

Department of Computer Sci.

Computer Fundamental & MS-Word(paper code - 1.1)

B.Sc (C.S.) 1st Year (Sem. 1st)

Unit-I

Introduction : Historical evolution of computers, Classification of computers, Block Diagram along its components and characteristics, Usefulness of Computers. Human being Vs computer, Computer as a tool, Applications of computers.

Number Systems: Definition of Number system, necessity of binary number system, binary, decimal, octal and hexadecimal number system, interconversion of numbers, Representation of integers, fixed and floating points, BCD codes, Error detecting and correcting codes, character Representation-ASCII, EBCDIC, Binary arithmetic.

Unit-II

Input/Output Devices: Keyboards, mouse, joysticks, trackballs, digitizer, voice-recognition, optical-recognition, scanners, terminals, point-of-sale terminals, machine-vision systems. Hard-copy devices: Impact printers - DMPs, Daisy-wheel printers, Line-printers. Non-impact printers - Inkjet, Laser, Thermal, LED; Plotters. Soft-copy devices: Monitors, video-standards (VGA and SVGA).

Memory & Mass Storage Devices: Characteristics of memory systems, types of memory, RAM, ROM, magnetic disks - floppy disk, hard-disk; optical disks - CD, CD-I, CD-ROM; Magnetic tapes; Concepts of Virtual and Cache memory

Unit-III

Software Concepts: Introduction, types of software - System & Application software; Language translators - Compiler, Interpreter, Assembler; Operating system - Characteristics, bootstrapping, types of operating, operating system as a resource manager; BIOS; System utilities - Editor, Loader, Linker, File Manager. Concept of GUI, GUI standards. Introduction to Algorithm & Flowcharts, Advantages & Disadvantages.

Unit-IV

MS-OFFICE:MS-Word :- Creating a document, font operation, bullet and numbering, find & replace, hyper linking, mathematical operation, Create table and flow chart, Macro, Mail merge, Correcting grammar, protect files, difference between doc and docx.

MS-PowerPoint :- Creating single and multiple slide, Animation, manual and automatic slide show, hyper linking, DFD, shape and style.

MS-Excel:- Create sheet and rename sheet, table and operation, cells operation, hyper linking, Function (mathematic, logical), sort and data tools, protection(sheet, workbook).



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Bahal - 127 028 (Distt. Bhiwani) Haryana

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Computer Architecture (paper code - 1.2)

B.Sc (C.S.) 1st Year (Sem. 1st)

Unit-I

Basic building blocks and Circuit Design: OR, AND , NOT, XOR Gates; De Morgan's theorem, laws and theorem of Boolean algebra, Simplifying logic circuits—sum of product and product of sum form, algebraic simplification, Karnaugh simplification

Unit-II

Arithmetic Circuits: Adder, Subtractor, parallel Binary-adder/Subtractor, Binary Multiplier and Divider.

Combinational Circuits: Decoders and Encoder, Multiplexer and De-multiplexer circuits, Design of code Converters.

Unit-III

Sequential Circuits: Flip-flop-S-R, D, J-K, T, Clocked Flip-flop, Race Around condition, Master-Slave Flip-Flop, Realization of One Flip-Flop using other Flip-Flop, Shift-Registers, Counters-Ripple, Modular Synchronous, Ring & Twisted-Ring Counter.

Unit-IV

Register transfer and Micro-operations: Register transfer Language, Bus and Memory Transfer, Arithmetic, Logic Micro-operations, Shift Micro-operations.

Basic computer organization and Design: Instruction and instructions codes, computer instructions, timing and control, instruction cycle, memory references instructions, input- output reference instructions and interrupts;



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Programming In C (paper code - 2.1)

B.Sc (C.S.) 1st Year (Sem. 2nd)

Unit-I

Basic concepts of programming, techniques of problem solving, algorithm designing and flowcharting, concept of structured programming-Top-Down design, Development of efficient program; Program correctness; Debugging and testing of programs, Algorithm for searching, sorting(Insertion, Exchange), Merging of Order-List.

Unit-II

Overview of C: History of C, Importance of C, Structure of a C Program Elements of C: C character set, identifiers and keywords, Data types: declaration and definition. Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associativity, input/output statements, Arithmetic Expression, Evaluation of Arithmetic Expression, Type-casting and Conversion.

Unit-III

Decision making & branching: Decision making with if statement, if-else statement, nested if, else-if ladder, switch statement, goto statement. Decision making & looping: for, while, and do-while loop; Jumps in loop, break, continue. Functions: Definition, prototype, passing parameters, Recursion.

Unit-IV

Pointers: Declaration, operations on pointers, array of pointers, pointers to arrays. Data Structures: Arrays: One Dimensional, Multidimensional, Pointers and arrays. Strings: String Constants, Input & Output, String Functions. Structure & Unions. File Handling: Standard I/O text File, Writing to File, Reading a File.



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Structured Systems Analysis & Design (paper code - 2.2)

B.Sc (C.S.) 1st Year (Sem. 2nd)

Unit-I

Introduction to system, Definition and characteristics of a system, Elements of system, Types of system, System development life cycle, Role of system analyst, Analyst/user interface, System planning and initial investigation: Introduction, Bases for planning in system analysis, Sources of project requests, Initial investigation, Fact finding, Information gathering, information gathering tools.

Unit-II

Structured analysis, Tools of structured analysis: DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured English, Pros and cons of each tool, Feasibility study: Introduction, Objective, Types, Steps in feasibility analysis, Feasibility report, Oral presentation, Cost and benefit analysis: Identification of costs and benefits, classification of costs and benefits, Methods of determining costs and benefits, Interpret results of analysis and take final action.

Unit-III

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/Output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

Unit-IV

System testing: Introduction, Objectives of testing, Test plan, testing techniques/ Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.



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Data Communication & Networking (paper code - 3.1)

B.Sc (C.S.) 2nd Year (Sem. 3rd)

Unit-I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Architecture and the OSI Reference Model, TCP/IP reference model.

Unit-II

Analog and Digital Communications: Concept of data, signal, channel, bit-rate, maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Asynchronous and synchronous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts.

Unit-III

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to Ethernet, FDDI, Wireless LANs. Network Layer and Routing Concepts: Virtual Circuits and Datagram's; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Internetworking.

Unit-IV

Transport layer: Elements of Transport protocol: Addressing, Connection Establishment, Flow Control, Buffering, Crash recovery. Internet Transport protocol: UDP: Introduction, Real time Transport protocol, Remote Procedure Call. Application Layer: Domain Name System, Electronic Mail, World Wide Web.



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Object Oriented Design & C++ (paper code - 3.2)

B.Sc (C.S.) 2nd Year (Sem. 3rd)

Unit-I

Object oriented concepts: Class, Object, Methods, Message Passing, Abstraction, Inheritance, Polymorphism, Generosity, Overriding, Abstract Class & methods. Generalization, Aggregation, Associations. Object modeling techniques: Introduction to object model, Dynamic model, Functional Model. Strengths & Weakness of all models.

Unit-II

Introduction to Programming C++: Object-Oriented Features of C++, data types in C++, variables, operators, flow control, recursion, array, Pointers and their manipulation, strings, structures, Class and Objects, Data Hiding & Encapsulation, Data members and Member functions, Inline Functions, Static Data Members and Member Functions, Friend Functions, Preprocessor Directives, Namespace, Comparing C with C++.

Unit-III

Constructors & Destructors: Roles and types of Constructors, Constructor Overloading, Roles of Destructors, Dynamic Memory Allocation: Pointers and their Manipulation, new and delete Operators 'this' Pointer. Console I/O: Formatted and Unformatted I/O, Manipulators.

Unit-IV

Compile-Time Polymorphism: Unary and Binary Operators overloading through Member Functions and Friend Functions, Function Overloading, virtual functions, abstract class, virtual class Inheritance: Types of Derivations, Forms of Inheritance, Roles of Constructors and Destructors in Inheritance.



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Department of Computer Sci.

Data Structure with C/C++ (paper code - 4.1)

B.Sc (C.S.) 2nd Year (Sem. 4th)

Unit-I

Data-Structure: Data-Structure operations, Algorithm, Complexity, Data structure and its essence, Introduction to Arrays, Array operations, Multi- dimensional arrays, sequential allocation, address calculations, sparse arrays, Stacks-Introduction to Stacks, primitive operations on stacks, representation of stacks as an array and stack-applications.

Unit-II

Queues:-Introduction to queues, operations on queue, circular queue, priority queue, Applications of queue. Linked List-introduction and basic operations, Header nodes, doubly linked list, circular linked list, Applications of linked list, Representation of linked list as an array, stacks and queues.

Unit-III

Tree structures: Basic terminology, binary trees and binary search trees, implementing binary trees, Tree traversal algorithms, threaded trees, trees in search algorithms, AVL Trees, Polish notation and expression trees, applications of binary trees.

Unit-IV

Graph data structure and their applications. Graph traversals, shortest paths, spanning trees and related algorithms. Sorting: Internal and external sorting. Various sorting algorithms, Time and Space complexity of algorithms. Searching techniques. Applications of Sorting and Searching in computer science.



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Operating System (paper code - 4.2)

B.Sc (C.S.) 2nd Year (Sem. 4th)

Unit-I

Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, types of Operating System: Real time, Multiprogramming, Multiprocessing, Batch processing, Methodologies for implementation of O/S service system calls, system programs.

Unit-II

Process management: Process concepts, operations on processes, Process states and Process Control Block. CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multiple processor scheduling. Deadlocks: Deadlock characterization, Deadlock prevention and avoidance.

Unit-III

Concurrent Processes: Critical section problem, Semaphores, Classical process coordination problems and their solutions, Inter-process Communications. Storage Management : memory management of single-user and multi -user operating system, partitioning, swapping, paging and segmentation, Thrashing.

Unit-IV

File management: File Systems: Functions of the system, File access methods, allocation methods: Contiguous, allocation, linked, indexed allocation, Directory Systems: Structured Organizations, directory and file protection mechanisms.



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Database Management System (paper code - 5.1)

B.Sc (C.S.) 3rd Year (Sem. 5th)

Unit-I

Basic Concepts – Data, Information, Records and files. Traditional file – based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions, Advantages and Disadvantages of DBMS. Classification of Database Management System. Roles in the Database Environment - Data and Database Administrator.

Unit-II

Centralized and Client Server architecture to DBMS. Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances. Data Independence – Logical and Physical Data Independence. Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling. Hierarchical, network and relational model

Unit-III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes and keys, Relationship, relationship sets, Role name & recursive relationship and structural constraints, Conceptual design using E-R Diagrams. Relational Data Model:-Introduction, Properties of Relations, Keys, Integrity Constraints over Relations, Views. Relational Database Design: Functional Dependencies, Normalization: 1st to 3rd Normal Form, BCNF, Lossless Join and Dependency preserving decomposition.

Unit-IV

SQL: Types & components of SQL, Data Definition and data types, Data definition commands, Data manipulation commands, Data Control Commands Specifying Constraints(Primary Constraint,. Foreign key, Unique, Not Null) in SQL, Schema, Basic Queries in SQL, Insert, Delete and Update operations. Inbuilt Date, String functions. Commit, Rollback, Save points. **Views:** Introduction, Advantages of creating views, Features, Destroying/ Altering table & Views.



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Department of Computer Sci.

Introduction to Internet & Web Technology (paper code - 5.2)

B.Sc (C.S.) 3rd Year (Sem. 5th)

Unit-I

Introduction to Internet, Benefits of Internet, WWW, Hardware and software requirement for internet, internet protocols, applications of internet, Internet Tools- Telnet, FTP, Gopher, Archie, Veronica, Mosaic, WAIS, IRC, Online Chatting, Messaging, and Conferencing Concepts, resources of internet.

Unit-II

E-Mail mailing lists, Internet addressing, internet service provider (ISP), internet in India- Shell account, TCP/IP account, Home page and Web Site, internet accessing, internet terminology, internet security problems and solutions. Overview of Intranet and its applications, Web Browsers, Search Engines, Categories of Search Engines, Searching Criterion, Surfing the Net, Hypertext Transfer Protocol (HTTP), URL.

Unit-III

HTML: Internet Language, Understanding HTML, Create a Web Page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, E-mail Links and link within a Page, Creating HTML Forms.

Unit-IV

Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colors, Creating Animated Graphics., Web Page Design and layout, Advanced Layout with Tables, Using Style Sheets.



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Visual Basic Programming (paper code - 6.1)

B.Sc (C.S.) 3rd Year (Sem. 6th)

Unit-I

Introduction to VB: Visual & Non-visual programming, Procedural, Object-oriented and eventdriven programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Event drive programming.

Unit-II

Basics of Programming: Variables: Declaration, Types of variables, Converting variables types, User-defined data types, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement.

Unit-III

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array.

Unit-IV

Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types. Working with forms: Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, Activate & deactivate events, Form-load event, menu designing in VB, Database Programming using DAO & ADO, Simple Active X controls.



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Software Engineering (paper code - 6.2)

B.Sc (C.S.) 3rd Year (Sem. 6th)

Unit-I

Software and software engineering: Software characteristics, Software Processes, software crisis, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models, software engineering paradigms, goals and principles of software engineering.

Unit-II

Software requirement analysis – Structured analysis, object-oriented analysis and data modeling, software requirement specification, validation. Software requirements Analysis and Specifications: Requirement engineering, requirements analysis using DFD, Data Dictionaries and E-R Diagram, requirement documentation, nature of SRS, characteristics and organization of SRS.

Unit-III

Software project management: Planning a software project, Software cost estimation, project scheduling, personnel planning, team structure Software configuration management, software quality and quality assurance, project monitoring, risk management.

Unit-IV

Design and implementation of software- Software design fundamentals, software design principles, Cohesion and Coupling, Classification of Cohesion and Coupling, Function oriented design, objectoriented Design, design verification, monitoring and control..



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