

S.No.	Sub Topic	Topic	Week No
1	What is a Computer ?	Fundaments of Programming in Java	Week 1
	Components of Computer(Primary Memory, Processor, Secondary Memory)		
	Introduction to Programming		
	Introduction to Java		
	Platform and Platform Dependency(Non- Potability)		
	How Java Made Portable(Platform Independent - WORA)		
	Introduction to Object Orientation (Basics)		
	Main method in Java		
	Statically typed vs Dynamically typed Programming Language		
	Variables in Java Detailed		
	Data Types in Java Detailed		
	Type Casting and Truncation		
	Identifiers and Naming Convention		
	Module1 exam - 25 MCQs		
2	Operators in Java Introduction	Operators, loops and Logic building with pattern programming	Week 2
	Incrementation and Decrementation		
	Assignment Operator		
	Relational Operator		
	Logical Operators		
	Conditional statement - (if - else)		
	Ternary Operator		
	Switch case		
	Loops introduction and for loop in java		
	while loop		
	do-while loop		
	Nested for-loop		
	System.out.print() vs println()		
	Scanner class in Java (console user input)		
	Pattern Programming(Loops, conditional and operator)		
	Complex Pattern Programming		
31	Module2 exam - 25 MCQs		
3	Classes and Object Creation	Java Objects and Methods	Week 3
	JVM data areas		
	Intstance variable vs local variables		
	Methods with memory maps (JVM data areas)		
	Method overloading		
	Main method overloading		

	Var-args		
	Wrapper classes		
	Method overloading with type promotion		
	Module3 exam - 25 MCQs		
4	Why an array?	Array in Java	Week 4
	Creating An Array		
	Different ways to create an array		
	2D Regular Array		
	2D Jagged Array		
	length vs length()		
	Enhanced For Loop		
	ArrayIndexOutOfBoundsException		
	Disadvantages of Array in Java		
	Module4 exam - 25 MCQs		
5	String Introduction	Strings in Java	Week 5
	Types of String		
	Immutable String and Memory Map		
	Ways to compare		
	String Concatination		
	Inbuilt methods in String class		
	Introduction to Mutable String		
	final vs Immutability		
	More on Mutable String		
	StringBuffer vs StringBuilder		
	Module5 exam - 25 MCQs		
6	Need of Encapsulation	Encapsulation, Constructor and static keyword in Java	Week 6
	What is Encapsulation?		
	Private members		
	Shadowing problem and this keyword		
	Setters ,Getters		
	Constructor in Java		
	More on Constructor		
	Constructor Overloading		
	this() vs super() method call		
	Static keyword Introduction		
	Class loading and How java program actually executes(JVM)		
	static and non static member of class		
	Static variables, static methods, static block		
	static variables vs instance variables		
	static method vs non-static method		
	static block vs Java instialization block		

		Module6 exam - 25 MCQs	
7	Inheritance Introduction	Inheritance, Polymorphism and Abstraction	Week 7
	More on Inheritance		
	Types of Inheritance		
	Types of methods (Inherited, Overriding, Specialized)		
	Package and Access modifiers in Java		
	Rules to override method in Child class		
	Constructor execution in case of Inheritance		
	Introduction to Polymorphism		
	More on Polymorphism		
	Abstraction and abstract keyword		
	final keyword in Java(final class, final variable, final method)		
	Module7 exam - 25 MCQs		
8	Why Collection ?	Collection and Map API in Java	Week 8
	Collection Heirarchy		
	ArrayList		
	ArrayDeque		
	PriorityQueue		
	TreeSet		
	HashSet		
	LinkedHashSet		
	Iterator , List Iterator		
	Introduction to Map in Java		
	Map Heirarchy		
	HashMap		
	Other In-Built classes and Inbuilt methods under Map Heirarchy		
	Module8 exam - 25 MCQs		
9	Why Collection ?	Collection and Map API in Java	Week 9
	Collection Heirarchy		
	ArrayList		
	ArrayDeque		
	PriorityQueue		
	TreeSet		
	HashSet		
	LinkedHashSet		
	Iterator , List Iterator		
	Introduction to Map in Java		
	Map Heirarchy		
	HashMap		
	Other In-Built classes and Inbuilt methods under Map Heirarchy		
	Why Collection ?		

10	Need of Generics and Basics of Generics	Generics and File-handling	Week 10
	More on Generics in Java		
	Collections class and it's inbuilt methods in Java		
	Comparable vs Comparator		
	Input Stream		
	Output Stream		
	File Operation in Java		
	Module10 exam - 25 MCQs		
	Milestone - 01 Exam - 100 MCQs		
11	Git Introduction	Git and GitHub	Week 11
	Types of Version Control System		
	Git Installation (Git vs Git Hub)		
	Git Architechture		
	Git & GitHub lecture 2 Introduction		
	Basic git commands		
	GitHub Account Creation		
	git config command		
	Git ecosystem (Stage and Snapshots)		
	Pushing files from local to remote repository(GitHub)		
	Clone vs Pull		
	Git branch		
12	Time and Space Complexity	Complexity Analysis and Array	Week 12
	Recurrence Relation Solving		
	Introduction to 1D Array, Palindrome Problem		
	Reverse in an array, Missing Number		
	Duplicate Elements Finding		
	Introduction to 2D Array, Rotation		
	Prefix Sum		
13	Introduction to Recursion: Factorial and Fibonacci Series	Recursion	Week 13
	Power function, Power function using bits		
	Count of number of stairs		
14	Searching: Linear and Binary Search	Sorting, Searching and Bit Manipulation	Week 14
	Interview Problems: Lower Bound, Square Root		
	Sorting: Bubble, Insertion, Selection		
	Number System: Decimal, Binary, Octa, Hexadecimal		
	Operators(Left Shift, Right Shift, AND, OR, XOR, NOT)		
15	Subset Permutations and Combinations	Backtracking	Week 15
	Interview Problem: N-Queens		
	Interview Problem: Solving a Sudoko		
	Interview Problem: Rat in a Maze		
	Introduction to LL: Insertion and Deletion		

16	Reverse a Linked List (Iterative and Recursion)	Linked List	Week 16
	Cycle Detection in a Linked List		
	Middle of Linked List (Slow and Fast pointer technique)		
17	Introduction to HashMap, Collision Handling, Types of Hashmap	HashMap, Stack and Queue	Week 17
	Two Sum, First unique character in a String		
	Stack Intro, Valid parenthesis, Area under the histogram		
	Queue Intro, Sliding Window		
	Implementation of queue using stacks and vice-versa		
18	Intro to D&C, MergeSort	Divide and Conquer, Greedy Approach	Week 18
	QuickSort		
	Selection Procedure		
	Count of number of inversions		
	Intro to Greedy Algorithms, Job Scheduling		
	Merge Intervals, Fractional Knapsack		
19	Intro to Tree, Binary Tree	Tree	Week 19
	Traversal Algorithms: Inorder, Preorder, Postorder		
	Interview Problems - Height of Tree, Level Order of Tree		
	Interview Problems - Diameter of Tree, Symmetric Tree		
	Interview Problems - Max Path Sum, Least Common Ancestor in a Tree		
20	Intro to BST, Check BST	Binary Search Tree	Week 20
	Insertion and Search in BST		
	Deletion in BST		
	Interview Problem - Kth Smallest Element in BST		
21	Introduction Minheap and Maxheap	Priority Queue	Week 21
	Heapsort algorithm		
	Kth-largest elements, Maximum Product of three numbers in an array		
22	Introduction to Graphs, Adjacency List	Graph	Week 22
	Traversal of Graph: Depth First Search		
	Breadth First Search		
	Cycle Detection in a graph		
	Topological Sort		
23	Dijkstra's Algorithm	Graph	Week 23
	Minimum Spanning Tree: Kruskal		
	Prim's Algorithm		
24	Introduction to Dynamic Programming	Dynamic Programming	Week 24
	Fibonacci Series		
	Longest common subsequence		
	Longest increasing subsequence		
	0-1 Knapsack		
	Staircase problem		
	Matrix Chain Multiplication		

25	Coin change	Dynamic Programming	Week 25
	Sum of Subset		
	Catalan Number - Unique BST		
Milestone 3 DSA Exam			
26	DRY principles	Design Principles	Week 26
	KISS principles		
	SOLID principles		
	CUPID principles		
	OOPS overview		
	The Singleton Pattern part 1		
	The Singleton Pattern part 2		
The Singleton Pattern part 3			
27	System Design Basics	System Design part 1	Week 27
	Key Characteristics of Distributed Systems		
	Load Balancing		
	Client—Server Model		
	Network Protocols		
	Storage		
	Latency And Throughput		
	Availability		
	Caching		
	Data Partitioning		
	Indexes, Replication , Sharding		
	Proxies, Redundancy		
28	SQL vs. NoSQL	System Design part 2	Week 28
	CAP Theorem		
	Web Applications		
	Web App architectures : Monolithic SoA Micro Services		
	Consistent Hashing		
	Long Polling vs WebSockets vs Server Sent Events		
	Bloom Filters		
	Quorum, Leader and Follower, Heartbeat, Checksum		
	Rate Limiting		
	Logging And Monitoring		
	Security And HTTPS		
	API Design		
Milestone 4 Exam			
	Basic Concepts of DBMS		
	Exploring Relational DBMS		
	Introduction to SQL		
	DDL and DML Statements		

29	Working with Queries (DQL)	Database	Week 29
	CRUD operations		
	Working with Constraints		
	Joins and Set Operations		
	What is mongoDB?		
	How does mongoDB works		
	Create and Read operation in MongoDB		
	CRUD operations in mongoDB		
30	Introduction to JDBC	JDBC	Week 30
	Steps followed to write JDBC Code		
	Basics of JDBC - 1		
	Deep dive into JDBC - 2		
31	Client Server Architecture	Application Development with Servlets	Week 31
	Different types of Server a. web server b. application server		
	Need of Servlet and Different ways of Creating a Servlet		
	First Servlet		
	Servlet life cycle		
	XML and Annotation support		
	Difference b/w ServletConfig vs ServletContext object		
	HttpServletRequest, HttpServletResponse		
	RequestDispatching		
	Filters, Listeners		
	MVC (Model-View-Controller)		
	Servlet Application with MVC Design Pattern		
32	Limitation of JDBC	ORM(Hibernate)	Week 32
	Need of ORM		
	Hibernate Features		
	Hibernate Architecture		
	Steps to prepare First Hibernate Application		
	Hibernate Persistence Object Lifecycle		
	Connection Pooling in Hibernate		
	Bulk Operations		
	Caching in hibernate		
33	Need of spring framework	Spring Framework part 1	Week 33
	IOC container		
	BeanFactory Vs ApplicationContext Container		
	Dependency Injection a) Setter Injection b) Constructor Injection c) Field Injection		
	Need of spring boot		
	Difference between spring & spring boot		
	Advantages with Micro Services		
	Building Spring Boot Application		
	Understanding the Spring Boot autoconfiguration		

