Inverter, NAND Gate, NOR Gate. Boolean Algebra and Simplification Techniques: Introduction to Boolean Algebra, Simplification Techniques: Sum-of-Products Boolean Expressions, Product-of-Sums Expressions, Karnaugh Maps for Multi-Output Functions, Quine-McCluskey method of minimization of logic functions, Karnaugh Map Method, Karnaugh Map for Boolean Expressions with a Larger Number of Variables, VEM Theory, MEV and 5 and 6 variable VEM Solution.

UNIT-III

Design of Combinational Circuits

Implementing Combinational Circuits using K-Map: Half-Adder, Full Adder, Half-Subtractor, Full Subtractor, BCD Adder, Design of code converters, comparators and various Circuits: BCD to excess-3 code and excess-3 to BCD converters, Binary to Gray Code and Gray Code to Binary Code converter, One & Two Bit Comparator, BCD to 7-segment decoder, BCD to 84-2-1 code converter and other code converter, Carry Propagation-Look-Ahead Carry Generator, Multipliers. Design of Multiplexers, Demultiplexers, Decoder and Encoder.

UNIT-IV

Design of Sequential Circuit

Introduction to sequential circuits: Moore and Mealy machines, Multivibrator, Bistable Multivibrator, Schmitt Trigger, Introduction to flip-flops like SR, JK, D & T with truth tables, logic diagrams, and timing relationships, Conversion of Flip-Flops, Excitation table, State tables, and realization of state tables, Design of shift registers, Counters: Ripple (Asynchronous) Counter, Synchronous Counter, UP/DOWN Counters, Design of Different Synchronous Counter using K-

V. N. S. M. S.

Map, Design of sequence generators and detectors, Introduction to Programmable Devices, Architecture of PLDs.

UNIT-V

Microprocessors System

Introduction to Microprocessors, Evolution of Microprocessors and family of microprocessor, Architecture of Microprocessor, Microprocessor Instructions, Addressing Modes and needs, Absolute or Memory Direct Addressing Mode, Immediate Addressing Mode, Register Direct Addressing Mode, Register Indirect Addressing Mode, Indexed Addressing Mode, Implicit Addressing Mode and Relative Addressing Mode, Microprocessor Selection Criteria, Eight-Bit Microprocessors: Intel 8085 Microprocessor, Motorola 6800 Microprocessor, Zilog Z80 Microprocessor, 16-Bit Microprocessors: 8086 Microprocessor, Pentium Series of Microprocessors, Salient Features of microprocessor, interrupts and pin functions.

Text Books:

1. Digital Electronics, William H. Gothmann, PHI
2. Introduction to Digital Systems, Palmer and Perlman, Tata Mc Graw-Hill
3. A Systematic Approach to Digital Design, Fletcher, Prentice Hall.
4. Digital Design, M. Mano, PHI
5. Microprocessors; Principal and Application, Gilmore, Tata Mc Graw-Hill
6. Circuit Design and Simulation with VHDL, V. Pedroni, MIT Press

Reference Book:

1. Digital Design, Samuel Lee, Pearson
2. The Intel Microprocessor- Architecture, Programming and Interfacing, Brey, PHI.
3. Introduction to Microprocessor for Engineers and Scientists, Hosh And Sridhar, PHI.
4. Microcomputer Systems: The 8086/8088 Family, Liu and Gibson, PHI.
5. Microprocessor-Theory and Applications, Rafiquzzaman, PHI.

MCST-102 OOPs USING JAVA

UNIT-I

An overview of Java

Life Cycle of a Java Program, JDK and JRE, Java SE and EE, Object-Oriented Programming: Classes and Objects, Variables, Constants, and Data Types, Declaring Variables, Constants, Primitive Data Types, Variable Scope, Wrappers, Autoboxing, and Unboxing, Program Comments, Conditional Statement if, switch Statement, Inheritance, Method Overriding, Class Methods: Method Arguments, Method Overloading, Constructors, Keyword super, this, final, static Passing by Value or by Reference, Variable Scopes, Packages, Interfaces, and Encapsulation, Abstract Classes, Polymorphism, Graphic User Interface, Event Handling in UI, Java Applets: Writing Applets Using Swing, Error Handling, Java Exceptions.

UNIT-II

Network-Socket Programming and JDBC

Introduction to Collections, & Introduction to Generics, Java Serialization, Network Programming, Socket Programming, Processing E-Mails with Java: Protocols and Servers, Creating Mailer, Required Supporting Classes, Writing the Mail Sender, Introduction to Multi-Threading, Digging Deeper into Concurrent Execution, Databases Using JDBC: JDBC Driver Types, Swing with JTable: JTable and the MVC Paradigm, Annotations and Reflection, Remote Method Invocation, Writing RMI Clients, Finding Remote Objects. Java EE 6 Overview: JCP,

JSR, and Other Acronyms, Tiers of Java EE Applications, Containers versus Application Servers.

UNIT-III

Programming with Servlets, JavaBeans and JNDI

Thin Client, How to Write a Servlet, How to Deploy a Servlet, Installing the GlassFish Plug-In for Eclipse, How to Create a Servlet with Eclipse, Browser-Servlet Data Flow, HTTP Get and Post Requests, Cookies, URL Rewriting, Server-Side HttpSession, Filters, Event Listeners, Asynchronous Servlets. JavaServer Pages: Embedding Java Code into HTML, Implicit JSP Objects, Overview of the JSP Tags, Directives, Declarations, Expressions, Scriptlets, JavaBeans, Using JavaBeans in JSP, JSTL. Developing Web Applications with JSF: Managed Beans, Creating a JSF Website. Introducing JMS and MOM: Messaging Concepts and Terminology, Two Modes of Message Delivery, JMS API Overview, Types of Messages, Administering Objects in Open MQ. Introducing JNDI: Java Naming and Directory Interface, Administering JNDI Objects in GlassFish, Accessing the GlassFish Naming Service with JNDI, Injection of JNDI Resources, DataSource and JNDI, Lightweight Directory Access Protocol.

UNIT-IV

Introduction to Enterprise JavaBeans and API

Who Needs EJB Containers? Types of EJBs, Stateless Session Beans, Stateful Session Beans, Singleton Beans, Deploying EJB, Message-Driven Beans, Timer Service. Introduction to the Java Persistence API: Mapping Objects to Database Tables, JPQL, EntityManager, A Brief Introduction to the Criteria API, Bean Validation. Working with RESTful Web Services.

UNIT-V

Introduction to Spring MVC Framework and JavaFX

Overview of Spring MVC: Processing HTML with Spring, Understanding the Spring Web MVC Workflow, Processing HTML Forms, Introduction to Hibernate Framework: Installing and Configuring Hibernate, Adding Hibernate Jars to an Eclipse Project, Testing the Database Connection, Configuring Hibernate with a DBMS, Retrieving Data with Hibernate. Bringing JavaFX to the Mix: Consuming Stock Quotes with JavaFX, Code Walkthrough, Reading JavaFX Code, HTML Client.

Text Books:

1. The Complete Reference – Java, Herbert Schildt, Tata McGraw Hill.
2. Introduction to Programming with JAVA – A Problem Solving Approach , John Dean, Raymond Dean, Tata Mc Graw Hill
3. Java Programming, Joyce Farrell, Cengage Learning.
4. Java Programming: A Practical Approach, C. Xavier, Tata McGraw Hill,
5. Introduction to Java programming: comprehensive version, Y. Daniel Liang, Pearson Education
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Reference Books:

1. Java Programming, Poornachandra Sarang, McGraw Hill Professional.
2. Gateway to Java Programmer Sun Certification, Keyur shah, Tata Mc Graw Hill
3. Java Fundamentals – A Comprehensive Introduction, Herbert Schildt, Dale Skrien, Tata Mc Graw Hill.
4. Java Programming : From the Ground Up, Ralph Bravaco, Shai Simonson, Tata McGraw Hill Edition.
5. Java Programming, D.S.Malik, Cengage Learning.
6. Core Java for Beginners, Rashmi Kanta Das, Vikas Publishing House Pvt. Ltd.

7. Using JAVA 2, Joseph L weber, PHI
8. JSP Java Server Pages, Barry Burd, IDG Books India(p) Ltd
9. Java2, swing, servlets, JDBC & JAVA Beans Programming Black Book Steven Holzner, Dreamtech press.

MCST-103 ADVANCED COMPUTER NETWORK

UNIT-I

Basics of Data Communication

Introduction to Computer Networks: Introduction, Network Hardware, Network Software, Reference Models, Data Communication Services & Network Examples, Internet Based Applications, Data Communications: Transmission Media, Wireless Transmission, Multiplexing, Switching. Communication System, Baseband and Carrier Communication, transmission modes, Baud rate, bit rate, SNR, Channel Bandwidth and rate of communication, Introduction to analog modulation techniques (AM, FM, PM, QAM) Digital Continuous Wave Modulation techniques: Modems, ASK, FSK, PSK, BPSK, QPSK, Multiplexing techniques: TDM, FDM, WDM, CDMA, Pulse amplitude modulation techniques, sampling theorem, PCM, PCM Encoder and Decoder, DPCM, ADPCM, Delta modulation, Line Coding techniques: Bipolar, Unipolar, RZ, NRZ, Manchester, AMI, B8ZS, Block coding techniques.

UNIT-II

Basics of Computer Networks and Physical layer

Need and Applications of Network, Protocols and Standards, OSI Model, TCP/IP Model, Network topology (Physical & logical), Transmission media: Guided transmission media - Twisted Pair, Coaxial and Fiber-optic cables, Wireless transmission: Electromagnetic spectrum, Radio and Micro Waves, Infrared, Lightwave, Spread Spectrum Systems, Digital hierarchy-Signaling system, DS lines, T lines, E lines, Cable modem Switching techniques: Circuit switching, Packet switching and message switching, Network Devices: Repeaters, Connectors, Transceivers and Media Converters, Bridges, Routers, Gateways, Multiprotocol Routers, Brouters, Hubs, Switches, Modems, Channel Service Unit CSU, Data Service Units DSU, NIC, Wireless Access Points, Transceivers, Firewalls, Proxies.

UNIT-III

Data Link Layer

Data link layer design issues: Services, Framing, Error and flow control, Stop-and-Wait protocol, Sliding Window protocol, HDLC, Channel allocation: Static and Dynamic allocation, Multiple Access Protocols: ALOHA, CSMA, Collision-free and limited-contention protocols, Virtual LANs, LANs & MANs: IEEE Standards for LANs & MANs-IEEE Standards 802.2, 802.3, 802.4, 802.5, 802.6, High Speed LANs, SONET, Video on Demand, Bluetooth, Cellular telephony, Broadband wireless technologies, LAN standards, Ethernet, Wireless LAN, Virtual LAN, DQDB, SMDS, Frame relay, Transmission in ISDN, Broad Band ISDN, ATM Networks, Data link layer in Internet.

UNIT-IV

Upper Layers

Design Issues in Networks: Routing Algorithms, Congestion Control Algorithms, Net work Layer in the Internet, IP Protocol, IP Address, Subnets, and Internetworking, Internet Transport Protocols: TRANSPORT Service, Elements of Transport Protocols, TCP and UDP Protocols, Quality of Service Model, Best Effort Model, Network Performance Issues, Over View of DNS, SNMP, Electronic Mail, FTP, TFTP, BOOTP, HTTP Protocols, World Wide Web, Firewalls.

UNIT-V

Advanced Concepts in Computer Networks

Over View of Cellular Networks, Adhoc Networks, Mobile Adhoc Networks, Wireless Medium Access Control, Properties of a MANET, Sensor Networks, Virtual Private Networks, Delay Tolerant Networks DTN, SDMA, FDMA, TDMA, CDMA, Mobile Network Layer: Mobile IP.

Text Books:

1. Computer Networks, Andrew S. Tanenbaum, PHI / Pearson Education Inc.,
2. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, Keith W. Ross, Pearson Education Inc., New Delhi.
3. Introduction to Data Communications and Networking, Wayne Tomasi, Pearson Education Inc., New Delhi.
4. Data Communications and Networking, Curt White, CENGAGE Learning India Pvt. Ltd., New Delhi.
5. Computer Networks, L. L. Peterson & B. S. Davie, Elsevier Inc,
6. Data Communication and Networking, Behrouz A. Forouzan, Tata McGraw-Hill.
7. Mobile Communication, Jochen Schiller, Pearson Education.
8. Handbook of Wireless Networks and Mobile Computing, Stojmenovic and Cacute, Wiley.

Reference Books:

1. Data and Computer Communication, William Stallings, Pearson Education.
2. Computer and Communication Networks, Nader F. Mir, Pearson Education, 2007.
3. Data & Computer Communication, Black, PHI.
4. Communication Networks, Walrand, TMH.
5. Internetworking with TCP/IP, Douglas E. Comer, Prentice Hall India.
6. Computer Networks: Principles, Technologies and Protocols, Natalia Olifer & Victor Olifer, Wiley India Pvt. Ltd., New Delhi.

MCST-104 DATA STRUCTURE

UNIT-I

Linear data structures

Basic concepts-Data types, Abstract Data Types, Data structures, Algorithms, Performance analysis- time complexity and space complexity, Asymptotic Analysis-Big O, Omega and Theta notations. Linear Lists, Sequential and Linked allocation, The list ADT, array and linked Implementations, Singly Linked Lists-Operations-Insertion, Deletion, Doubly Linked Lists-Operations- Insertion, Deletion, Stack ADT, definitions, operations, array and linked implementations, applications-infix to postfix conversion, recursion implementation, Queue ADT, definitions and operations, array and linked Implementations, Algorithm for above data structures using JAVA.

UNIT-II

Non Linear data structures

Trees, Basic Terminology, Binary tree ADT, Search trees- Binary search tree-Binary search tree ADT, insertion, deletion and searching operations, Balanced search trees, AVL trees-Definition and examples only, Red Black trees - Definition and examples only, B-Trees-definition, insertion and searching operations, Tree Map Classes, Tries(examples only), Comparison of Search trees. Threaded binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, Java code for traversals, Disjoint Sets, Union and Find algorithms, Priority Queues-Definition, ADT, Realizing a Priority Queue using Heap, Application of trees, Algorithm for above data structures using JAVA.

UNIT-III

Searching

Linear Search, Binary Search, Hashing-Introduction, hash tables, hash functions, collision resolution methods, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT-IV

Sorting

Bubble Sort, Insertion Sort, Selection Sort, Heap Sort, Radix Sort. Algorithm Design method-Divide and Conquer method-applications- Quick sort, Merge sort, Comparison of Sorting methods, Model for External Sorting, Algorithm for above data structures using JAVA.

UNIT-V

Graphs

Graphs: Introduction, Basic Terminology, Graph Representations- Adjacency matrix, Adjacency lists, Adjacency multilists, Graph traversals- DFS and BFS, Applications of Graphs-Minimum cost spanning tree using Kruskal's algorithm, Dijkstra's algorithm for Single Source Shortest Path Problem, 'set, linked and matrix' representation, operations on graphs, Applications of graphs.

Text Book:

1. Data Structures using C, A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
2. Data Structures using C by A. K. Sharma, Pearson Education
3. Data Structures and Algorithms, A.V. Aho, J.E. Hopcroft and T.D. Ullman, Addison-Wesley, Low Priced Edition.
4. Fundamentals of Data structures, Ellis Horowitz & Sartaj Sahni, AW Pub.
5. Fundamentals of computer algorithms, Horowitz Sahni and Rajasekaran, Pearson Edu.
6. Data Structures and Program Design in C, Robert Kruse, PHI.

Reference Books:

1. Theory & Problems of Data Structures, Jr. Seymour Lipschetz, Schaum's outline by TMH
2. Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
3. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H
4. Classical Data Structure, D. Samanta, PHI
5. Data Structures, schaum's Outlines,Adapted by G A PAI

MCST-105 ADVANCED OPERATING SYSTEM

UNIT-I

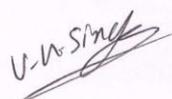
Operating System Basics

Processor Registers, Instruction Execution, Interrupts, Interrupts and the Instruction Cycle, Interrupt Processing, Multiple Interrupts, Multiprogramming, The Memory Hierarchy, Cache Memory, I/O Communication Techniques, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, Operating System Objectives and Functions, The Evolution of Operating Systems, Serial Processing, Simple Batch Systems, Multiprogrammed Batch Systems, Time-Sharing Systems, Microsoft Windows Overview, UNIX Systems, Linux Overview

UNIT-II

Processes and Process Control Strategy

Process States, Process Description, Process Control, Execution of the Operating System, Security Issues, Unix Process Management, Processes and Threads, Multithreading, Thread Functionality, Symmetric Multiprocessing, Microkernel Architecture, Windows Thread and SMP



Management, Solaris Thread and SMP Management, Linux Process and Thread Management, Principles of Concurrency, Mutual Exclusion: Hardware Support, Semaphores, Monitors, Message Passing, Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Integrated Deadlock Strategy, Dining Philosophers Problem, UNIX Concurrency Mechanisms, Linux Kernel Concurrency Mechanisms, Solaris Thread Synchronization Primitives, Windows Concurrency Mechanisms.

UNIT-III

Memory Management and Scheduling

Memory Partitioning, Paging, Segmentation, Security Issues. Virtual Memory, Locality and Virtual Memory, Operating System Software, UNIX and Solaris Memory Management, Linux Memory Management, Windows Memory Management, Types of Processor Scheduling, Scheduling Algorithms, Traditional UNIX Scheduling, Multiprocessor Scheduling, Real-Time Scheduling, Linux Scheduling, Unix SVR4 Scheduling, Windows Scheduling, Process and Thread Priorities, Multiprocessor Scheduling.

UNIT-IV

I/O Management and File Management

Disk Scheduling, I/O Devices, Organization of the I/O Function, Operating System Design Issues, I/O Buffering, Disk Scheduling, Case Study of UNIX SVR4 I/O, LINUX I/O, Windows I/O, File Organization and Access, File Directories, File Sharing, Record Blocking, Secondary Storage Management, File System Security, UNIX File Management, LINUX Virtual File System, Windows File System.

UNIT-V

Advance Topics of Operating System

Embedded Operating Systems, eCos, TinyOS, Computer Security Concepts, Threats, Attacks, and Assets, Intruders, Malicious Software Overview, Viruses, Worms, and Bots, Rootkits, Authentication, Access Control, Intrusion Detection, Malware Defense, Dealing With Buffer Overflow Attacks, Windows Vista Security, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.

Text Books:

1. Operating System Concepts, Silberschatz and Galvin, Pearson Education Pub.
2. Operating Systems, Madnick E., Donovan J., Tata McGraw Hill,
3. Operating Systems, A. S. Tannenbaum, PHI

Reference Books:

1. Operating Systems Internals and Design Principle, William Stallings, Prentice Hall Publishers
2. Operating Systems- A Concept-Based Approach, Dhananjay M. Dhamdhare, McGraw-Hill

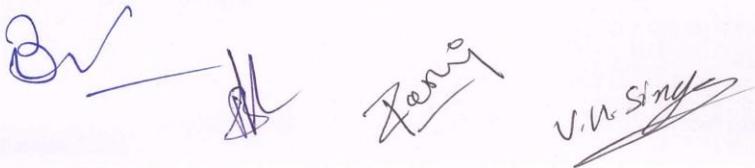
MCST-106

ANALYSIS AND DESIGN OF ALGORITHM

UNIT-I

Algorithm Design and Performance Analysis Techniques

Designing an Algorithm and Data Structures, Methods of Specifying an Algorithm, Proving an Algorithm's Correctness, Analyzing an Algorithm, Important Problem Types: Sorting, Searching, String Processing, Graph Problems, Combinatorial Problems, Geometric Problems, Numerical Problems, Fundamental Data Structures, Linear Data Structures, Graphs, Trees, Sets and Dictionaries, Measuring an Input's Size, Units for Measuring Running Time, Orders of Growth,



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Worst-Case, Best-Case, and Average-Case Efficiencies, Asymptotic Notations and Basic Efficiency Classes, Informal Introduction, Brute Force and Exhaustive Search, General Method for Binary Search, Finding the Maximum and Minimum, Topological Sorting, Fake-Coin Problem, Josephus Problem.

UNIT-II

Divide and Conquer and Problem Reduction

Divide and Conquer: General method, applications-Binary search, Quick sort, Merge sort, Binary Tree Traversals and Related Properties, Multiplication of Large Integers and Strassen's Matrix Multiplication, Closest-Pair and Convex-Hull Problems by Divide-and-Conquer, Computing a Matrix Inverse, Computing a Determinant, Balanced Search Trees, AVL Trees, 2-3 Trees, Heaps and Heapsort, Horner's Rule and Binary Exponentiation, Problem Reduction, Computing the Least Common Multiple, Counting Paths in a Graph, Reduction of Optimization Problems, Space and Time Trade-Offs, Sorting by Counting, Input Enhancement in String Matching, Horspool's Algorithm, Huffman Trees and Codes.

UNIT-III

Greedy and Dynamic Programming Methods

Greedy Method: General Method, Knapsack Problem, Tree Vertex Splitting Dynamic Programming, Applications-Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest path problem. Dynamic Programming: General method, Examples of Dynamic Programming Problem, Applications-Matrix chain multiplication, Optimal binary search trees, knapsack problem, Multistage Graphs, Single Source Shortest paths, All pairs shortest path problem, Traveling salesperson problem, Flow shop scheduling, Binary Trees, Graphs, Connected Components and Spanning Trees, Biconnected Components, Reliability design.

UNIT-IV

Backtracking and Branch and Bound

Backtracking, General Method, 8 Queens Problem, Graph Coloring, Branch and Bound Method, n-Queens Problem, Graph Coloring, Hamiltonian Circuit Problem, Subset-Sum Problem, Assignment Problem, 0/1 Knapsack Problem, Traveling Salesman Problem, Bisection Method, Method of False Position, Newton's Method, LC Branch and Bound solution, FIFO Branch and Bound solution.

UNIT-V

NP-Hard and NP-Complete problems

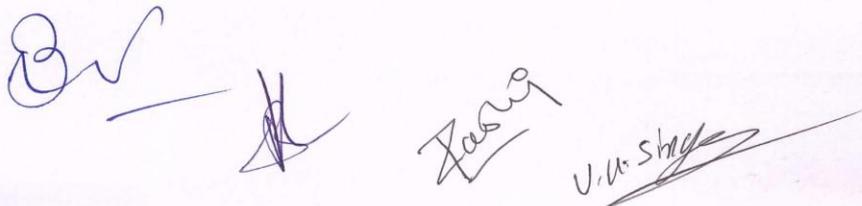
Basic concepts, non-deterministic algorithms, P, NP, and NP-Complete Problems, Cooke's Theorem, Clique Decision Problem, Job Shop Scheduling, String Matching, Randomized Algorithms, Approximation Algorithms for NP-Hard Problems, Approximation Algorithms for the Traveling Salesman Problem, Algorithms for Solving Nonlinear Equations.

Text Books :

1. Introduction to Algorithms, T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt.Ltd./ Pearson Education.
2. Computer Algorithms: Introduction to Design & Analysis, Basse, Addison Wesley.
3. Fundamental of Computer Algorithm, Horowitz & Sahani, Galgotia.
4. Introduction to the Design and Analysis of Algorithms, Anany Levitin, Pearson Education.

Reference Books:

1. A practical guide to data Structures and algorithms Using JAVA, Sally Goldman & Kenneth Goldman, CRC Press
2. Data Structures and Algorithms, V. Aho, J. E. Hopcroft, and J. D. Ullman, Pearson Education.
3. Fundamentals of Data structures in C++, E. Horowitz, S.Sahni and Dinesh Mehta, University Press.



MCST-107 ADVANCED DATABASE MANAGEMENT SYSTEM

UNIT-I

Fundamentals of Relational DBMS

Data Models, Schemas and Instances, Data Abstraction, Data Independence, Entity - Relationship (ER) Model, Relational data model concepts, Codd's 12 rules, Overview & Architecture of commercial RDBMSs: Oracle, SQL Server, My SQL etc., Database Language: SQL, SQL Programming Techniques: DDL, DML, DCL query statements, Constraints and Triggers, Views and Indexes, SQL in Server Environment.

UNIT-II

Database Design and Transaction Processing

Data dependency, Armstrong's Axioms, Functional dependencies and Normalization of Relational Databases, First, Second and Third Normal forms, Boyce-Codd Normal form (BCNF), ACID Properties of Transactions, Concurrency control, Serializability and Recoverability, Transaction support in SQL, Locking Techniques, Time Stamp ordering, Validation Techniques, Granularity of Data Items, Database recovery techniques - Shadow paging, Log Based Recovery, ARIES recovery algorithm, Database Security: Access control, Statistical Database Security, Deadlock: Detection, Avoidance and Recovery.

UNIT-III

Object Model and Object-Oriented Databases

User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Overview of Object-Oriented concepts, Database schema design for OODBMS; OQL, Persistent programming languages; OODBMS architecture and storage issues; Transactions and Concurrency control, Example of ODBMS, Database design for an ORDBMS - Nested relations and collections; Storage and access methods, Query processing and Optimization; An overview of SQL3, Implementation issues for extended type; Systems comparison of RDBMS, OODBMS, ORDBMS.

UNIT-IV

Parallel and Distributed Databases and Client-Server Architecture

Architectures for parallel databases, Parallel query evaluation; Parallelizing individual operations, Sorting, Joins; Distributed database concepts, Data fragmentation, Replication, and allocation techniques for distributed database design; Query processing in distributed databases; Concurrency control and Recovery in distributed databases. An overview of Client-Server architecture.

UNIT-V

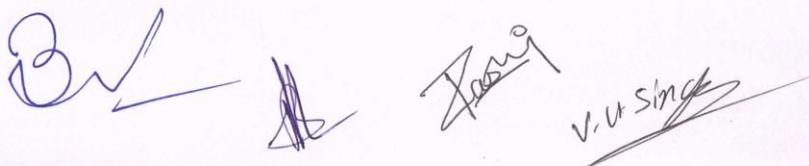
Databases on the Web and Advanced Applications

Web interfaces to the Web, Overview of XML; Structure of XML data, Document schema, Querying XML data; Storage of XML data, XML applications; The semi structured data model, Implementation issues, Indexes for text data, Active database concepts. Temporal database concepts.; Spatial databases, Concepts and architecture; Deductive databases and Query processing; Mobile databases, Geographic information systems.

Text Books:

1. Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, Pearson Education Inc., New Delhi.
2. Database Systems Concepts, Abraham Silberschatz, Henry F. Korth and S. Sudarshan, McGraw-Hill Education, New Delhi
3. Fundamentals of Database Management Systems, Mark L. Gillenson, Wiley India Pvt. Ltd., New delhi.
4. Introduction To Database Systems, C.J.Date, Longman, Pearson Education

Reference Books:



1. Database Systems: A Complete Book, Hector Garcia-Molina, Jeffret D. Ullman, Jenniffer Widom, Pearson Education Inc., New Delhi.
2. Database Systems: Design, Implementation, and Management, Peter Rob & Carlos Coronel, CENGAGE Learning India Pvt. Ltd., New Delhi.
3. Database Systems Using Oracle, Nilesch Shah, PHI Learning Pvt. Ltd., New Delhi.
4. Database Management Systems, Raghu Ramakrishnan, Johannes Gehrke, McGraw-Hill Education (India), New Delhi
5. Database Systems, Design, Implementation and Management, Peter Rob and Coronel, Thomson Learning.
6. Database Development and Management, Lee Chao, Auerbach Publications.

MCST-108 COMPUTER GRAPHICS AND MULTIMEDIA

UNIT-I

Introduction to Computer Graphics

What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham' s; Circle drawing algorithms: Using polar coordinates, Bresenham" s circle drawing, midpoint circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

UNIT-II

Two/Three Dimensional Viewing

2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck), Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

UNIT-III

Three-dimensional transformations and Hidden surface removal

Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation, Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems, Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area subdivision algorithm.

UNIT-IV

Representing Curves and Surfaces

Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method; Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

UNIT-V

Multimedia Technology

Framework for multimedia systems; multimedia devices; Multimedia Presentation and Authoring; professional development tools; Multimedia servers & databases; vector graphics; Animation techniques; Shading; Anti Aliasing; Morphing; Video on demand, Image Compression & Standards: Making still images; editing and capturing images; scanning images; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, Overview of other image file formats as GIF, TIFF, BMP, PNG etc., Introduction to MPEG, MP3, MP4 etc.

Text Books:

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addison Wesley.



2. Computer Graphics by Donald Hearn and M. Pauline Baker, 2nd Edition, 1999, PHI
3. Procedural Elements for Computer Graphics, D.F. Rogers, Tata McGraw Hill
4. An introduction, Villamil & Molina, Multimedia Mc Milan.
5. Multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:

1. Mathematical Elements for Computer Graphics, Rogers and Adam, Tata McGraw Hill.
2. Theory & Problem of Computer Graphics, Plastock, Schaum Series.
3. Computer Graphics, Tosijas, L.K., Springer-verleg
4. Principles of Interactive Computer Graphics, Newman, Tata McGraw Hill.
5. Graphics, GUI, Games & Multimedia Projects in C, Paliana & Mahendra, Standard Publ.
6. Computer Graphics Secrets and solutions, Corrign John, 1994, BPB.
7. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

MCST-109 ADVANCED COMPUTER ARCHITECTURE

UNIT-I

Fundamental Concepts of Computer Architecture

Role of compiler, Instruction set principles and examples, Classifying instruction set, Instruction Format, Memory addressing- type and size of operands, Addressing modes: Definition, Need, Type and Implementation of Addressing Mode, Execution of Instruction, Instruction Cycle, Type of Classification of Parallel Computing: Flynn's classifications, Handler's classifications and other classifications with example; Classification on basis of Software taxonomy: Kung's taxonomy & SPMD; Parallelism Approaches: Data Parallelism, Control Parallelism, Paradigms of parallel computing: Synchronous - vector/array, SIMD, Systolic; Asynchronous -MIMD, reduction paradigm; Interconnection Networks: Static and Dynamic Interconnection Networks, Multiprocessors-Bus Based- Switch Based Interconnection Networks, Analysis and Performance Metrics for Interconnection Networks, Scalability of Parallel Architectures.

UNIT-II

Computational Models and Pipelining

Computational Models: Combinational circuits, Sorting network, PRAM models, Performance of Parallel Processors & Performance Metrics: speedups, efficiency, utilization, communication overheads, single/multiple program performances, bench marks, Amdahl's law, Gustafson-Barsis's law, Karf-Flatt metric, Isoefficiency metric. Pipelining: Basic and Intermediate Concepts, Type of Pipeline, Pipeline Hazards, How Is Pipelining Implemented?, What Makes Pipelining Hard to Implement?, Instruction-Level Parallelism Concepts and Challenges, Static and Dynamic Scheduling, Numerical Problems on Dynamic Scheduling,

UNIT-III

Instruction level parallelism

Classification of ILP Processor: Pipeline Processor, Superscalar Processor and VLIW Processor, Comparisons and examples of all ILP Processor Architecture, Overcoming Data Hazards with Dynamic Scheduling, Dynamic Scheduling: Examples and the Algorithm, Reducing branch costs, High performance instruction delivery, Limitation of ILP; Hardware-Based Speculation, Advanced Techniques for Instruction Delivery and Speculation, Limitations on ILP for Realizable Processors, ILP software approach- compiler techniques- static branch protection- VLIW approach- H.W support for more ILP at compile time- H.W verses S.W solutions, Crosscutting Issues: Hardware versus Software Speculation, Thread-Level Parallelism.

UNIT-IV

Multiprocessors Architecture

Shared Memory Architecture, Classification of Shared Memory Systems, Bus-Based Symmetric Multiprocessors, Basic Cache Coherency Methods, Snooping Protocols, Directory Based Protocols, Symmetric Shared-Memory Architectures, Performance of Symmetric

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Syllabus of M.Sc. Computer Science (Yearly System) w.e.f. Session 2014-15

Shared-Memory Multiprocessors, Distributed Shared Memory and Directory-Based Coherence, Shared Memory Programming, Message Passing Architecture, Introduction to Message Passing, Routing in Message Passing Networks, Switching Mechanisms in Message Passing, Message Passing Programming Models, Processor Support for Message Passing, Message Passing Versus Shared Memory Architectures.

UNIT-V

Multicomputer Architecture & Parallel Programming

Client/Server Systems, Clusters and Grid Computing, PVM Environment and Application Structure, Message Passing Interface, Distributed Computing, Shared memory programming, distributed memory programming, object oriented programming, data parallel programming, functional and dataflow programming. Scheduling and Parallelization: Scheduling parallel programs, Loop scheduling, Parallelization of sequential programs. Parallel programming support environments.

Text Books:

1. Computer Architecture A quantitative approach, John L. Hennessy & David A. Patterson, Morgan Kaufmann.
2. Computer Architecture and parallel Processing, Kai Hwang and A. Briggs, McGraw-Hill.
3. Advanced Computer Architectures, Dezsó Sima, Terence Fountain, Peter Kacsuk, Pearson Education.
4. Fundamentals of Parallel Processing, Jordan H. F. and Alaghaband G., Pearson Education.
5. Parallel Computing: Theory and Practice, M.J. Quinn, TMH
6. Introduction to Parallel Computing, T. G. Lewis and H. El-Rewini., Prentice Hall.

Reference Books

1. Introduction to Parallel Processing, Shasikumar M., PHI
2. Practical Parallel Programming, Wilson G.V., PHI
3. Parallel Computer Architecture, D. E. Culler, J.P. Singh, A. Gupta, Morgan Kaufman.
4. Parallel Programming: A Machine-Independent Approach, T. G. Lewis., IEEE Computer Society Press, Los Alamitos.

MCST-110
.NET TECHNOLOGY

UNIT-I

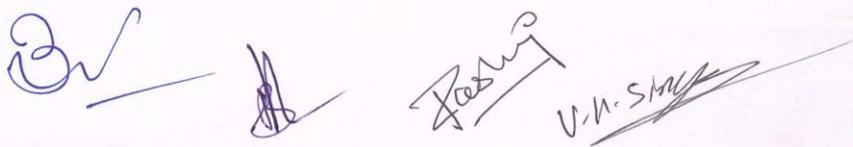
.Net Framework and C#.NET

Introduction to .NET Technology, .NET Framework, Components of .NET CLR and Class Library Importance of MSIL, CTS etc., Class Libraries, Introduction to Visual Studio.NET, IDE, Menu Bar, Toolbox, Output Windows, V&EDP, Inside a C# Program, Data Types, Statements, Arrays, Using Strings, Objects, Classes and Structs, Properties, Inheritance, Indexers, Delegates, Events, Namespaces, Generics, Collections and Data Structures, Exception Handling, Threading, Using Streams and Files, Reflection, Assemblies, versioning, Windows Forms, Controls.

UNIT-II

Programming with VB.NET

The structure of VB.NET and Control structures, VB.NET Variables, VB.NET Operators, Control Statements, Working with forms, GUI with windows forms, Working with Menu, Loops, Validation, Sub Procedures and Functions, Multiple Forms, Form Controls, File Handling, Exception Handling, Working with Databases, Advanced Database Programming using



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ADO.net, Classes, Generics, Collections, Inheritance, Custom Controls, Packaging & deployment, Using Crystal Reports.

UNIT-III

Fundamentals of ASP.NET

How to create simple ASP.NET, Building a Web Application, Examples Using Standard Controls, Using HTML Controls, Validating Form Input Controls using Validation Controls, Understanding Applications and State, Applying Styles, Themes, and Skins, Creating a Layout Using Master Pages, Working with Rich Controls – AD Rotator, Multi view, View, File upload etc, Working with navigation related controls - Treeview, SiteMapPath etc., Master pages and themes, Cookies and their application, Binding to Databases using Controls, Data Management with ADO.net , Creating a Site Navigation Hierarchy, Navigation Controls , Membership and Role Management, Login Controls, Securing Applications, Caching For Performance, Working with XML, Using Crystal Reports in Web Forms.

UNIT-IV

Database Handling with .NET Technology

How to consume a web service from an ASP.NET page, Web services accessing database, SQLConnect, SQLCommand, Data Access with LINQ to SQL : Automatic Properties, Initializers, Understanding type inference/lamda exp/generics/anonymous types, Creating LINQ to SQL Entities, Performing standard database commands with LINQ to SQL, Creating a custom LINQ entity Base Class, Standard Data-access operation, Performing Validation; Navigation Controls: Understanding Site Maps, SiteMapPath Control, Formatting the SiteMapPath Control, Menu Control, TreeView Control; Login Control: Automatically Redirecting a user to the Referring Page, Automatically Hiding the Login Control from Authenticated Users, Authenticated Users, ChangePassword Control, Templates with PasswordRecovery Control, Caching Application Pages and Data, Manipulating the Page Output Profiles, Localizing Applications for multiple languages, Setting the culture in the web.config file, Forms-Based Authentication with the web.cofig file.

UNIT-V

Advanced Applications in .NET Framework

XML Web Services: Setting WebMethod Attribute, Setting WebServices Attribute, Invoking an XML Web Service with HTTP-Get, HTTP-Post & SOAP, XML Web Services Behavior, AJAX(Asynchronous JavaScript and XML): Server Side & Client Side Ajax, Ajax Toolkit, Setting up and implementing Ajax, SQL Server Administration: Setup Database server of a website, Converting data between MDF to DBO, DBO to XLS or in any other format, Backup and Restore of data, FTP Management, Setting up FTP Server (Live), Sending Emails, Designing email panel, How to send an email to various users, Sending auto emails.

Text Books:

1. Professional Visual Studio 2013, Bruce Johnson, Wrox Publication
2. Beginning ASP.NET 4.5.1: in C# and VB, Imar Spaanjaars, Wrox Publication
3. Professional C# 5.0 and .NET 4.5.1, Christian Nagel, Jay Glynn, Morgan Skinner, Wrox Publication
4. Pro ASP.NET 3.5 in C# 2008, Matthew MacDonald and Mario Szpuszta, Wrox Publication
5. Pro ASP.NET MVC 3 Framework, Adam Freeman; Steven Sanderson, Apress
6. Professional ASP.NET MVC 3, Jon Galloway; Phil Haack; Brad Wilson; K. Scott Allen, Wrox
7. The Complete reference, ASP.NET, M M Donald, TMH

Reference Books:

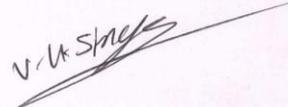
1. Pro ASP.NET 4 in C# 2010, Matthew MacDonald; Adam Freeman; Mario Szpuszta, Apress
2. Microsoft® ASP.NET 4 Step by Step, George Shepherd, Microsoft Press

3. Programming Microsoft® ASP.NET 4, Dino Esposito, Microsoft Press

MCSP-111
JAVA PROGRAMMING WITH DATA STRUCTURE LAB

List of Sample Problems/Experiments:

1. Write a JAVA program to perform the following operations :
 - a) Create a Singly linked list of integers.
 - b) Delete an integer from the above Singly linked list.
- 2(i). Write a JAVA program to implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists.
- 2(ii). Write a JAVA program to perform the following operations:
 - a) Create a doubly linked list of integers.
 - b) Delete an integer from the above doubly linked list.
- 2(iii). Write a JAVA program to implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
- 2(iv). Write a JAVA program to implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
- 2(v). Write a JAVA program to add two polynomials using linked list representation.
- 2(vi). Write a menu driven program to implement the following operations in an ordered linked list: a) Insertion b) Deletion c) Merging
3. Write JAVA programs to implement the following using an array.
 - a) Stack ADT b) Queue ADT
4. Write JAVA programs to implement the following using a singly linked list.
 - a) Stack ADT b) Queue ADT
- 5 (i). Write a JAVA program to convert a given infix expression into postfix form using stack.
- 5 (ii). Write a JAVA program to add two large integers using stack.
- 5 (iii). Write a JAVA program to evaluate postfix expression using stack.
- 5 (iv). Write a JAVA program to perform the following Stack operations using linked list .
 - a) Push b) Pop c) Clear
- 5 (v). Write a JAVA program to create and perform the following operations on Queues using linked list: a). Enqueue b). Dequeue
- 5 (vi). Write a JAVA Program to reverse elements of a Stack using an additional Stack.
- 6 (i) Write JAVA programs to implement the deque (double ended queue) ADT using a doubly linked list and an array.
- 6 (ii) Write JAVA program to perform the following Queue operations using Circular Array implementation (Use Templates): a) Enqueue b) Dequeue
- 6 (iii) Write a JAVA Program to reverse elements of a Stack using an additional Queue.
7. Write JAVA programs that use recursive functions to traverse the given binary tree in a) Preorder b) inorder and c) postorder
8. Write a JAVA program to implement the following operations in a Binary Search Tree:
 - a) Insert an element into a binary search tree.
 - b) Delete an element from a binary search tree.
 - c) Search for a key element in a binary search tree.
 - d) Deletion by copying or by merging.
 - e) Display the contents in one of preorder, postorder and inorder traversals using recursion.
 - f) Display the contents by level-by-level traversal.



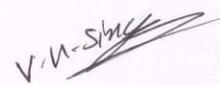
- g) Count the leaf and non-leaf nodes of the tree.
- h) Display the height of the tree.
- i) Create the mirror image of the tree.
- 9. Write JAVA programs that use non-recursive functions to traverse the given binary tree in
 - a) Preorder b) inorder and c) postorder.
- 10. Write JAVA programs for the implementation of BFS and DFS for a given graph.
- 11. Write JAVA programs for implementing the following Searching methods:
 - a) Linear Search b) Binary Search
- 12. Write JAVA programs for implementing the following sorting methods:
 - a) Bubble Sort b) Selection Sort c) Insertion Sort
- 13. Write JAVA programs for implementing the following sorting methods:
 - a) Merge sort b) Quick sort c) Heap sort
- 14. Write a JAVA program to perform the following operations
 - a) Insertion into a B-tree b) Deletion from a B-tree
- 15. Write a JAVA program to perform the following operations
 - a) Insertion into an AVL-tree b) Deletion from an AVL-tree
- 16. Write a JAVA program to implement all the functions of a dictionary (ADT) using hashing.
- 17. Write a JAVA program for implementing Knuth-Morris- Pratt pattern matching algorithm.
- 18. Write a JAVA program for generating Minimum cost spanning tree using Kruskal's algorithm.
- 19. Write a menu driven JAVA program to implement the following sparse matrices using one-dimensional array:
 - a) Diagonal Matrix
 - b) Lower Triangular Matrix
 - c) Upper Triangular Matrix
 - d) Symmetric Matrix
- 20. Write a JAVA program to create a Hash Table that allows insertion, deletion and searching for an element.

List of Sample Topic on Java:

- (1) Introduction
 - (1.1) Introduction – what is java, importance of java, java implementation application of java
 - (1.2) java buzzwords (simple, secure, portable, object-oriented, robust multithreaded, architecture – natural, interpreted, high performance, distributed dynamic)
 - (1.3) object oriented programming
 - (1.4) three OOP principals (encapsulation, inheritance, polymorphism)
 - (1.5) sample program & compilation
 - (1.6) using block of code
 - (1.7) lexical issues (White space, identifiers, literals, comments, separators, keyword)
 - (1.8) java class library

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- (2) Data type, operators, control structures
 - (2.1) variables, constants, declaration, literals, scope of variable, type casting
 - (2.2) arithmetic operators, relational operators, logical operators, assignment operators, increment –decrement operators, conditional operators, bit wise operators, interface of operators, dot operators
 - (2.3) if-else, statement, loops (while, do-while, for break, goto, continue return) switch statement, operator
 - (2.4) array –declaration, creation, initialization, length
 - (2.5) two-dimensional arrays
 - (2.6) string-string arrays, string methods, stringbuffer class
- (3) introduction of classes, objects and methods
 - (3.1) What is class, object & method
 - (3.2) defining class, adding variables, adding methods, creating objects
 - (3.3) constructors THIS key word, garbage collection, finalize() method
 - (3.4) accessing class members, methods overloading static members, nesting of methods
 - (3.5) vectors and wrapper classes
 - (3.6) inheritance, subclasses, subclass constructor, multiple inheritance, hierarchical inheritance overriding methods
 - (3.7) final variables and methods, final classes, finalizer methods, abstract methods and classes
 - (3.8) visibility control – public access, friendly access, protected access, private protected access, rules of thumb
 - (3.9) method overloading, object as parameters, argument passing, returning objects, recursion, access control, static, final
 - (3.10) Nested & inner classes
 - (3.11) String class
 - 3.12) Command-Line arguments
- (4) Inheritance
 - (4.1) Inheritance, Member access, super class
 - (4.2) creating multilevel Hierarchy
 - (4.3) Method over loading & overriding
 - (4.4) Abstract class, method
 - (4.5) Using final to prevent overriding & overloading
 - (4.6) The object class
- (5) Packages and Interfaces
- (6) exception handling
 - (6.1) exception types, uncaught exceptions, multiple catch clauses, nested try statements
 - (6.2) throw, throws, finally, java's built-in exceptions
 - (6.3) creating your own exception subclasses
- (7) Multithreaded programming

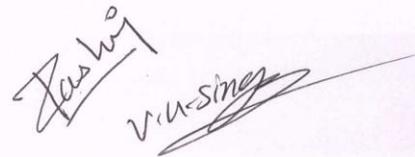


- (7.1) creating threads, run() method, new thread, thread class, stopping & blocking threads
- (7.2) life cycle of thread- newborn, runnable, running, blocked, dead, waiting sleeping, suspended, blocked
- (7.3) using thread methods, thread exceptions, thread priority, synchronization
- (7.4) implementing the Runnable interface
- (8) Applet
 - (8.1) what is an applet
 - (8.2) applet lifecycle
 - (8.3) applet class
 - (8.4) applet context class
 - (8.5) passing parameters to applet
 - (8.6) use of java .awt graphics class and its various methods in an applet
- (9) Event Handling
 - (9.1) Event delegation model or event class hierarchy
 - (9.2) all classes and interfaces of event delegation model, programmes related to event handling covering all types of events
- (10) I/O files in java
- (11) Graphical user interface
 - (11.1) Layout managers (FlowLayout, BorderLayout, CardLayout, GridBagLayout, GridLayout)
 - (11.2) AWT controls (labels, buttons, canvases, checkboxes, checkboxgroup, choices, textfields, textareas, lists, scrollbars, panels, windows, frames, menus, menubars)
- (12) Java Swing

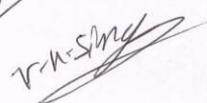
MCSP-112 .NET PROGRAMMING LAB with SQL

Series of Practical Curriculums

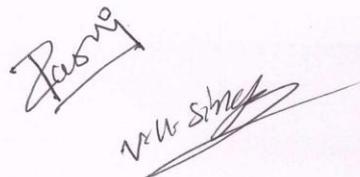
1. As per Unit-I to Unit-V of Theoretical Paper and
2. **Web Architecture**
 - The Way the Web works
 - The Asp.net difference
 - Client-Side Processing
 - How Asp.net Ties It Together
3. **Setting up and Installing ASP.NET**
 - Installing Internet Information Server
 - IIS Manager
 - Creating virtual/home directory
 - Folder Settings
 - Adding a virtual directory to your neighborhood
 - Installing .Net Framework SDK
4. **Overview of the ASP.NET Framework**



5. **Using the Standard Controls**
6. **Using the Validation Controls**
7. **Using the Rich Controls**
8. **Designing Websites with master pages**
9. **Designing websites with Themes**
10. **Microsoft SQL Server 2005 Express**
 - Overview of SQL Server 2005 Express
 - Installation of SQL Server 2005 Express
 - Features of SQL Server Express
 - SQL Server 2005 Express management tools
 - Server databases versus Local Databases
11. **Overview of Data Access**
 - Using DataBound Controls
 - Working with List Controls
 - Working with tabular DataBound Controls
 - Working with Hierarchical DataBound Controls
 - Working with other Controls, Using Data Source Controls
 - Using ASP.NET parameters with data source controls
 - Using programmatic DataBinding
 - Understanding Templates and Databinding Expressions.
 - Using templates, Using DataBinding Expressions
 - Using 2 way DataBinding Expression
12. **Using SQLDataSource Control**
 - Creating database connections
 - Connecting to MSSQL Server
 - Connecting to ORACLE and MS Access
 - Storing connection String in web configuration file
 - Executing Database Commands
 - Executing inline SQL Statements
 - Executing Stored Procedures
 - Filtering database rows
 - Changing the datasource mode
 - Handling SQL Command execution errors
 - Canceling command execution
 - Using ASP.NET parameters with SQL DataSource Control
 - Using the ASP.NET cookieparameter object
 - Using the QueryStringParameter object
 - Programmatically Executing SqlDataSource commands
 - Adding ado.net parameters
 - Executing Insert, Update and Delete commands
 - Executing select commands
 - Caching Database Data with SqlDataSource control
13. **Using List Controls**
 - Overview of the List Controls



- Declaring List Items
- Binding to a Data Source
- Determining the selected List Item
- Appending data items
- Enabling automatic post backs
- Using the Items Collection
- Working with the DropDownList control
- Working with the RadioButtonList control
- Working with the ListBox control
- Working with the CheckBoxList control
- Working with BulletedList control
- 14. Using the GridView Control**
- 15. Using the DetailsView and FormView Controls**
- 16. Using Repeater And DataList Controls**
- 17. Using The ListView and DataPager Controls**
- 18. Data Access with LINQ to SQL**
 - New C# and VB.NET Language features
 - Understanding Automatic Properties
 - Understanding Initializers
 - Understanding type inference/lamda exp/generics/anonymous types
 - Creating LINQ to SQL Entities
 - Performing standard database commands with LINQ to SQL
 - Creating a custom LINQ entity Base Class
 - Standard Data-access operation
 - Performing Validation
- 19. Using Navigation Controls**
- 20. Using the Login Control**
- 21. Caching Application Pages and Data**
- 22. Localizing Applications for multiple languages**
 - Setting the current culture
 - Setting a culture manually
 - Automatically detecting a culture
 - Setting the culture in the web.config file
 - Culture and ASP.NET controls
- 23. Using Forms-Based Authentication**
- 24. Creating an XML Web Services**
 - Precompiling an XML Web Service
 - Testing an XML Web Services from browser
 - Invoking an XML Web Service with HTTP-Get
 - Invoking an XML Web Service with HTTP-Post
 - Invoking an XML Web Services with SOAP
- 25. Advanced XML Web Services**
 - Using the WebService Behavior
 - Examining Limitations of the WebService Behavior
 - Creating a Simple Page with a WebService Behavior
 - Using WebService Behavior Callback Functions
- 26. AJAX(Asynchronous JavaScript and XML)**
 - About Ajax
 - Server Side Ajax & Client Side Ajax
 - Ajax Toolkit
 - Setting up and implementing Ajax



27. Microsoft SQL Server Administration

- Query analyzer
- Enterprise Manager Console
- Import/Export of data between Remote and Local Server(Live)
- How to setup Database server of a website
- Converting data between MDF to DBO, DBO to XLS or in any other format.
- How to generate SQL Script
- Backup and Restore of data
- Using Stored Procedure
- Uploading and downloading files from Database server

28. FTP Management

- Understanding FTP
- Setting up FTP Server (Live)
- Uploading and downloading FTP contents

29. Sending Emails

- Designing email panel
- How to send an email to various users
- Sending auto emails

SQL SERVER

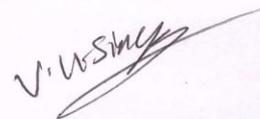
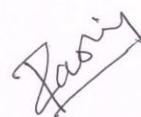
Following topics should cover on each part:

PART-1

Connecting to a Server, Using Management Studio with Database Engine, Data Types, Data Definition Language, Creating Database Objects, Creation of a Database, Modification of a Table's Contents, Security System of Database Engine, System Environment of Database Engine, System Databases, master Database, Business Intelligence and Transact-SQL, SQL/OLAP, Microsoft Reporting Services, Report Manager, Report Server, Report Catalog, SQL Server and XML, Introduction to Spatial Data.

PART-2

1. RDBMS Basics: What Makes Up a SQL Server Database?
2. Tools of the Trade
3. The Foundation Statements of T-SQL
4. JOINS
5. Creating and Altering Tables
6. Constraints
7. Adding More to Our Queries
8. Being Normal: Normalization and Other Basic Design Issues
9. SQL Server Storage and Index Structures
10. Views
11. Writing Scripts and Batches
12. Stored Procedures
13. User-Defined Functions
14. Transactions and Locks
15. Triggers
16. A Brief XML Primer
17. Reporting for Duty, Sir! A Look At Reporting Services
18. Getting Integrated with Integration Services
19. Playing Administrator



Bilaspur University, Bilaspur, Chhattisgarh
Syllabus of M.Sc. Computer Science (Yearly System) w.e.f. Session 2014-15

The break-up of marks for Practical will be as under :

| Sr. No. | Argument | Maximum Marks | Minimum Passing Marks |
|-------------|-----------------------------------|---------------|-----------------------|
| 1. | Lab Record | 50 | |
| 2. | Viva-voce | 50 | |
| 3. | Program Development and Execution | 100 | |
| Total Marks | | 200 | 40 |

***** M. Sc. Previous (CS) *****