

# ***Advanced Java (J2EE)***

**Objective:** To write the web based application using J2EE (Struts, Hibernate, Spring and Spring Boot) Framework.

**Pre-requisites:** To know the basic fundamentals of object oriented programming language and Java programming language

## **Session 1 (Introduction to JDBC)**

- Introduction to JDBC, JDBC Architecture, Types of Drivers
- Statement and ResultSet
- PreparedStatement and Connection, Save Point and Batch Updates
- CallableStatement and BLOB and CLOB
- Project Development using JDBC

## **Session 2 (Working with JavaMail API)**

- Introduction to Java Mail API
- Configuring Java Mail API and Sending Mail with Attachments
- Terminologies of JavaMail API

## **Session 3 and 4 (Servlet Programming)**

- Introduction: What and Why?
- Web Application Architecture
- Web Application Development, HTML-Servlet Communication
- Container Life Cycle, Web Server and Containers
- HTTP Protocol, Understanding Servlet API, Servlet Life Cycle
- Servlet to DB Communication, Servlet to Servlet Communication
- Session Tracking: Cookies, Hidden Fields, URL Rewriting, HttpSession
- Servlet Listeners, Servlet Filters and Wrappers
- File Uploading and Downloading
- Annotation based servlet programming, Web Security
- Deployment of Web Application on the Web Server
- Project Development based on Servlet

## **Session 5 and 6 (JSP – Java Server Pages)**

- Introduction to JSP, JSP Lifecycle
- JSP Implicit Objects and Scopes, JSP Scripting Tags

- JSP Directive Tags, JSP Action: Standard Actions, Custom Action
- JSP using JavaBeans JSTL
- Custom Actions and Tag Library in JSP
- JSP with AJAX, Understanding MVC Architecture
- Implement MVC based web application using servlet, JSP and JavaBeans
- Session Tracking – Cookies, Hidden Form Fields, URL Rewriting and HttpSession
- Project Development using JSP

### **Session 7 and 8 (EJB and RMI)**

- Overview of the JAVAEE Architecture 1, 2 and 3
- The EJB Model
- The Services of the Application Server
- Developing Session Beans – Stateless Session Beans, Stateful Session Beans
- Packaging and Writing
- Introduction to RMI, RMI Execution Flow, RMI with database
- Project Development using RMI and EJB

### **Session 9 and 10 (Hibernate)**

- Hibernate Introduction
- Hibernate Architecture
- Understanding First Hibernate
- Hibernate with Annotation, Hibernate Web Application, Hibernate Generator Class
- Hibernate Dialects, Hibernate Configuration and Mapping
- Hibernate Relations – One to One, One to Many, Many to One, Many to Many
- HQL (Hibernate Query Language)

### **Session 11 to 12 (Struts Framework Overview)**

- Introduction: What and Why?
- Struts Architecture, Steps to create Struts 2 Application
- Understanding Action Class
- Understanding struts.xml, web.xml files
- Building web pages using Struts 2 and Servlet
- Core Components – Interceptors, Action Invocations, Action Interface
- ActionSupport Class, Struts with Hibernate, Abstract Classes
- Project Development with Struts Framework

### **Session 13 and 14 (Spring Framework Overview)**

- Why Spring?
- Overview of Spring 3 Architecture
- Spring Modules Overview, Spring MVC Architecture
- Understanding Spring 3 Annotations, Spring Applications
- Multiple Controller, Request Response
- MVC Form Examples, MVC CRUD Example
- Deployment of Web Application using Spring MVC Module
- Integration of Spring Module with Hibernate
- Web Services using Spring
- Project Development using Spring Framework

### **Session 15 (Project Development)**

- Requirement Analysis, Designing Templates, Designing Database
- Working with MVC Architecture, Make Your Project Dynamic with J2EE
- Working with FTP, Hosting of Project, Debugging with Develop Tools of browser
- Testing the Project

### **Session 16 (Spring Boot Introduction)**

- What is Micro Service, Pre-requisites, What is Spring Boot, How does it work
- Spring Boot Starters, Auto Configuration, Spring Boot Application
- Spring Initializer, Class Path Dependencies, Main Method
- Write a Rest Endpoint, Create an Executable JAR
- Run Hello World with Java
- Dependency Management and Maven Dependency

### **Session 17 and 18 (Building RESTFUL Web Services)**

- Rest Controller, Request Mapping, Request Body, Path Variable
- Request Parameter, Restful APIs

### **Session 19 (ThymeLeaf)**

- Thymeleaf Templates
- Web Application

### **Session 20 (Database Handling)**

- Introduction to MongoDB and NoSQL, Introduction to JSON/BSON
- Data Modelling in MongoDB, Backup Strategies, Advantages of NoSQL over SQL
- MongoDB Security Concepts, Connection to MongoDB, Spring Boot MongoDB Document File