

# Outline of Course: **JAVA Core**

## **1- INTRODUCTION TO JAVA**

An overview of JAVA, History and Evolution, Features of JAVA Environment, The Java Architecture, JAVA Development Kit (JDK). Types of Java Program, Compilation and Execution.

## **2- DATA TYPES AND OPERATORS IN JAVA**

Primitive Data Types and Declaration of Variable, Variables, Type Casting and Data Conversion, Non Primitive Data Type. Operators, Operator Precedence

## **3- CONTROL FLOW STATEMENTS**

Control Statements, Conditional (if) Statements, Adding else if, Selective (switch) Statement, Iterative (looping) Statements. Enhanced for/for- each Loop. The break and continue statement, Input in Java (Command Line and Interactive Input)

## **4- INTRODUCTION TO OBJECT ORIENTED PROGRAMMING (OOPs)**

### **CLASSES AND OBJECTS**

Class – An Introduction, Defining a class, creating an object, accessing of data and method of class. Constructors, Garbage Collection, The *finalize* () Method, A Stack Class Constructor overloading, The *this*, *super* References, Recursion, Access Modifiers, Inner Classes.

## **5- INHERITACE**

Basic of Inheritance, Supper class Variable and Sub Class Objects. Types of Inheritance. Method overriding .Dynamic Method Dispatch. Modifiers, Using Final with Inheritance. The Object Class. Using Abstract classes.

## **6- POLYMORPHISM**

Introduction to Polymorphism, Types, implementation of Method Overloading, Constructor Overloading, Method Overriding.

## **7-ARRAY**

Array Introduction, Types , Demonstration, Implementation, Programming exercise.

## **8- STRING HANDLING**

The String Constructor, Special String operation (pre define methods of string class) character extraction. String searching and comparison data conversion using *valueOf()*Method. The *StringBuffer* Class, *StringBuilder* Class.

## **9- MODIFIERS**

Implementation Of Modifiers such as abstract, static, final, native, volatile, synchronized, transient, strictfp, nested Class, Member inner Class, Anonymous Inner Class, Local Inner Class, Static Nested Class.

## **10- INTERFACES**

Interfaces: Defining an Interface, Implementing a Interface, Applying interface, Variable in Interface, Method in Interface, Exploring the properties of Interface, Implementing Multiple Inheritance using Interface, Nested Interface.

## **11- PACKAGEGES**

Packages: Defining a package, Understanding a class Path, Importing a package, creating nested Package. Exploring Access Modifier(private, default, protected, public) context of package.

## **12- MULTITHREADING**

The Java Thread Model, Creation of Thread, Thread State, Predefine Methods of Thread, Thread Priorities Synchronization. Inter Thread Communication.

## **13- EXCEPTION HANDLING**

Exception Handling fundamentals, Exception Types. Using try and catch java built-in Exception, Java Uncaught Exception, User Defined exception subclass.

## **14- EXPLORING JAVA LANG PACKAGE**

Wrapper Classes, Runtime Memory Management Array copy.Object.clone() and the Cloneable interface, Class and class loader Math Functions. Security manager .

## **15- COLLECTION FRAMEWORK(java.util)**

The Enumeration interface. Vector and Stack Dictionary. Hash table. StringTokenizer, Calendar BitSet, Date, Date comparison, String and time zones Random, Observer interface, Set, List, Queue, Deque and classes, ArrayList, Vector, LinkedList, PriorityQueue, HashSet, LinkedHashSet, TreeSet.

## **16- INPUT/OUTPUT- EXPLORING JAVA I/O(STREAM and FILES)**

The Java I/O classes and Interface. FilenameFilter and Directories. I/O stream classes – File Input Stream, File Output Stream, Byte Input Stream. Filtered Stream s Buffered Stream – Buffered Input Stream, Buffered Output Stream, Sequence Input Stream Print Stream. Random Access Files.

## **17- JAVA NEW FEATURES**

Assertion, Auto Boxing and UnBoxing, static import, Enum Type, Annotation

# Outline of Training: Software Development Using Java

## **1- Introduction to java applets**

What is java applet, Applet lifecycle method, Applets and Using HTML converter, Graphics class, Color class, Font Class, FontMetrics class, Multithreading in Applet.

## **2- AWT: Component and Container**

Exploring java.awt package (program using each component), AWT Controls,

## **3- Layout Management and event Handling**

Layout Management Policies, Standard Layout Manager: Grid Layout, Border Layout, Box Layout, Flow Layout, Card Layout, Absolute Layout, Handling Event, Hierarchy Of Event Classes, Event Delegation Model , Event Classes, Event Listener Interfaces , Adapter Classes.

## **4- Swing**

Introduction to JFC, The swing and awt, structure of swing application, top level swing container, Lightweight Containers, Basic Swing Components, Advance swing components.

## **5- Network programming**

Java.net package ,Sockets , Clients – server programming ,Mapping stream to Sockets ,Building a multithreaded client server system ,Distributed object , Specifying remote interface ,Distributed java objects ,Using RMI compiler Specifying security policies Installing security managers, URL class, Displaying Data of Web Page, InetAddress class, DatagramSocket and DatagramPacket, Two Way Communication.

## **6- Java DataBase Connectivity (JDBC)**

Java JDBC Drivers, Steps to Connect to the Database, Connectivity with Oracle, MySQL, Sqlite Driver Manager, Connection Interface, Statement Interface, ResultSet Interface, Prepared Statement Interface, Fundamentals of Database Programming, ResultSetMetaData, DatabaseMetaData, Storing Image, Retrieving Image, Storing File, Retrieving File, Stored Procedures and Functions, Transaction Management, JDBC New Features.

## **7- Internet Technology Overview**

Overview of internet related concepts TCP/ IP, DNS, Overview of HTTP protocol

## **8- Java Beans**

Introduction, using the BDK Demonstration Beans, saving and Restraining Beans, Building an Applet from Beans, Create your Bean

## **9- Java Reflection**

Reflection programming ,Concept of a “Meta” class ,Benefits of meta programming  
Runtime representation of classes ,Dynamic loading of classes ,Instantiating object programmatically ,Representing methods

## **10- Introduction to Netbeans.**

Getting Started with NetBeans, Creating a Project, Creating a Class, Compiling a Class, Running a Java Application, Running Examples Like Login and Registration.  
Using Components of Netbeans: Swing Container, Swing Controls, Swing Menus, Swing Windows, Swing Fillers, AWT, Beans, Java Persistence, Using Properties of Each and Every Single Component, Using Packages.

## **11- Software Development using Netbeans (Project).**

Creating a Project with Custom GUI called LAF(Look and Feel), Using Internal and External API's, Report Generation with Jasper Reports or iText Reports, Connection with DataBase via JDBC, Working with Both Database Embedded(Sqlite) Or Non-Embedded(MySql), Run Java Applications from the Command Line, Debugging in NetBeans, Deployment in Netbeans, Cleaning and Building Projects, Making **JAR** to **EXE** of a Project, Making Installer of EXE as a Independent Software Running Software in any System.

# **LIVE PROJECT**

# **Industrial Training Module On Java/J2EE**

## **HTML 5.0, CSS 3.0, Bootstrap Designing of a Website**

### **Servlet 3.0**

Need of Server side Programming, Introduction to Servlets, Servlet Life Cycle, javax.servlet package, ServletConfig, ServletContext, ServletResponse, Supplying initialization parameters to Servlets, Performing database operations in Servlets, Include and forward mechanisms, Applying filters to Servlets, javax.servlet.http Package, HttpServlet Life Cycle, Http request methods GET vs POST, HttpServletRequest, HttpServletResponse, Dealing with Http headers & error codes, Session Tracking, purpose, Hidden form fields, Cookies, Http Session, URL rewriting, Event listeners, Web application security,

### **Java database connectivity (JDBC)**

Fundamentals of database programming , Connection , statements , ResultSet , Metadata Data base meta data, Resultset metadata scrollable result sets ,Accessing transaction manager , Two phase commit , data sources ,Connection Pools.

#### **LIVE PROJECT**

### **JSP 2.2**

Disadvantages of Servlets, Introduction to JSP, JSP Life Cycle, Creating dynamic Web content with JSP, Scripting elements, Scriptlet, Declaration, Expression, XML syntax for JSP elements, JSP directives page, include and taglib, JSP implicit objects, JSP scopes, Include and forward mechanism, Using a Java bean in a jsp, JSP Model 1 architecture, JSP Model 2 (MVC) architecture, Custom Tag Development, Classic Tags, Simple Tags, Error Handling in a jsp, JSTL, Expression Language, XML in a JSP,

#### **LIVE PROJECT**

### **Enterprise Java Beans**

What is an EJB? , Why should you use, When should you not use , What's new in EJB 3.0 ? , Introduction to asynchronous beans, Introduction to the java message service (JMS) API,

#### **LIVE PROJECT**

### **Network programming**

Java .net package, Sockets , Clients – server programming, Mapping stream to sockets  
Building a multithreaded client server system, Distributed object, Specifying remote interface Distributed java objects, Using RMI compiler, Specifying security policies  
Installing security managers

#### **RMI-Remote Method Invocation**

Java Distributed Technology, RMI Architecture, Dynamic / Bootstrap Clients, Object Passing  
RMI, DGC, Activation, RMI -IIOP

in

## **Hibernate**

Advantages of Hibernate compared to JDBC, Introduction, ORM (Object Relational Mapping),  
Hibernate Resources, Configuration file, Mapping file, Persistent class or POJO, Client application,  
Transient object, Persistent object, Detached object, <list>, <set>, <map>, <bag>, Mapping array, Sorting  
collections, Programmatic transactions with JTA, Optimistic Concurrency control, Pessimistic Control.  
**LIVE PROJECT**

## **Spring MVC**

What is Spring, How Spring fits into the Enterprise world, Spring Modules  
Spring 3.0 features, Introduction to Spring MVC, Handler Mapping, Controllers, Validation, Handler  
Interceptors, Views, Form tags

## **Spring Boot**

Spring Boot Version Spring vs Spring Boot vs Spring MVCSB Architecture, Spring Initializer IDE Spring,  
Spring Boot CLISB Example-STS, AnnotationsSB Application PropertiesSB StartersSB Starter ParentSB,  
Starter WebSB Starter Data JPASB Starter ActuatorSB Starter TestSB DevToolsMulti Module ProjectSB  
,Packaging configuration, Hello Project, Spring Boot AOP Advice After, Spring Boot JPASpring Boot  
JDBCEXAMPLES Operations, View, Springs Spring, Applications', *Spring Boot –RESTful*, Spring Cloud.

## **JAVASCRIPT**

Introduction to JavaScript, Data types, Declaration of Variables, Operators, Control Statements, Conditional  
Statements, functions, event handling, DOM (Document Object Model), JS Objects (Array, String, Math,  
Date), JavaScript Validations. Object references and copying, Garbage collection, Object methods, "this",  
Constructor, operator "new", Optional chaining '?.', Symbol type, Object to primitive conversion, Recursion  
Object.

## **AJAX (Asynchronous JavaScript and XML)**

Introduction to AJAX, Understanding XMLHttpRequest Object, Working with Ajax functions,  
Combining HTML and AJAX, Combining PHP and AJAX.

## **JQUERY**

Introduction to JQuery, JQuery Syntax, JQuery Selectors, JQuery Events, JQuery Effects, JQuery HTML,  
JQuery AJAX.

## **Hibernate**

Advantages of Hibernate compared to JDBC, Introduction, ORM (Object Relational Mapping), Hibernate Resources, Configuration file, Mapping file, Persistent class or POJO, Client application, Transient object, Persistent object, Detached object, <list>, <set>, <map>, <bag>, Mapping array, Sorting collections, Programmatic transactions with JTA, Optimistic Concurrency control, Pessimistic Control.

### **LIVE PROJECT**

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Spring 3.0 features, Introduction to Spring MVC, Handler Mapping, Controllers, Validation, Handler Interceptors, Views, Form tags

## **Spring Boot**

Spring Boot Version Spring vs Spring Boot vs Spring MVCSB Architecture, Spring Initializer IDE Spring, Spring Boot CLISB Example-STS, AnnotationsSB Application PropertiesSB StartersSB Starter ParentSB, Starter WebSB Starter Data JPASB Starter ActuatorSB Starter TestSB DevToolsMulti Module ProjectSB ,Packaging configuration, Hello Project, Spring Boot AOP Advice After, Spring Boot JPASpring Boot JDBCExamplesOperations, View, Springs Spring, Applications', *Spring Boot* –RESTful, Spring Cloud.

## **SERVER TOOLS**

Tomcat-Apache, Glass Fish, JBoss

## **IDE Net Beans, My Eclipse**

