

## J2EE Syllabus

### **Overview:**

Java is a language and J2EE is a platform which implements java language. J2EE standard for Java 2 Enterprise Edition. Core Java and advanced java are the standard editions of java whereas J2EE is the enterprise edition which is a combination of both core & advanced java. It is used for creating enterprise web applications. J2EE makes use of Servlets and JSPs to provide enterprise applications like web pages and portals.

### **Course Objectives:**

- ❖ To understand the importance of extension JDBC package in Enterprise Java applications.
- ❖ To understand and use the Java Persistence Architecture API for ORM activities (JPA).
- ❖ To implement asynchronous applications and MessageDriven Beans using JMS.
- ❖ To apply Security in Java EE Applications.
- ❖ To learn send/receive mails using Internet protocols SMTP, IMAP and POP3 (JavaMail).
- ❖ To master the whole process of designing, implementing and deploying J2EE Applications.
- ❖ To Understand SOAP, Web Services and Service Oriented Architecture (SOA)
- ❖ .To implement and access Web Service components using EJB in a Java EE application.

### **Pre-requisite / Target Audience:**

This course is designed to meet the needs of Java programmers who want to be professional in building mission-critical enterprise software using EJB. Students should be familiar with programming techniques and have substantial Java programming experience including JDBC, RMI, Servlets and JSP.

### **Module 1: Remote Method Invocation (RMI)**

RMI is mostly used in distributed applications. In this module you will learn how client and server communicate through remote objects.

- ❖ Object Persistence and Serialization
- ❖ Introduction to Distributed Computing
- ❖ RMI Architecture
- ❖ Importance of RMI Registry
- ❖ Developing Simple RMI application
- ❖ Callback Implementation in RMI

### **Module 2: CORBA**

In this module you will learn, how corba is used to establish the communication between distributed objects in different platforms either by remotely or locally.

- ❖ Introduction to CORBA
- ❖ CORBA for Distributed computing
- ❖ ORB & IIOP
- ❖ Interface Definition Language (IDL)

### **Module 3: Java EE Application**

In this module you will learn how to create a multi-tier architecture and how to distribute each tier in their particular server or machine.

- ❖ Java EE Architecture
- ❖ Introduction to Java EE Components, Containers and Connectors
- ❖ Connectors
- ❖ Java EE Modules (Web App, EJB JAR, App Client)
- ❖ Structure of Java EE Application (Enterprise Archive)
- ❖ Packaging and Deploying Java EE Applications

### **Module 4: JNDI (Java Naming and Directory Interface)**

JNDI is an API that provides naming and directory functionality to the application. In this module you will learn how to use JNDI Services in your application.

- ❖ Introduction to Naming Services
- ❖ JNDI as Java API to Naming Services
- ❖ Using JNDI

### **Module 5: JDBC Extension**

In this module you will learn the new features of jdbc and how to send multiple connection objects to resource pool and how it is shared among different clients.

- ❖ javax.sql package (Extension to JDBC)
- ❖ DataSource and Connection Pool
- ❖ Using JDBC and JNDI

### **Module 6: Enterprise JavaBeans [EJB 3]**

In this module you will learn how ejb become a part of the multi layered architecture. And how it will interact with the database.

- ❖ Introduction to Server-Side Components

- ❖ EJB Design Goals and Roles
- ❖ EJB Architecture
- ❖ Simplified EJB 3 API
- ❖ Metadata Annotations in place of XML
- ❖ RMI over IIOP

**Types of EJB**

- ❖ Session Bean
- ❖ MessageDriven Bean
- ❖ Entity Bean

**EJB Container Services**

- ❖ Transactions
- ❖ Security
- ❖ Life Cycle Management
- ❖ State and Persistence of EJB

**Session Beans**

- ❖ Role of Business Interface
- ❖ Remote and Local Interfaces
- ❖ Session Bean Lifetime
- ❖ Developing Stateless Beans
- ❖ Developing Stateful Beans
- ❖ Standalone and Web Clients

**Module 7: Java Persistence API (JPA)**

Jpa provides a framework which helps us to store a vast amount of data into a database there is no need to write relational models.

- ❖ Designing Persistent Class
- ❖ Entity Fields and Properties
- ❖ Entity Instance Creation
- ❖ Primary Keys and Entity Identity
- ❖ Entity Relationships
- ❖ Entity Operations
- ❖ Entity Manager
- ❖ Entity Instance Life Cycle
- ❖ Persistence Context

- ❖ Query API
- ❖ Query Language

### **Module 8: Java Transaction Management (JTA)**

In this module you will learn how to perform series of operations on different data sources simultaneously.

- ❖ The ACID Test for Transactions
- ❖ Introduction to JTS & JTA
- ❖ Container-Managed Transactions
- ❖ Bean-Managed Transactions
- ❖ Transaction Attributes
- ❖ Using JTA

### **Module 9: Security Model**

In this module you will learn how to provide security for different layers present in the web server.

- ❖ Role-Driven Access Control
- ❖ Security Identity
- ❖ Security and the Deployment Descriptor
- ❖ Using Security Roles
- ❖ Accessing Security Information via EJBContext
- ❖ Using JAAS to access secure EJB

### **Module 10: Java Message Service (JMS)**

In this module you will learn how to create/send/read messages from one application to another.

Introduction to Messaging Systems.

- ❖ Benefits of using JMS
- ❖ Pub/Sub Model
- ❖ Point-to-Point Model
- ❖ Message Formats, Headers & Properties
- ❖ How JMS fits into EJB system
- ❖ Developing Message Driven Beans (MDB)

### **Module 11: Web Services**

In this module you will learn how web services will make different applications to communicate over the internet/to convert standalone application to web application.

- ❖ Introduction to Web Services
- ❖ Service Oriented Architecture

- ❖ Architecture and Advantages
- ❖ SOAP Significance
- ❖ WSDL Importance
- ❖ Web Service Annotations
- ❖ Implementing a Web Service
- ❖ Java API for XML Web Services (JAX-WS)
- ❖ Writing a Web Service Client

**Real-time Project involving most of the above concepts with following will be provided**

- Product Abstract Document
- Requirement Specification Document
- **Step-by-Step procedure for building the project from ground up by using IDE.**
- Complete Source Code

**At the end of the course participants will get the knowledge of:**

Creating your own web application and you can able to know how to utilize the various available resources without need of other's help.