



बिलासपुर विश्वविद्यालय, बिलासपुर (छत्तीसगढ़)

पाठ्यक्रम

एम.एससी. संगणक विज्ञान (पूर्व)

MCST-101

DIGITAL ELECTRONICS AND MICROPROCESSOR

UNIT-I

Evolution of Digital System & Logic Families

Semiconductor Materials, Types of Solids, Imperfections and Impurities in Solids, an 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, HMOS 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, QuineMcClausky 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-Map, Design of sequence generators and detectors, Introduction to Programmable Devices, Architecture of PLDs.



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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



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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 Multithreading, 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 Http Session, Filters, Event Listeners, Asynchronous Servlets. Java Server Pages: Embedding Java Code into HTML, Implicit JSP Objects, Overview of the JSP Tags, Directives, Declarations, Expressions, and Script lets, 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, Data Source and JNDI, Lightweight Directory Access Protocol.



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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, Entity Manager, 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.



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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: TOM, FDM, WDM, COMA, Pulse amplitude modulation techniques, sampling theorem, PCM, PCM Encoder and Decoder, DPCM, ADPCM, Delta modulation, Line Coding techniques: Bipolar, Unipolar, RZ, NRZ, Manchester, AML, 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, Light wave, 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



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UNIT-IV

Upper Layers

Design Issues in Networks: Routing Algorithms, Congestion Control Algorithms, Network 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, Electron Mail, F P, 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, SOMA, FDMA, TOMA, COMA, Mobile Network Layer: Mobile IP.



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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 mentalists, 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.



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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 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, Root kits, Authentication, Access Control, Intrusion Detection, Malware Defence, Dealing With Buffer Overflow Attacks, Windows Vista Security, Distributed Process Management, Process Migration, Distributed Global States, Distributed Mutual Exclusion, Distributed Deadlock.



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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, 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, Travelling salesperson problem, Flow shop scheduling, Binary Trees, Graphs, Connected Components and Spanning Trees, Disconnected Components, Reliability design.

UNIT-IV

Backtracking and Branch and Bound-

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



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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 Travelling Salesman Problem, Algorithms for Solving Nonlinear Equations.



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MCST-107

ADVANCED DATABASE MANAGEMENT SYSTEM

UNIT-I

Fundamentals of Relational DBMS

Data Models, Schemes and Instances, Data Abstraction, Data Independence, Entity Relationship (ER) Model, Relational data model concepts, Cod's 12 rules, Overview & Architecture of commercial RDBMSs: Oracle, SQL Server, My SQL etc., Database Language: SOL 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-Cord 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



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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: Scan line: 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 planar geometric projections, coordinate systems, Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scan line 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.



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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 Matrices: speedups, efficiency, utilization, communication overheads, single/multiple program performances, bench marks, Amdahl's law, GustafsonBarsis.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.



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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 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



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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 Struts, 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 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 activation related controls - Tree view, Sitemap Path 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.



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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 LINO to SQL : Automatic Properties, Initializes, Understanding type inference/lamda exp/generics/anonymous types, Creating LINO to SQL Entities, Performing standard database commands with LINO to SQL, Creating a custom LINO entity Base Class, Standard Data-access operation, Performing Validation; Navigation Controls: Understanding Site Maps, Sitemap Path Control, Formatting the Sitemap Path Control, Menu Control, Tree View Control; Login Control: Automatically Redirecting a user to the Referring Page, Automatically Hiding the Login Control from Authenticated Users, Authenticated Users, Change Password Control, Templates with Password Recovery 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 Web Method Attribute, Setting Web Services Attribute, Invoking an XML Web Service with HTTP-Get, HTTP-Post & SOAP, XML Web Services Behaviour, 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, Scanning up FTP Server (Live), Sending Emails, Designing email panel, How to send an email to various users, Sending auto emails



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.
 - (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.
 - (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
 - (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.
 - (v). Write a JAVA program to add two polynomials using linked list representation.
 - (vi). Write a menu driven program to implement the following operations in an ordered

linked list:

- a) Insertion
- b) Deletion
- c) Merging

Write JAVA programs to implement the following using an array.

a) Stack ADT b) Queue ADT write JAVA programs to implement the following using a singly linked list

a) Stack ADT b) Queue ADT

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- I. Write a JAVA program to convert a given infix expression into postfix form using stack
- II. Write a JAVA program to add two large integers using stack
- III. Write a JAVA program to evaluate postfix expression using stack
- IV. Write a JAVA program to perform the following Stack operations using linked list.
 - a) Push
 - b) Pop
 - c) Clear
- V. Write a JAVA program to create and perform the following operations on Queues using linked list: a). Enqueueb), Dequeue



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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

(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, string buffer 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, finalize 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



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- (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 .out 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) 110 files in Java
- (11) Graphical user interface
 - (11.1) Layout managers (flow layout, border layout, card layout gridbaglayout, grid layout)
 - (11.2) AWT controls (labels, buttons s canvases, checkboxes, checkbox group, choices, text fields, text areas, lists, scrollbars, panels, windows, frames, menus, menu bars)
- (12) Java Swing



MCSP-112

.NET PROGRAMMING LAB with SOL

Series of Practical Curriculumms

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. Scanning up and Installing ASP.NET

Installing Internet Information Server IIS Manager

Creating virtual/home directory Folder Settings

Adding a virtual directory to your neighbourhood Installing .Net Framework SDK

overview w of the ASP.NET Framework

us ng g the Standard Controls

6. Using the Validation Controls

using the Rich Controls

de inning g Websites with master pages

co inning g websites with Themes

IO.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 Data Bound Controls Working with List Controls

Working with tabular Data Bound Controls Working with Hierarchical Data Bound Controls

Working with other Controls, Using Data Source Controls Using ASP.NET

parameters with data source controls Using programmatic Data Binding

Understanding Templates and Data binding Expressions. Using templates, Using

Data Binding Expressions

Using 2 way Data Binding 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 data source mode

Handling SQL Command execution errors Cancelling command execution

Using ASP.NET parameters with SQL Data Source Control Using the ASP.NET cookie parameter 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



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Determining the selected List Item Appending data items
Enabling automatic post backs Using the Items Collection
Working with the Dropdown List control Working with the RadioButtonList control
Working with the List Box control Working with the Checkbox List control Working
with Bulleted List control
14. Using the Grid View Control
15. Using the Details View and Form View Controls
16. Using Repeater And Data List Controls
17. Using The List View and Data Pager Controls
18. Data Access with LINO to SQL
New C# and VB.NET Language features Understanding Automatic Properties
Understanding Initializes
Understanding type inference/lamda exp/generics/anonymous types Creating LINO
to SQL Entities
Performing standard database commands with LINO to SQL Creating a custom
LINO 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 Web Service Behaviour
Examining Limitations of the Web Service Behaviour Creating a Simple Page with a
Web Service Behaviour Using Web Service Behaviour Call-back 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 DB0,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)



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Uploading and downloading FTP contents

29. Sending Emails

Designing email panel

How to send an email to various users Sending auto emails

SQLSERVER

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 Catalogue, 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 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

,,...The break-up of marks for practical will be as under.:

Sr. No....., ,, .,, .. , Argument ,. - Maximum Marks Minimum

f l b b Record 50 Passing Marks

2. Viva-voce 50

3. Program Development and Execution 100

Total Marks ZOO 40

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