

SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: First

SUBJECT: DISCRETE MATHEMATICS

SESSION: 2022-2023

PAPER CODE: 16MCS21C1

LECTURES	TOPIC
L 1-15	<p>UNIT I</p> <p>Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications. Relations and functions: Properties of Relations, Equivalence Relation, Partial Order Relation, Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.</p>
L 16- 30	<p>UNIT – II</p> <p>Propositional Logic: Proposition logic, basic logic, Logical Connectives, truth tables, tautologies, contradiction, Logical implication, Logical equivalence, Normal forms, Theory of Inference and deduction. Predicate Calculus: Predicates and quantifiers. Mathematical Induction.</p>
L 31- 45	<p>UNIT – III</p> <p>Matrices: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint and Inverse of a matrix. Determinants: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, Solving a system of linear equations.</p>
L 46- 60	<p>UNIT – IV</p> <p>Introduction to defining language, Kleene Closure, Arithmetic expressions, Chomsky Hierarchy, Regular expressions. Conversion of regular expression to Finite Automata, NFA, DFA, Conversion of NFA to DFA, FA with output: Moore machine, Mealy machine.</p>

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SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year SEMESTER: First

SUBJECT: COMPUTER FUNDAMENTALS AND PROGRAMMING IN C

SESSION: 2022-2023

PAPER CODE: 16MCS21C2

LECTURES	TOPIC
L 1-15	<p style="text-align: center;">UNIT II</p> <p>Problem Solving: Problem Identification, Analysis, Flowcharts, Decision Tables, Pseudo codes and algorithms, Program Coding, Program Testing and Execution. C Programming Fundamentals: Keywords, Variables and Constants, Structure of a C program. Operators & Expressions: Arithmetic, Unary, Logical, Bit-wise, Assignment & Conditional Operators, Library Functions, Control Statements: Looping using while, do...while, for statements, Nested loops; decision making using if...else, Else If Ladder; Switch, break, Continue and Goto statements.</p>
L 16- 30	<p style="text-align: center;">UNIT – III</p> <p>. Arrays & Functions: Declaration and Initialization; Multidimensional Arrays. String: Operations of Strings; Functions: Defining & Accessing User defined functions, Function Prototype, Passing Arguments, Passing array as argument, Recursion, Use of Library Functions; Macro vs. Functions. Pointers: Declarations, Operations on Pointers, Passing to a function, Pointers & Arrays, Array of Pointers, Array accessing through pointers, Pointer to functions, Function returning pointers, Dynamic Memory Allocations.</p>
L 31- 45	<p style="text-align: center;">UNIT-IV</p> <p>Structures and Union: Defining and Initializing Structure, Array within Structure, Array of Structure, Nesting of Structure, Pointer to Structure, Passing structure and its pointer to Functions; Unions: Introduction to Unions and its Utilities. Files Handling: Opening and closing file in C; Create, Read and Write data to a file; Modes of Files, Operations on file using C Library Functions; Working with Command Line Arguments. Program Debugging and types of errors.</p>
L 46- 60	<p style="text-align: center;">UNIT – I</p> <p>Computer Fundamentals: Concept of data and information; Components of Computer: Hardware Input Device, Output Device. CPU: Components of CPU; Memory and Storage Devices; Computer Software: System Software and Application Software; Functions of Operating System. Programming Languages: Machine, Assembly, High Level Language, 4GL; Language Translator; Linker,</p>

	Loader; Classification of Computers: Micro, Mini, Mainframe, Super computer. Advantages of Computer, Limitations of Computer, Range of Applications of Computer, Social concerns of Computer Technology: Positive and Negative Impacts, Computer Crimes, Viruses and their remedial solutions
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LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: First

SUBJECT: DBMS

SESSION: 2022-2023

PAPER CODE: 16MCS213

LECTURE S	TOPIC
L (1-15)	<p style="text-align: center;">UNIT-I</p> <p><i>Introduction: Database System vs File Processing System, Characteristics of database approach, Views of data, DBMS architecture and Data independence, Data Abstraction, Instance and Schemas, Data models; Database Languages: DDL, DML, DCL, Database Access for applications Programs, Database Users and Administrator, Transaction Management, Database system Structure, Storage Manager, Query Processor, History of Database.</i></p> <p><i>Database Design and E-R Modeling: Database Design: Conceptual, Logical and Physical Design; E-R Model: Entity types, Entity set, attribute and key, Relationships, Relation types, Roles and Structural constraints, Weak entities, Enhanced ER Mode</i></p>
L (16- 30)	<p style="text-align: center;">UNIT-II</p> <p><i>Relational Model: Introduction to the Relational Model, Integrity Constraint over Relations, Enforcing Integrity constraints, Querying relational data, Introduction to views, Destroying/altering Tables and Views.</i></p> <p><i>Relational Algebra and Calculus: Relational Algebra, Set operations, Selection and projection, renaming, Joins, Division, Examples of Algebra overviews, Relational calculus: Tuple relational Calculus, Domain relational calculus, Expressive Power of Algebra and Calculus.</i></p>
L (31- 45)	<p style="text-align: center;">UNIT – III</p> <p><i>Schema Refinement, Functional dependencies: Schema refinement in Data base Design, Problems Caused by redundancy, Decompositions, Problem related to decomposition, Lossless join Decomposition, Dependency preserving Decomposition, Normalization : FIRST, SECOND, THIRD Normal forms, BCNF, Fourth Normal Form, Fifth Normal Form .</i></p> <p><i>Transaction Management: ACID Properties, Transactions and Schedules, Concurrent Execution of transaction, Serializability and recoverability</i></p>

<p><i>L(46- 60)</i></p>	<p style="text-align: center;"><i>UNIT – IV</i></p> <p><i>Concurrency Control: Introduction to Lock Management, Lock Conversions, Dealing with Dead Locks, Concurrency without Locking, Recovery Techniques, Database Security.</i></p> <p><i>Introduction to Oracle : Getting started, Modules of Oracle, Invoking SQLPLUS, Data types, Data Constraints, Operators, Data manipulation - Create, Modify, Insert, Delete and Update; Searching, Matching and Oracle Functions.</i></p> <p><i>Introduction to PL/SQL: Advantages of PL/SQL, Generic PL/SQL Block, Execution Environment, Control Structure, Transactions, Security, database objects.</i></p>
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SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON-PLAN

Class: M.Sc CS IST YEAR

Semester: Odd

Subject: Computer Organisation and Architecture

PAPER CODE: 16MCS21C4

Session: 2022-23

Lecture Number	TOPIC
	UNIT 1: Representation of Information:
L 1-20	Number Systems: Binary
	Continued.....
	Octal and Hexadecimal
	Continued.....
	Practice Question done
	Integer and Floating-point representation
	Continued...
	Character codes: ASCII and EBCDIC.
	Basic Building Blocks and Circuit Design: Boolean Algebra
	Logic Gates: OR, AND, NOT, XOR Gates;
	Continue.
	De Morgan's theorem
	Universal building blocks;
	Simplifying logic circuits : sum of product
	product of sum form;

	Continue..
	Karnaugh Map simplification
	Doubt class
	Continue...
	Combinational logic blocks Adders
	Combinational logic blocks Multiplexers
	Continue.
	Encoder and decoder
	Continue.....
	Continue.....
	Sequential logic blocks :Latches
	Flip-Flops
	Continue.
	Registers and counters
	UNIT 2: Register transfer and Micro-operations
L 21-40	Register Transfer Language
	Presentation :Flip Flop
	Continue.....
	Bus and memory Transfer
	Micro operations: Arithmetic, Logic & Shift Micro operations.

	Basic Computer Organization and Design: Instructions Codes
	Register reference
	Continue.
	Memory Reference & Input-Output instructions
	Continue.
	Instruction Cycle
	Continue...
	CLASS TEST
	Timing and Control, Interrupts
	Design of Control unit: Hardwired control unit, Micro-programmed control unit.
	UNIT 3: Memory Organization:
L 40-60	Memory Hierarchy, Main Memory
	Auxiliary Memory
	Assignment: Instruction Cycle
	Cache Memory
	Virtual Memory.
	Continue...
	Register Organization and Parallel Processing: General Register Organization
	Stack organization and Instruction Format
	Addressing Modes; Data Transfer & Manipulation Instructions,
	CISC and RISC: Features and Comparison
	Pipeline and Vector Processing: Parallel processing, Pipelining, Arithmetic Pipeline, Instruction pipeline and Arrays Processors.

	Revision
	UNIT 4: Input-Output Organization
L 60-80	Peripheral Devices, Input-Output interface
	Asynchronous Data Transfer
	Modes of transfer
	Priority interrupt, Direct Memory Access (DMA)
	Input-output processors (IOP), Serial communication. Multi-processors
	characteristics of multi-processors, Interconnection structures, Inter-processor Arbitration
	Continued....
	Revision
	Test: Interrupt Structure and cycle
	Revision class

SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON-PLAN

Class: M.SC(Computer Science)1st Year Semester: EVEN

Subject: Data Structure

Session: 2022-23

Paper Code: 16MCS22C1

Lecture Number	Topic
1-16	Unit-1
	Introduction to Algorithm Design and Data Structure: Algorithm definition, Top-down and Bottom-up approaches to Algorithm design, Algorithm for searching, sorting, merging, Analysis of Algorithm: Frequency count, Time Space tradeoff, Structured approach to programming.
17-35	Unit-2
	Arrays: Representation of single and multidimensional arrays; Address calculation using column and row major ordering. Various operation on Arrays, Vectors, Application of arrays, Sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices. Sorting: Selection sort, Insertion sort, Bubble sort, Quick sort, Merge sort, Heap sort, Radix sort and their complexity. Searching: Linear search, Binary search, Hashing function and Collision Handling methods.
36-50	Unit-3
	Stacks and Queues: Introduction and Primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to Postfix; Introduction and Primitive Operation on queues, D-queues and Priority queues, Circular queue. Linked Lists: Introduction to Linked lists; Implementation of linked lists, operations such as traversal, Insertion, deletion, searching, Circular linked lists, Doubly Linked lists.
	Unit-4

51-75	<p>Trees: Introduction and Terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; threaded Binary trees, binary search trees; AVL trees, B tress.</p> <p>Graph: Adjacency matrix, Adjacency lists, Traversal schemes: Depth first and Breadth first search, 14 P a g e</p> <p>Spanning tree: Definition, Minimal spanning tree algorithms, Shortest path algorithms (Prim's and Kruskal's)</p>
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SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: Second

SUBJECT: OBJECT ORIENTED PROGRAMMING USING C++

SESSION: 2022-2023

PAPER CODE: 16MCS22C2

LECTURES	TOPIC
L 1-15	<p style="text-align: center;">UNIT I</p> <p>Procedural Language and Object Oriented approach. Characteristics of OOP: Objects, classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Passing. Structure of C++ program: Data-types, Variables, Static Variables, Operators in C++, Arrays, Strings, Structure, Functions, Recursion, Control Statements.</p>
L 16- 30	<p style="text-align: center;">UNIT – II</p> <p>Classes: Class, object, Memory Allocation for Objects, memory layout of objects, private, public, protected member functions, static members. Constructors: Features, types, dynamic constructor, Parameterized constructors; destructors. Memory management: Dynamic Memory allocation: new, delete, Object Creation at Run Time; This Pointer.</p>
L 31- 45	<p style="text-align: center;">UNIT – III</p> <p>Inheritance: Derived Class and Base Class, Different types of Inheritance, Overriding member function, Public and Private Inheritance, Ambiguity in Multiple inheritance, Virtual Inheritance, Abstract Class. Polymorphism: Definition, operator overloading, Overloading Unary and Binary Operators, Function overloading, Virtual function, Friend function, Static function.</p>
L 46- 60	<p style="text-align: center;">UNIT – IV</p> <p>Exception handling: Throwing, Catching, and Re-throwing an exception, specifying exceptions; processing unexpected exceptions; Exceptions when handling exceptions, resource capture and release. 10 P a g e Templates: Introduction; Class templates; Function templates; Overloading of template function, namespaces. Introduction to STL: Standard Template Library: benefits of STL; containers, adapters, iterators, vector, lists.</p>

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LESSON-PLAN

Class: M.SC(Computer Science)1st Year Semester: EVEN

Subject: Software Engineering

Session: 2022-23

Paper Code: 16MCS22C3

Lecture Number	Topic
1-16	Unit-1
	<p>Introduction to Software Engineering: Software crisis, Software engineering Approach and Challenges, Principles of software engineering, Software development process models with comparison: Waterfall, Prototype, Time boxing and Spiral Models, RAD Model and Automation through software environments. Quality Standards like ISO 9001, SEI-CMM.</p> <p>Software Project Management: Management activities, Project planning, Project scheduling, Risk management activities.</p>
17-35	Unit-2
	<p>Software Requirements Engineering: Requirements Engineering Processes, Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.</p> <p>Software Requirements Analysis & Specifications: Software requirements, Structured analysis: Data Flow diagram, data dictionary. Object oriented analysis, Software Requirement Specification (SRS): Need of SRS, Characteristics of SRS, Components of SRS, Structure of SRS.</p> <p>Software Metrics and Measure: Need and benefits of Software Metrics, Size Metrics: Line of code, Token metrics, Function point metrics, Control Complexity Metrics, Software Project Estimation Models- COCOMO models.</p>
36-50	Unit-3

	<p>Software Design: Fundamentals, problem partitioning & abstraction, design methodology, Function Oriented Design, Cohesion, Coupling & their classification, User Interface Design and Detailed design.</p> <p>Coding: Goals of coding phase, Programming style, Structured programming: objectives of structured programming, Principles of structured programming, advantages and disadvantages of structured programming.</p> <p>Software Testing: Impracticality of Testing all Data and Paths, Levels of testing, Functional vs. Structural testing, Static and Dynamic Testing Tools, Regression testing, Mutation Testing, Stress Testing; Validation Vs. verification.</p>
	Unit-4
51-75	<p>Software Maintenance: Need of maintenance, Categories of maintenance, Maintainability, Maintenance tasks, Maintenance side effects</p> <p>Software Re-Engineering: Source Code Translation, Program Restructuring, Data Re-Engineering, Reverse Engineering.</p> <p>Configuration Management: Maintaining Product Integrity, Change Management, Version Control, Configuration accounting: Reviews, Walkthrough, Inspection, and Configuration Audits.</p>

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SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: Second

SUBJECT: COMPUTER NETWORKS

SESSION: 2022-2023

PAPER CODE: 16MCS22C4

LECTURES	TOPIC
L 1-15	<p>UNIT I</p> <p>Types of Networks, Network Topologies, OSI and TCP/IP Reference Models; Comparison of Models. Data Communications Concepts: Digital Vs. Analog communication; Parallel and Serial Communication; Synchronous, Asynchronous and Isochronous Communication; Communication modes: simplex, half duplex, full duplex; Multiplexing; Transmission media: Wired-Twisted pair, Coaxial cable, Optical Fiber, Wireless transmission: Terrestrial, Microwave, Satellite, Infra-red.</p>
L 16- 30	<p>UNIT – II</p> <p>Communication Switching Techniques: Circuit Switching, Message Switching, Packet Switching. Data Link Layer Fundamentals: Framing, Basics of Error Detection, Forward Error Correction, Cyclic Redundancy Check codes for Error Detection , Flow Control. 12 P a g e Media Access Protocols: ALOHA, Carrier Sense Multiple Access (CSMA), CSMA with Collision Detection (CSMA/CD), Token Ring, Token Bus.</p>
L 31- 45	<p>UNIT – III</p> <p>High-Speed LAN: Standard Ethernet, Fast Ethernet, Gigabit Ethernet, 10G; Wireless LANs: IEEE 802.11, Bluetooth. Network Layer: IP Addressing and Routing, Network Layer Protocols: IPv4 (Header Format and Services), ARP, ICMP (Error Reporting and Query message); IPv6 (Header Format and Addressing).</p>
L 46- 60	<p>UNIT – IV</p> <p>Transport Layer: Process-to-Process Delivery: UDP, TCP; Connection Management by TCP; Basics of Congestion Control. Application Layer: Domain Name System (DNS); SMTP; HTTP; WWW. Network Security: Security Requirements and attacks; Cryptography: Symmetric Key (DES, AES), Public Key Cryptography (RSA); Firewall.</p>

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SARASWATI MAHILA MAHAVIDHYALAYA, PALWAL

LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: Second

SUBJECT: Mathematical Techniques and Applications

SESSION: 2022-2023

PAPER CODE: 16MATO1

LECTURES	TOPIC
L 1-15	<p>UNIT I</p> <p>Idea of Real Number System, Sets, Relations and functions. Solutions of linear and quadratic equations; Logarithms and Exponents. Trigonometric functions.</p>
L 16- 30	<p>UNIT – II</p> <p>Concepts of limit, Continuity and Differentiation. Slope of a straight line. Increasing and Decreasing functions, Maxima and Minima</p>
L 31- 45	<p>UNIT – III</p> <p>Integration - Simple techniques including integration by substitution and by parts for algebraic, exponential and logarithmic functions, Definite integrals.</p> <p>Differential Equation- Solution of first order linear differential equation.</p>
L 46- 60	<p>UNIT – IV</p> <p>Measures of Central Tendency and Dispersion. Linear Correlation and Regression.</p>

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LESSON PLAN

CLASS: M.Sc. (Computer Science) First Year

SEMESTER: Second

SUBJECT: Basics of E-Commerce

SESSION: 2022-2023

PAPER CODE: 16COMF2

LECTURES	TOPIC
L 1-15	UNIT I E-Commerce: Meaning, Concept, Definitions, Origin and Development, Categories of ECommerce: B2B, B2C, B2G, G2G,G2C; The Constitution of the E-Commerce: Portal of the Network, Customer Relationship Management, Supply Chain Management, Logistic Management, Decision Support; Supporting Environment for E-Commerce: Technical Environment, Legal Environment, Credit Environment and Financial Environment.
L 16- 20	UNIT – II M-Commerce: The Origin of M-Commerce, M-Commerce Components, The Development of MCommerce, The Application of M-Commerce
L 21-24	UNIT – III Payment Technologies for E-Commerce: Online Bank, E-Payment Tools: E-Payment System, Intelligent Card, E-check, E-wallet, E-Cash
L 25- 30	UNIT – IV Electronic Commerce: Influence on Marketing: Product, Physical Distribution, Price, Promotion, Marketing Communication, Common e-Marketing Tool

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