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# JAVA / J2EE Course Content

## **Introduction**

Introduction to Java

## **Language Fundamentals**

Features of Java Language.

JVM –The heart of Java

## **The Java Environment:**

Installing Java.

Java - Environment Setup

Java Program Development

Compilation

Executions.

## **Basic Language Elements:**

Lexical Tokens, Identifiers

Keywords, Literals, Comments

Primitive Datatypes, Operators

Assignments.

### **Java Basics:**

Java - Loop Control

Java - Decision Making

Java - Numbers

Java - Characters

Java - Strings

Java - Arrays

Java - Date & Time

Java - Regular Expressions

Java - Methods

### **Object Oriented Programming**

Class Fundamentals.

Object & Object reference.

Memory architecture of java program.

Object Life time & Garbage Collection.

Creating and Operating Objects.

Constructor & initialization code block.

Access Control, Modifiers, methods

Nested , Inner Class & Anonymous Classes

Abstract Class & Interfaces

Defining Methods, Argument Passing Mechanism

Method Overloading, Recursion.

Dealing with Static Members. Finalize() Method.

Native Method. Use of "this " reference.

Use of Modifiers with Classes & Methods.

Generic Class Types

### **Extending Classes and Inheritance**

Use and Benefits of Inheritance in OOP

Types of Inheritance in Java

Inheriting Data Members and Methods

Role of Constructors in inheritance

Overriding Super Class Methods.

Use of “super”.

Polymorphism in inheritance.

Type Compatibility and Conversion

Implementing interfaces.

### **Package**

Organizing Classes and Interfaces in Packages.

Package as Access Protection

Defining Package.

CLASSPATH Setting for Packages.

Making JAR Files for Library Packages

Import and Static Import

Naming Convention For Packages

### **Exception Handling:**

The Idea behind Exception

Exceptions & Errors

Types of Exception

Control Flow In Exceptions

Use of try, catch, finally, throw, throws in Exception Handling.

In-built and User Defined Exceptions

Checked and Un-Checked Exceptions

**Arrays & Strings**

**Threads & Synchronization**

**Serialization**

**Collections**

**File I/O Basics**

**Event Handling**

**Introduction to J2EE**

**J2EE Overview**

**Why J2EE?**

**J2EE Architecture**

**J2EE APIs**

**J2EE Containers**

## **Java Server Technologies**

**Servlets**

Web Application Basics.

Architecture and challenges of Web Application.

Introduction to servlet

Servlet life cycle

Developing and Deploying Servlets

Exploring Deployment Descriptor (web.xml).

Handling Request and Response

Initializing a Servlet

Accessing Database

Servlet Chaining

Session Tracking & Management

Dealing with cookies

Transferring Request  
Accessing Web Context  
Passing INIT and CONTEXT Parameter  
Sharing information using scope object  
Controlling concurrent access  
User Authentication  
Filtering Request and Response  
Programming Filter  
Filter Mapping  
Servlet Listeners  
Java Server Pages:

## **JSP**

Basic JSP Architecture  
Life Cycle of JSP (Translation, compilation)  
JSP Tags and Expressions  
Role of JSP in MVC-2  
JSP with Database  
JSP Implicit Objects  
Tag Libraries  
JSP Expression Language (EL)  
Using Custom Tag  
JSP Capabilities:  
Exception Handling  
Session Management  
Directives  
JSP with Java Bean

## **JDBC**

What is JDBC?

Types of JDBC

Connecting to Database

Retrieving and Updating data

**SQL**

**MySQL**

**HTML**

**CSS**

**JavaScript**

**Ajax**

**Hibernate**

What is Hibernate?

Understanding EntityRelationship

Writing Entities

Mapping Entities

Synchronizing with Database

Using Hibernate with Applications

**Spring IOC module**