M.Sc (CS)

Lesson Plan

Even Sem

(2024-25)

Name of the Assistant Professor: Ms. Sandhya Chaudhary **Class And Section: M.Sc. 4th Semester** **Subject: Java Programming** **Teaching Term: 7th January to 5th May 2025 (Excluding Holi Break)**	
Week 1	Introduction: Java History, Java features Java and Internet, Java and World Wide Web, Java,Program Structure, Java Tokens, Java Virtual Machine, Data Types, Operators and Expressions,
Week 2	Decision Making and Branching, looping Classes and Methods. Inheritance: Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, types of Inheritance, AbstractClasses,Using Final Modifier
Week 3	Polymorphism: Types of polymorphism. Packages & Interfaces: Understanding Packages, **TEST 1**
Week 4	Defining a Package, Packaging up Your Classes, Adding Classes from a Package to Your Program, Understanding CLASSPATH, Access Protection in Packages,
Week 5	Concept of Interface. Exception Handling: Types of Exceptions, Dealing with Exceptions, Exception Objects.
Week 6	Multithreading Programming: Understanding Threads, The Main Thread, Creating a Thread,Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks Inter-thread Communication, **TEST 2**
Week 7	Input/Output in Java: I/O Basic, Byte and Character Structures, I/O Classes, Reading Console.Creating Applets in Java: Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet
Week 8	Display Methods, Requesting Repainting, Using The Status Window, The HTML APPLET TagPassing Parameters to Applets.
Week 9	AWT: Working with AWT Controls, AWT Classes, Window Fundamentals, Working with Frame,
Week 10	Creating a Frame Window in an Applet, Displaying Information Within a Window. **TEST 3**
Week 11	Working with Graph: Working with Graphics, Working with Color, Setting the Paint Mode,
Week 12	**MOCK TEST**
Week 13	Working with Fonts, Exploring Text and Graphics, Layout Managers and Menus.
Week 14	Thread,Creating Multiple Threads, Thread Priorities, Synchronization
Week 15	**REVISION**

Name of the Assistant Professor:Ms.NEETU **Class And Section:M.Sc(CS)-4thSem** **Subject: Software Testing(17MCS24DB2)** **Teaching Term: 7th January to 5th May 2025(Excluding Holi Break)**	
Week 1	Faults, Errors, and Failures, Basics of software testing, Testing objectives, Principles of testing, Requirements, behaviour and correctness, Testing and debugging,
Week 2	Test metrics and measurements, STLC, Verification, Validation, Types of testing: Functional and non – functional Testing; system testing, recovery testing,
Week 3	**Assignment:-** Security testing, stress testing, performance testing usability testing; Software Quality and Reliability, Software defect tracking
Week 4	Faults, Errors, and Failures, Basics of software testing, Testing objectives, Principles of testing
Week 5	**Test of unit-2:-**Requirements, behaviour and correctness, Testing and debugging, Test metrics and measurements, STLC, Verification, Validation,
Week 6	Functional and non – functional Testing; system testing, recovery testing, security testing
Week 7	**Assignment:**-Stress testing, performance testing, usability testing; Software Quality and Reliability,Software defect tracking,White box testing, static testing
Week 8	static analysis tools, Structural testing:Unit/Code functional testing, Code coverage testing, Code complexity testing, Black Box testing
Week 9	Requirements based testing, Boundary value analysis, Equivalence partitioning, state/graph based testing, Model based testing and model checking, Differences between white box and Black box testing.
Week 10	Top down and Bottom up integration, Bi-directional integration, System integration, Scenario Testing, Defect Bash, Design/Architecture verification,Deployment testing, Scalability testing, Reliability testing, Alpha, Beta and Acceptance Testing:Acceptance criteria; test cases selection and execution.
Week 11	**Test of Unit-3rd :-** Unit Testing in OO Context, Integration Testing in OO Context,OO testing methods, Class level testing, Interclass test case design, testing for real time system.
Week 12	**MOCK TEST**
Week 13	Regression testing, Regression test process, Initial Smoke or Sanity test, Selection of regression tests, Execution Trace, Dynamic Slicing, Test Minimization, Tools for regression testing, Ad hoc Testing: Pair testing, Exploratory testing, Iterativetesting, Defect seeding.
Week 14	Management, Execution and Reporting, Software Test Automation: Scope of automation, Design & Architecture for automation, Genericrequirements for test tool framework, Test tool selection.
Week 15	**REVISION**

Name of the Assistant Professor:Ms.Poonam **Class And Section:M.Sc(CS)-4th Sem** **Subject: Analysis and Design of Algorithm(17MCS24DA2)** **Teaching Term: 7th Janurary to 5th May(Excluding Holi Break)**	
Week 1	Sets and disjoint sets, union, sorting, merge sort, quick sort, selection sort .
Week 2	Divide and Conquer: General method, binary search-searching algorithms and their analysis in terms of space and time complexity.
Week 3	Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.**Test 1**
Week 4	Greedy Method: General method, Knapsack problem,Job sequencing with deadlines.
Week 5	Minimum spanning trees- Prim's and Kruskal's algorithms.
Week 6	Single source paths- Dijkastra algorithms and analysis of these problems.
Week 7	Dynamic Programming: General method, Optimal binary search trees, 0/1 Knapsack, Traveling Salesperson Problem.**Test 2**
Week 8	Back Tracking: General method, 8 Queen's Problem.
Week 9	Graph coloring, Hamiltonian cycles and analysis of these problems.
Week 10	Branch and Bound: Method, 0/1 Knapsack.
Week 11	Salesperson Problem, efficiency considerations.**Assignment 1**
Week 12	NP Hard and NP Complete Problems: Basic concepts, Cook's theorem.
Week 13	NP hard graph and NP scheduling problems some simplified NP hard problems.**Test 3**
Week 14	Advanced data structures: Red-Black trees, B-trees, Fibonacci Heaps.
Week 15	**REVISION**

Name of the Assistant Professor: Dr.NEHA JAIN

Class And Section: MSc. Previous

Subject: Object Oriented Programming using C++ (24CSC202DS03)

Teaching Term: 7th January to 5th May 2025(Excluding Holi Break)

Week 1	Object Oriented Programming Concepts: Procedural Language and Object-Oriented approach. Characteristics of OOP: Objects, classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Passing
Week 2	Structure of C++ program: Data-types, Variables, Static Variables, Operators in C++,
Week 3	Arrays, Strings, Structure, Functions, Recursion, Control Statements. CLASS TEST
Week 4	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.
Week 5	Memory management: Dynamic Memory allocation: new, delete, Object Creation at Run Time; This Pointer
Week 6	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.
Week 7	Polymorphism: Definition, operator overloading, Overloading Unary and Binary Operators, Function overloading, Virtual function, Friend function, Static function. CLASS TEST
Week 8	Exception handling: Throwing, Catching, Re-throwing an exception, specifying exceptions; processing unexpected exceptions; Exceptions when handling exceptions, resource capture and release.
Week 9	Templates: Introduction; Class templates; Function templates; Overloading of template function, namespaces.
Week 10	Introduction to Standard Template Library (STL): benefits of STL; containers, adapters, iterators, vector, lists. CLASS TEST
Week 11	Assignments, Revision
Week 12	**MOCK TEST**
Week 13	CASE STUDIES 1
Week 14	CASE STUDIES 2
Week 15	**REVISION**

Name of the Assistant Professor: Ms. Sandhya Chaudhary **Class And Section: M.Sc. 4th Semester** **Subject: Operating system** **Teaching Term: 7th January to 5th May 2025 (Excluding Holi Break)**	
Week 1	Introduction: Background of operating system, Operating system as Extended Machine and ResourceManager, History of Operating Systems(First, Second, Third and Fourth generation), Hardware review(Processors, Memory, I/O devices, Buses)..Evolution of Operating System: batch system, multiprogramming, time-sharing, real-time, mainframeoperating systems, multiprocessor operating systems, handheld, embedded, smartcard, distributed and personalcomputer operating systems.
Week 2	Operating system Concepts: Booting Computer, Address Spaces, Files, Client-Server Model, Security.Operating system Components: Process Managements, Memory Managements, I/O managements, Operating system services, System calls, System calls for Process, File and Directory management. **TEST 1**
Week 3	Operating system structures: Monolithic system, Layered system, Micro Kernels, Exo Kernels, VirtualMachines, Storage Structures, I/O structures, Files structures, and system Protections.
Week 4	Processes Management: Process model, Process creation, Process termination, Process states and transition,Thread model, Thread usage, Implementing thread in user space and Kernel.Synchronisation: Interprocess Communication, Race conditions, , Critical regions, Mutual exclusion with busy waiting, Disabling interrupts, Lock variables, Strict alternation, Peterson's solution, Sleep and wakeup,
Week 5	The producer consumer problem, semaphores, Mutexes, monitors, message passing, classical IPC problems: The dining philosopher problem.Scheduling: Process scheduling and Context Switch, Three level scheduling, Scheduling Algorithms: First Come First Serve, Shortest Job First, Priority, Round Robin, Shortest time Remaining First, Multiple queues. **TEST 2**
Week 6	Deadlocks: Introduction, Resources, Deadlock characterization, Deadlock modeling, Methods for handlingdeadlock, Ostrich algorithm, Deadlock prevention and avoidance, Safe and unsafe states, Banker's algorithm forsingle resource and multiple resources, Deadlock detection and recovery.
Week 7	Memory management: Address spaces, Monoprogramming without swapping, Multiprogramming with fixedScheme of Examinations and Syllabi Master of Science (Computer Science) Program partitions, Swapping, Memory management with bitmaps and linked list, Overlays, Memory allocations,
Week 8	First fit, Next fir, Best fit, Worst fit, Fragmentations, Virtual memory, Paging, Page tables, Paging hardware, TLB, Page replacements algorithms: Principle of optimality, First in First Out, LRU, LFU, NRU, Second Chance Page replacement, Clock, Working set page replacement, Belady's anamoly, Stack algorithm, Segmentation, and segmentation with paging. File systems: File naming, **TEST 3**
Week 9	File structure, File types, File access, File attributes, File operations, Access Methods, Directories and Levels, Directories Operations, Single level, two level and hierarchical directorysystem, File system mounting and sharing, Protection, Access control, File system layout, File system Implementation, Contiguous allocation, Linked list allocation, Linked list allocation using table in memory, Inodes, File system Examples.

Week 10	Input Output management: I/O devices, Devices Controller, Memory Mapped I/O, Direct Memory Access (DMA),Interrupts, I/O software Principles: programmed I/O, Interrupt driven I/O, DMA based I/O, I/O
Week 11	Software Layers, Interrupt handlers, Device drivers, Uniform interface for device drivers, Buffering, Allocating and Releasing dedicated devices. Disk management: Disk structure, RAID, Disk scheduling, First come first served, Shortest seek time first,
Week 12	**MOCK TEST**
Week 13	SCAN, C-SCAN, LOOK, C-LOOK, Error handling and formatting, Stable storage management.
Week 14	Unix/Linux Operating Systems: Overview of Unix/Linux in general and implementation of all above functions in these Operating System(s).
Week 15	**REVISION**

Name of the Assistant Professor:Ms.NEETU **Class And Section:M.Sc(CS)-2ndSem** **Subject: Software Engineering (24CSC202DS05)** **Teaching Term: 7th January to 5th May 2025(Excluding Holi Break)**	
Week 1	Software crisis, Software engineering Approach and Challenges, Software development process models with comparison: Waterfall, Prototype,
Week 2	Time boxing and Spiral Models,RAD Model and Automation through software environments. Quality Standards like ISO 9001, SEI-CMM.
Week 3	Requirement Analysis: Structured Analysis, Behavioral & non-behavioral requirements, Software requirementspecification: components & characteristics, Function point metric.
Week 4	Cost estimation, static, Single & multivariate models, COCOMO model, Putnam Resource Allocation Model, Risk management, project scheduling, personnel planning, team structure
Week 5	Software configuration management, quality assurance, project monitoring, Empirical.**TEST:**-Software Design: Fundamentals, problem partitioning & abstraction, design methodology, Function Oriented
Week 6	Design, Cohesion, Coupling & their classification, User Interface Design, Detailed design, Information flow metric.Choosing Programming Language, Characteristics of Program, Avoiding Dead Codes, and Program
Week 7	Metrics: Size Estimation; Complexity metric (McCabe's Cyclometic Complexity), Halsted Theory, Function Point Analysis.
Week 8	Software Testing: Impracticality of Testing all Data and Paths, Levels of testing, Functional vs. Structuraltesting, Static and Dynamic Testing Tools, Regression testing, Mutation Testing, Stress Testing; Validation Vs.verification.
Week 9	**Assignment:**-Choosing Programming Language, Characteristics of Program, Avoiding Dead Codes, and Program
Week 10	Metrics: Size Estimation; Complexity metric (McCabe's Cyclometic Complexity), Halsted Theory, Function Point Analysis.
Week 11	**Assignment:-** 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.
Week 12	**MOCK TEST**
Week 13	Source Code Translation, Program Restructuring, Data Re-Engineering, Reverse Engineering.**TEST:-** Software Configuration Management: Maintaining Product Integrity, Change Management, Version Control,
Week 14	Configuration accounting: Reviews, Walkthrough, Inspection, and Configuration Audits; Reliability Models(JM, GO, MUSA Markov), Limitations of Reliability Models.
Week 15	**REVISION**

Name of the Assistant Professor: Ms. Gurpreet Kaur **Class and Section: M.Sc-Ist Year** **Subject: Data Structure Using C** **Teaching Term: 7th January to 5th May 2025(Excluding Holi Break)**	
Week 1	Background and Concept of Data Structures: Data Structure, Concepts of Data Types, Abstract Data Type and their uses, Background for Data Structure, Definition and use of ADT, Array as an ADT, Structure, Pointer.
Week 2	Algorithms: Introduction to Algorithm and their properties, Concepts of Analysis of algorithm with asymptotic notations (Big Oh) and their properties, time and space complexities.
Week 3	Stack: Definition and Primitive Operations, Stack as an ADT, Stack Applications: Evaluation of Infix, Postfix and Prefix expressions, converting from infix to prefix and postfix.
Week 4	Queue: Definition, Queue as an ADT and Primitive Operations of Linear and Circular Queue, Application and advantages of Linear, Circular Queue, and Priority Queue (Ascending and Descending Priority Queue).
Week 5	Recursion: Definition and Principle of Recursion, Application of Recursion, Recursion removal using stack, example of recursion for TOH Factorial, Fibonacci Sequences, GCD, efficiency of above recursive algorithms.
Week 6	Linked List: List concepts, Definition and List as ADT, Static and Dynamic List Structure and implementation, Types of linked list, Operations on Linked List, Singly linked list.
Week 7	Circular Linked List, Doubly Linked List, Doubly Circular Linked List, Inserting, traversing and deleting nodes at beginning, end and specified positions in these linked lists, Linked implementation of a stack and queue in singly linked list.
Week 8	Tree: Definition and basic terminologies of tree, Binary Tree: Introduction, Types of Binary Tree, Level and depth, height balance tree(AVL), Operations in Binary Search Tree (BST): Insertion, Deletion.
Week 9	Tree Traversal: Pre-order traversal , In-order traversal (sorted list of Nodes), Post-order traversal, Applications of Binary Tree (Huff man tree, expression tree)
Week 10	Searching,. Sorting: Introduction and types of sorting Algorithm and implementation of Bubble Sort, Insertion Sort, Selection Sort, Quick Sort, Merge Sort Comparison and Efficiency of sorting algorithms.
Week 11	Searching: Introduction Sequential Search, Binary Search and Tree Search Comparison and Efficiency of Searching, Hashing: hash function, hash table and collision resolution techniques.
Week 12	**MOCK TEST**
Week 13	Graph: Definition, Representation of Graph, Types of Graph, Graph Traversal: Depth First Search, Breadth First Search Spanning Tree, Prim's Algorithm, Kruskal's algorithm and Round Robin Algorithm, Shortest Path Algorithm, Greedy and Dijkstra's Algorithm.
Week 14	Overview of File Structures: Concept of a file, types of files, File operations and database system. File Organization: Sequential file organisation – structures and processing, Record structures and access methods. Indexed sequential file organisation – structures and processing, Indexing techniques, B-trees and hashing for indexed files. Direct file organisation. Hashed File Organization - Hash function implementation.
Week 15	**REVISION**

Name of the Assistant Professor: Ms. Kamiya Chugh **Class And Section: M.Sc. 2nd Semester** **Subject: Artificial Intelligence** **Teaching Term: 7th January to 5th May 2025 (Excluding Holi Break)**	
Week 1	Definition and applications of Artificial Intelligence, Problem solving: Defining problem as State space search, Production systems, Problem characteristics, Search techniques: Brute force
Week 2	Heuristic search and their different searching techniques. **Assignment** – Uniform Cost Search and Knowledge representation: Types of knowledge
Week 3	**Test of Unit-1**, Inference rule, Knowledge Representation: Logic based Knowledge representation
Week 4	**Assignment**- Rule based knowledge representation, Non-Monotonic reasoning
Week 5	**Test of Unit-2**, Knowledge representation based on probability and uncertainty
Week 6	Knowledge representation schemes: Formal logic, Inference Engine, Semantic net, Frame, Assignment- Scripts.
Week 7	Expert System: Definition, Role of Knowledge in expert system, Architecture of Expert system.
Week 8	Expert system development life cycle: Problem selection, Prototype construction, Formalization, Implementation, Evaluation, Knowledge acquisition and different acquisition techniques,
Week 9	**Assignment**- Knowledge Engineering, Cognitive behavior. Perception: Sensing, Speech recognition, Vision, Action. Learning, Planning and Understanding
Week 10	Learning and its different types, Planning, understanding. **Test of Unit-3 till Perception**
Week 11	Neural Networks: Introduction, Comparison of artificial neural networks with biological neural networks, Learning in neural networks, Perceptions, Back propagation networks, application of neural networks.
Week 12	**MOCK TEST**
Week 13	Fuzzy logic: Definition, Difference between Boolean and Fuzzy logic, fuzzy subset, **Assignment- fuzzy membership function**
Week 14	Fuzzy expert system, Inference process for fuzzy expert system, fuzzy controller.
Week 15	**REVISION**

K.L MEHTA DAYANAND COLLEGE FOR WOMEN,FARIDABAD
LESSON PLAN FOR THE SESSION 2024-25(EVEN SEMESTER)

Name of the Assistant Professor:Ms. KRITIKA VAID **Class And Section:M.Sc(CS)-2nd Semester** **Subject: Multimedia and Animation(24CSC202SE01)** **Teaching Term: 7th Janurary to 5th May(Excluding Holi Break)**	
Week 1	Introduction to Multimedia: What is multimedia, Multimedia and Hypermedia, Components of multimedia- textual, images, graphics, animation, audio and video.
Week 2	Linear and Non-Linear Multimedia, Application of Multimedia, Requirement of Multimedia System.
Week 3	Fonts and Hypertext: Usage of text in Multimedia, Families and faces of fonts, outline fonts, bitmap fonts. **TEST 1**
Week 4	International character sets and hypertext, Digital font's techniques.
Week 5	Image fundamentals: Image formats, Bitmap and Vector, Color Models, Color palettes, 2D Graphics, Image Compression and File Formats: GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF.
Week 6	Basic Image Processing, Use of image editing software, Photo Retouching, Image resolution, Colour, Raster and Vector Graphics. **ASSIGNMENT 1**
Week 7	Audio Fundamentals: Audio quality, formats and devices, Digitization of sound, Sound synthesis, Musical Instrument Digital Interface (MIDI).
Week 8	Compression and transmission of audio on internet, Audio Software, Editing sound.
Week 9	Video Fundamental: Video basics, Formats, how video works, Types of video signals – component, composite and S-video. **TEST 2**
Week 10	Video software, Video Recording, Shooting and editing Video, File formats (JPEG, MPEG).
Week 11	Animation: Introduction and definition of animation, Principles, Types and uses, Methods and Techniques of animation, Basic animation, Text and image animation, Time line construction and management, Masking Motion.
Week 12	**Mock Test**
Week 13	Animation Software: Shape tweening, morphing, Onion skinning, Animation File Formats, Keyframe animation.
Week 14	Developing simple: 2D animations, Tweening and motion along a path, creating a motion based movie, adding sound in an animation
Week 15	**REVISION**