JAVA SYLLABUS FOR 6 MONTHS

Java 6-Months

INTRODUCTION TO JAVA

- Features of Java
- Java Virtual Machine
- Comparison of C, C++, and Java
- Java Versions and its domain areas
- Life cycle of Java program
- Writing first Java program
- Analyze the tokens of Java program

DATA TYPES, IDENTIFIERS AND VARIABLES

- Java data types
- The concept of Variables, Operators, and control Statements

INPUT/OUTPUT

- Getting Input from the keyboard using Scanner class
- Displaying Output with printf, println, and print methods

CLASSES & OBJECTS

- Oops Concepts
- Creating an Object
- Initializing an Instance Variable
- Access Specifiers
- Constructors & its Types

METHODS IN JAVA

- Method Prototype

- Static Methods
- Passing Parameters in Method (Primitives & Objects)

RELATIONSHIP BETWEEN OBJECTS

- Relating Objects using References
- Inner Classes

INHERITANCE & POLYMORPHISM

- Concept of Inheritance
- The 'this' and 'super' keyword
- Concept of Abstract Classes
- What is Abstract Method
- Concept of Interface
- Multiple Inheritance using Interface
- Abstract Class VS Interfaces

INNER CLASSES

- Features of Java
- What is inner class
- Need of inner classes
- Types of inner classes
- Implementation of inner classes (of all types) based on their requirement

PACKAGES

- Concept of Packages
- Need of packages
- How to create packages using compiler
- How to use packages
- Concept of JAR file
- How to create the JAR file
- Pack packages into JAR

STRINGS

- What is String
- Creating String literals and String object
- Methods of String class

- String immutability and its use

STRING BUFFER & STRING BUILDER

- What is String Buffer class
- String Buffer's constructor and methods
- What is String Builder's Class and its usage

EXCEPTION HANDLING

- What is Exception in Java
- Need of exception in Java
- The try/catch/throw/throws/finally keywords
- Multiple Exceptions
- Custom Exception
- Assertions in Java and their usage

MULTI THREADING

- What is a Java thread
- Need of thread in Java
- The constructor and methods of Thread class
- Life cycle of Java thread
- Writing Thread using Thread Class and Runnable Interface
- Daemon and Non-Daemon threads
- Synchronization in java
- Thread collaboration
- Writing a real life application using multi-threads

INPUT AND OUTPUT IN JAVA

- What is IO
- Need of IO
- Different types of IO (like from/to Buffer-pipes-files-network etc)
- How to implement IO using different types of classes (like Stream/Reader/Writer)
- Concept of Serialization
- Need of Serialization
- How to implement it
- Customizing the Serialization (using Externalizable interface)
- Need of Customizing the Serialization

- How to implement it

The Graphical User Interface (GUI) programming in Java

The AWT (The Abstract Window Toolkit)

- Concept of AWT
- Need of AWT
- How to implement the GUI based programs using AWT)

The light-weight GUI

The Swings

- The concept of Swings
- Need of Swings (Even if AWT is already there to implement the GUI)
- How to implement the GUI based application using Swings

DATABASE CONNECTIVITY (The JDBC)

- Concepts of JDBC
- Need Of JDBC
- Types Of JDBC Driver
- Type1: JDBC-ODBC Driver
- Type2: Native Driver
- Type3: Network Driver
- Type4: Pure Java Driver
- Difference between the JDBC Drivers
- Connecting with Databases (Access, My Sql, and Oracle)
- Implementing Collection Framework with Databases

Project 1:

- Implementation of a GUI based project. This project will be the combination of Java Swings (for implementing the GUI) and the Java Database Connectivity (for fetching/storing the data from the database)

Reflection API

- What is reflection API
- Need of reflection
- The Method, Field, Constructor, and Modifier class

- Implementation of the reflection concepts

COLLECTION FRAMEWORK

- Introduction of Collection Framework
- Need of Collection
- Collection API (the classes and interfaces)
- The methods of Collection interface
- List Interface (the Array List, Vector, Linked List, and Stack classes)
- The Iterate, ListIterator, and Enumeration interface
- Set Interface (the HashSet, TreeSet, LinkedHashSet classes)
- Map Interface (the HashTable, HashMap, LinkedHashMap, classes)
- The Comparable and Comparator interfaces
- The TreeMap and TreeSet classes
- How Collection Framework is used in industry (In Real Project Development)

JSP & SERVLETS

- Introduction of Collection Framework
- Introduction of Servlet
- Difference b/w CGI and Servlet
- Lifecycle Methods Of Servlet
- Servlet Implementation & Configuration
- ServletRequest and ServletResponse Interface and their method
- SevletConfig and ServletContext Interface and their method
- Introduction of Web server i.e. Glassfish, Tomcat, Weblogic
- Introduction to IDE(Integrated Development Environment) like: Eclipse, NetBeans
- Introduction of JSP

Project 2:

- Implementation of a Web Based project. This project will be the combination of Servlet/JSP (for implementing the web application) and the Java Database Connectivity (for fetching/storing the data from the database). It this project some other technologies like HTML, CSS, Java script, and AJAX will also be discussed

Struts 2.x

- Introduction Of MVC Design Pattern
- Introduction of Sututs2

- Struts2.x Architecture
- Introduction of Component of Struts 2 like: Action, Results & Interceptors
- Heart of Struts2.x i.e. Interceptor
- Working of Param Interceptor
- Working of Model Driven Interceptor
- Working of ServletConfig Interceptor
- Working of ExecAndwait Interceptor
- Working of Validation Interceptor
- Object Graph Navigation Language(OGNL)
- Struts 2 Dynamic Method Invocation
- Struts 2 Tags
- Struts 2 UI Tags
- Struts 2 Control Tags
- Struts 2 Tile Introduction
- Integrating Struts2 and Hibernate

Spring2.x/3.x

- Spring 2.x Overview
- All Modules Of Spring
- Introduction to Inversion Of Control configuration of Spring
- Dependency Injection
- Constructor Injection
- Setter Injection
- Object Creation using Factory Method
- Lifecycle Management Of Objects
- Auto wiring Of Beans using Xml
- Auto Discovery Of Beans using Xml
- Introducing Annotation in Spring
- Auto wiring Of Beans using Annotation
- Introduction to Aspect Oriented Programming
- Using Spring with JDBC
- Use of JDBC Template
- Using Spring with Hibernate
- Use of Hibernate Template
- Using Spring with JNDI
- Introduction to Spring MVC
- Integrating Spring MVC with Hibernate
- Integrating with Struts2

- Integrating with Struts2 and Hibernate

Hibernate3.x

- Introduction of Hibernate Framework
- Introduction of Session Factory & Session Interface
- Scope of Session Factory and Session Interface
- Database Persistence Using Hibernate
- Is-A Mapping
- Single Table Mapping
- Table Per Subclass
- Has-A Mapping
- One to One Mapping
- One to Many Mapping
- Many to many Mapping
- Introduction to HQL
- Importance of HQL
- Difference b/w HQL and SQL
- Implementing HQL
- Introducing More Powerful and Flexible Criteria API
- Introducing Pagination
- Implementing Pagination using HQL and Criteria API
- Invoking Stored Procedure and function of Database using HQL and Criteria API
- Introduction to Caching
- Introducing 1st Level Caching
- Introducing 2nd Level Caching

Project work is mandatory after the completion of the training program.