

## Lesson Plan – Advanced Java & Spring Framework

Session	Topic	Subtopics	Date
1	Introduction to JDBC	- JDBC API Overview - Types of JDBC Drivers - Setting up Database Connection	25 <sup>th</sup> August 2025
2	JDBC Operations	- CRUD Operations using Statement & PreparedStatement - ResultSet Handling - Transaction Management - Batch Processing - DAO Pattern using JDBC	26 <sup>th</sup> August 2025
3	Stream API	Functional Interface, Lambda Expression, Stream API	27 <sup>th</sup> August 2025
4	JUnit Basics	- Introduction to Unit Testing - JUnit Annotations (@Test, @Before, @After) - Writing Simple Test Cases	28 <sup>th</sup> August 2025
5	Hibernate	Introduction, Architecture, Hibernate using Annotations and XML, Hibernate Mapping (One-to-One, One-to-Many, Many-to-One, Many-to-Many).	29 <sup>th</sup> August 2025
6	Hibernate	Collection Mapping in Hibernate: List, Set, Map, Hibernate Caching (First Level Cache, Second Level Cache).	1 <sup>st</sup> September 2025
7	Spring Core & IoC	- Spring Framework Overview - Inversion of Control (IoC) - Dependency Injection (Constructor & Setter)	2 <sup>nd</sup> September 2025
8	Spring JDBC Template	Spring JDBC Template: PreparedStatement, ResultSetExtractor, RowMapper, NamedParameter, SimpleJdbcTemplate, Spring ORM.	3 <sup>rd</sup> September 2025
9	Spring MVC Basics	- Spring MVC Architecture - Controllers, Views, and Models - Form Handling	4 <sup>th</sup> September 2025
10	Spring Boot	- Introduction to Spring Boot - Auto Configuration - Building REST APIs - Connecting with Hibernate	5 <sup>th</sup> September 2025
11	Spring Data JPA & MongoDB	- JPA Repository Basics - MongoDB Repository Integration - CRUD with Spring Data	8 <sup>th</sup> September 2025
12	Spring Microservices & Tools	- Introduction to Microservices Architecture - Spring Cloud (Config, Eureka, Gateway) - Maven for Build & Dependency Management	9 <sup>th</sup> September 2025

**Assessment Plan:**

**Assessment Dates:** 26<sup>th</sup> August 2025, 28<sup>th</sup> August 2025, 2<sup>nd</sup> September 2025 and 4<sup>th</sup> September 2025

**Online CBT:** Based on MCQs and Logic Building Problems (covering the topics: Introduction to Java, OOPS using JAVA, Exception Handling, Wrapper classes, String class, Collection Framework, JAVA8 Features).

**Other Topics:** JDBC, Junit, ORM, Hibernate, Spring, Spring JDBC, Spring Boot.

## **Additional Problem Statements**

### **Challenges:**

#### **Module 1:**

1. Employee Information
2. A Video Rental Inventory System
3. Electricity bill Calculation
3. Interest Calculator
4. String based problems

#### **Module 2:**

1. Hare and Tortoise Race
2. Collect and Group Cards
3. Collect Unique Symbols from Set of Cards
4. IOStreams
5. Inventory and Sales System

#### **Module 3:**

1. Online Auction
2. Login Module
3. Project\_XML
4. JSON

#### **Module 4:**

1. CRUD Operation (Servlet, JSP, Hibernate)
2. Hibernate using Annotations and XML
3. Hibernate Mapping
4. Collection Mapping in Hibernate

#### **Module 5:**

1. CRUD Operation (spring)
2. Login & Registration Application

#### **Module 6:**

1. Spring MVC
2. Spring Boot JDBC

### **Mini project:**

1. Hockey Scores
2. Lego Set Competition
3. Maze Navigator
4. Word Guesser
5. Management related projects (IO Streams)
6. Management System related Projects in Servlets/JSP
7. Management System related Projects in Hibernate
8. Spring MVC CRUD Operations
9. Restful Web Services Spring Boot

### **Note:**

Logic Building exercises on mettl platform.