**Java Course Syllabus**

**Core Java**

**Introduction To Java     – 2 hr**

History of Java

What is Java , Java Flavors, characteristics

JVM Architecture

Bytecode

Class Loader

Unicode

Class path

Path

**Fundamentals of Java Programming – 4 hrs**

Object oriented concepts ( OOP )

Keywords, Datatypes, Variables, Operators, Casting

Selection statement ( if, switch )

Control statements ( while, do while , for )

Conditional statements ( if, else, elseif, ?

static

Arrays

**Object Oriented Programming with Java – 5 hrs**

Classes and Objects

Structure of a class – its internals ( Data Members, methods )

Using static

Constructor

this keyword

modifiers

playing with the object ( copying, casting )

Garbage collection

Abstract class

**Inheritance – 3 hrs**

Basics (extends keyword )

Modifiers and their scope

Deriving a class

super, final keyword

why java does not support multiple inheritance?

**Polymorphism – 2hrs**

overloading a method

overloading a constructor

method overriding

accessing base class method

**Packages and Interfaces – 2hrs**

basics

modifiers and their scope chart

setting classpath

compiling and accessing a packaged class

types of packages

user defined package

**Exploring java.lang package – 2hrs**

String, StringBuffer, Arrays,

Wrapper classes

**Exception Handling – 3 hrs**

Basics

Hierarchy of exceptions

Handling exception – Try, catch, finally, throw, throws

User defined exceptions

**Threads    – 3 hrs**

Basics, Thread class , Runnable Interface

Thread model

Life cycle – start(), run()

Scheduling

Deadlocks / concurrency issues

Synchronization – as a block, as a modifier

Daemon thread

**I/O Streams   – 4 hrs**

Introduction

Hierarchy of streams

IO Stream, Byte Stream, Character Streams

BufferedInputStream, BufferedOutputStream

Reader and Writer class

BufferedReader, PrintWriter

Serialization

**Collection Framework   – 6 hrs**

basics, hierarchy

legacy classes – Vector, Queue, Stack, Enumeration, Dictionary, Properties

List, ArrayList, LinkedList

Set, HashSet, TreeSet,

Map, HashMap, TreeMap,

Generics

Annotations

Boxing / Unboxing

Enums

**Introduction to functional style of programming   – 1 hrs**

**Mini application – discussion / implementation  – 10 hrs**

Tools

Javadoc

javap

jar

IDE Tools

eclipse

myeclipse

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**Spring 15 – 20 days**

**Spring core   – 4 hrs**

Types of containers

Xml configuration

Core annotations

Component – scan

What can be injected into a bean

Understanding  core annotations

**Spring MVC – 6 hrs**

Handler Mapping

Controllers

View resolvers

Validators

interceptors

**Spring DAO – 4 hrs**

Jdbc templates

Exception hierarchy

**Spring ORM – 2 hrs**

Hibernate template

Integration with hibernate

**Spring AOP – 2 hrs**

Point cut

Advisors

Types of advices

**Spring – webservices ( Restful API ) – 3 hrs**

**Spring security – 4 hrs**

**Spring JPA – 2hrs**

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**Hibernate**

**Introduction – 4 hrs**

Introduction to ORM ( Object Relational Management )

Benefits of ORM

Contrast JDBC with ORM

Hibernate Jar files

Hibernate Architecture

SessionFactory , Session, Transaction, Query

Understanding config files .hibernate.xml, .hbm.xml

Performing CRUD operations

load, get, save, saveorupdate, delete

**HQL – 2 hrs**

working with various SQL commands

accessing more than one object from the table

**Mapping – 6 hrs**

Inheritance

Collection

Composition

Association

**Cache – 3 hrs**

Level – I and II

Using third party to configure L2 cache

**Criteria – 3 hrs**

Interfaces / classes

implementation

Note : an application using the above technologies  –

Domains : Telecom , LMS, etc…

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**Spring Boot – 15 – 20 hrs**

Introduction / benefits

Spring Boot overview

Bootstrapping an Boot application –

Initializer

Auto Configuration

Spring Boot annotations

Spring Boot properties

**Spring Boot profiles**

Accessing data with Spring Boot and h2 database

Configuring Spring Boot with spring MVC application

Building a Restful web application with Spring Boot

Highlights of Training

**An application based on Spring boot  – Either migration / new one**

Industry experienced Professional

Hands-on experience with Project orientation

Interview based Questions

Advanced Java Training Syllabus

**Fundamentals – 2 hrs**

Client, Server, Port, Application, Web Server, Application Server, Web Client and Web Application

Installation of Java and Understanding PATH and CLASSPATH

Installation of Eclipse

Installation of Tomcat and structure of Tomcat

Linking any Web Server with Eclipse

Static Resource Access from Tomcat

**Servlets  – 10 hrs**

Servlet Internals and Servlet Programming

What are Servlets and why do we need Servlets?

Servlet Development with Eclipse

– Developing Servlets

– Compiling Servlets

– Deployment and Invoking of Servlets

Purpose of Servlet Mapping and web.xml

Servlet Architecture

– Detailed Architecture of Servlets

– Discussion of GenericServlet, HttpServlet Interfaces

– Programming examples

Servlet Life Cycle

HTTP Internals

Detailed discussion of all parameters of request and response packets

Discussion of HttpServletRequest and HttpServletResponse interfaces

Session Tracking API

– Practical visualization of Http Session objects and Session table

– Session Tracking API

– Session Tracking Programming

Cookies, URL Rewriting and Hidden Form Fields

ServletConfig Object

ServletContext Object

RequestDispatcher Object

**Filters**

– Why do we need filters?

– Filter, FilterChain, FilterConfig interfaces

– Programming examples

Application / Attribute Lifecycle Listeners

Why do we need Lifecycle Listeners?

ServletContext and ServletContext Attribute Listeners

Session and Session Attribute Listeners

Programming examples

**Java Beans  – 2 hrs**

What are Java beans and why do we need Java beans?

Action tags for java beans

Application of Java beans

**MVC Architecture 2 hrs**

Why do we need MVC?

Discussion of pros and cons of Servlets, JSP and JavaBeans

Programming example to illustrate Business logic, Controller logic, Presentation logic and Bean creation

**JDBC  – 6 hrs**

Java Data Base Connectivity ( JDBC ) internals and programming

What is JDBC ? Why do we need JDBC ?

Discussion of JDBC driver types and Driver Manager

Connection object

Statement types and Discussion of each type of Statement Objects

ResultSet Types and Discussion of each type

Stored Procedure Access from java applications

Transaction Programming with JDBC

Savepoint and RowSet

DataSource and Connection Pooling

Batch Updates

JNDI

Explanation on Usage of important Practical Tools

Eclipse

Tomcat

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**Database – Overview – 5 Hours**

**Introduction to MySQL**

MySQL Installation

DDL Commands

DML Commands

Operators

Functions

Constraints

Joins

Views

Indexes

DCL Commands

TCL Commands

MySQL Cursors

Exception Handling

Stored Procedure

Stored Functions

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**MicroServices – Overview – 10 Hours**

Microservices Introduction

Principle and Characteristics

Use cases and Benefits

Challenges

Design standards

Micro Services Communication

Pitfalls

**Note: Every Saturday and Sunday Mock interview.**