JAVA EE with Glassfish

Duration: 10 days

Course Topics

DAY 1 — Core Java Refresher: OOP Concepts & Object-Oriented Foundations

Demonstration (4 hrs):

- Overview of Classes, Objects, and Real-World Object Modeling
- Understanding Constructors and the Purpose of Constructor Overloading
- Applying Encapsulation to Secure and Manage Internal Data
- Using Inheritance for Hierarchical Class Relationships and Reusability
- Implementing Polymorphism for Flexible and Dynamic Method Behavior
- Abstraction Concepts through Interfaces and Abstract Classes
- Using Access Modifiers to Structure Visibility and Accessibility

Lab Practice (4 hrs):

- OOP programs using inheritance, interfaces, abstraction, and polymorphism.

DAY 2 — Core Java Refresher: Collections, Generics, and Exception + JDBC

Demonstration (4 hrs):

- Overview of Java Collections Framework and Its Common Implementations
- Working with ArrayList, LinkedList, HashSet, and TreeSet for Data Handling
- Using HashMap and TreeMap for Efficient Key–Value Data Management
- Applying Comparable and Comparator Interfaces for Object Sorting
- Understanding try–catch–finally and Custom Exceptions in Applications
- Introduction to JDBC API for Connecting Java Applications to Databases

Lab Practice (4 hrs):

- Sorting with Comparator, HashMap usage in app, Try-with-resources + JDBC insert/select.

DAY 3 — Java EE Overview and GlassFish Server Environment Setup

Demonstration (4 hrs):

- Understanding Java EE Multi-Tier Architecture and Application Layers

- Structure of Web Applications Including Servlets, JSP, and Static Components

- HTTP Request–Response Cycle and Web Communication Flow

- Role Differences Between Servlet, JSP, and EJB in Enterprise Applications

- Installation and Walkthrough of GlassFish Application Server

Lab Practice (4 hrs):

- Create first servlet-based application and deploy on GlassFish.

DAY 4 — Servlets Fundamentals and HTTP Request Processing

Demonstration (4 hrs):

- Servlet Lifecycle Including Initialization, Request Handling, and Destruction

- Handling GET and POST Requests for Form Submission and Data Transfer

- Working with Request and Response Objects for Input and Output Processing

- Using ServletConfig and ServletContext for Application Configuration

Lab Practice (4 hrs):

- Create servlet handling forms + servlet context/config demo.

DAY 5 — Advanced Servlets with Filters, Dispatching, and File Handling

Demonstration (4 hrs):

- Building Servlet Filters for Authentication, Logging, and Preprocessing Needs

- Forwarding and Including Resources Using RequestDispatcher Mechanism

- Implementing Custom Error Pages for Application-Level Exception Handling

- Developing File Upload and File Download Features in Servlets

- Thread-Safety Concepts in Multi-Threaded Servlet Environments

Lab Practice (4 hrs):

- Create authentication filter, dispatcher demo, file upload/download.

DAY 6 — JSP Basics and Server-Side UI Development

Demonstration (4 hrs):

- Understanding JSP Lifecycle from Translation to Execution Phase

- Using JSP Scripting Elements for Dynamic HTML Content Creation

- Working with JSP Directives for Imports, Error Handling, and Tag Libraries

- Using JSP Implicit Objects to Access Request, Session, and Application Data

- Integrating JavaBeans into JSP Pages for Cleaner Data Management

Lab Practice (4 hrs):

- JSP + JavaBean binding, implicit objects demo.

DAY 7 — Advanced JSP Using EL, JSTL, and MVC-Based Web Design

Demonstration (4 hrs):

- Using Expression Language (EL) for Cleaner and More Readable JSP Pages

- Applying JSTL Core Tags for Loops, Conditional Checks, and Formatting

- Introduction to Creating Custom Tags for Reusable Interface Components

- Implementing MVC Pattern with Servlets as Controllers and JSP as Views

Lab Practice (4 hrs):

- Rewrite JSP using EL/JSTL + MVC request flow.

DAY 8 — Introduction to EJB with DI and Enterprise Business Components

Demonstration (4 hrs):

- Overview of Enterprise JavaBeans for Modular and Reusable Business Logic

- Difference Between Stateless and Stateful Session Beans and Their Use Cases

- Introduction to Message-Driven Beans (MDB) for Asynchronous Processing

- Understanding the Lifecycle of EJB Components Managed by the Container

Lab Practice (4 hrs):

- Create and consume stateless and stateful beans from servlets.

DAY 9 — JPA Basics and Persistence with EntityManager Demonstration (4 hrs):

- Introduction to JPA for Object-Relational Mapping and Data Persistence

- Defining Entities, Identifiers, Relationships, and Persistence Units

- Using EntityManager for CRUD Operations in Enterprise Applications

- Understanding JPA Queries Using JPQL and TypedQuery

Lab Practice (4 hrs):

- Creating JPA entities + basic CRUD via EntityManager.

DAY 10 —GlassFish Administration and Enterprise Deployment

- Working with Servlet Listeners for Application and Session Lifecycle Events

- Implementing Session Tracking Using Cookies, URL Rewriting, and Session IDs

- Creating JDBC Connection Pools for Efficient Database Connectivity

- Configuring JDBC Resources Mapped Through JNDI for Web/EJB Applications

- Deploying Web Applications Using WAR and Enterprise Apps Using EAR

Lab Practice (4 hrs):

- Create listeners , security filter ,JDBC pool, deploy WAR.