Java Full Stack - Course Outline

1 Duration

- 15 Days

2 Outline

Module-1: Java Language Basics (2 day)

- Java Platform Overview
- Language Syntax
- Expression, Statement, Block
- Write "Hello Wolrd" Java Program
- Comments
- Data Types
- Variables
- Strings
- Arrays
- Control Structures - if, if..else, switch...case
- Loops - while, do...while, for, foreach
- Static
- Methods
- Pass by Parameter, Pass by Reference
- Packages

Module-2: Object Oriented Programming with Java (1 day)

- Class
- Object
- Interface
- Abstraction
- Inheritance
- Polymorphism - Static vs Dynamic
- Write object oriented programs with Java

Module-3: Java Collection Framework (1 day)

- Java Collection Framework Overview
- Collection Data Structures - List, Set, Map, Queue
- Working with different Collection implementations and Algorithms
- ArrayList, Vector, LinkedList, HashSet, TreeSet, Hashtable, HashMap, TreeMap

Module-4: Exception Handling and IO (0.5 day)

- Exception vs Error
- Checked vs Unchecked Exception
- try..catch...finally
- throw, throws
- Write custom exception
- Intro to Java I/O
- Reading and Writing data from Console, File using IO and NIO classes

Module-5: Generics and Annotations (0.5 day)

- Generics Overview
- Applying Generics on Collection Framework
- Annotations Overview
- Understanding pre-defined annotations
- Defining custom annotations

Module-6: Multi Threading (1 day)

- Process vs Threads
- Thread Lifecylcle
- Thread creation and execution
- Thread Constructs - wait, notify, notifyall, interrupt, sleep, join, volatile, yield
- Thread Priority
- Daemon threads
- Thread Groups
- ExecutorService APIs

Module-7: Java 8 features (1 day)

- Fundamentals of Functional Programming
- Lambda Expressions
- Functional Interfaces
- Stream API - foreach, map, filter, parallel processing, collectors, etc.
- Method References
- Default Methods
- Optional Class
- New Date/Time API

Module-8: JDBC (1 day)

- Intro to JDBC
- JDBC Architecture
- JDBC drivers
- Connection Object
- Types of statements (Statement, PreparedStatement, CallableStatement)
- Working with JDBC data types
- Transaction Mangement
- Using ResultSet and RowSet Objects
- Creating and executing database queries and processing the results

Module-9: Introduction to Spring Framework (1 days)

- Introduction to Web Technologies
- Overview of Spring framework
- Spring Core - Spring Context, Dependency Injection/IoC, Bean Life Cycle Management, Bean Wiring
- Setting up and configuring development environment - Java, Eclipse/STS and Maven
- Lab exercises to practice Spring Core concepts - DI/IoC, Auto Wiring, etc.

Module-10: Introduction to Spring Boot (1 days)

- Spring Boot Overview
- Create Spring Boot Project
- Spring Boot Features
- Auto-Configuration
- @SpringBootApplication Annotation
- Externalized Configuration
- Profiles, Logging, Packaging
- Spring Boot Sample Application
- Spring Boot Monitoring and Management

Module-11: Introduction to REST (2 days)

- RESTful Webservices Overview
- REST concepts
- SOAP vs REST
- Defining REST API
- WADL Overview
- JAX-RS Overview
- Spring REST Overview
- @Controller, @RestController
- @RequestMapping
- @PathVariable, @QueryVaraible, @MatrixVariable
- @RequestBody, @ResponseBody
- @GET, @POST, @PUT, @DELETE
- Producing/Consuming Text
- Producing/Consuming XML
- Producing/Consuming JSON
- Injecting Path, Query, Form and Header Parameters
- Data Validation
- Session Management
- Working with different Media Types
- Content Negotiation
- Handling Exceptions
- Exception Mapping and Providers
- HATEOAS Maturity Model
- REST Clients - Postman, REST Client API, REST Template
- Create and publish RESTful Web Services
- Build client to consume RESTful Web Services
- Lab exercises to practice RESTful Webservices concepts and Spring Integration

Module-12: Introduction to MySQL / SQL (1 days)

- Introduction to RDBMS
- Introduction to MySQL
- Introduction to SQL - DDL, DML and DCL
- Data Types and Operations
- Database CRUD operations (INSERT, UPDAT, DELETE and SELECT)
- Joins, Sub queries, Aggregations, Grouping

Module-13: Introduction to JDBC, ORM/JPA and Spring Data (2 days)

- Overview of Spring JDBC Template
- Lab exercises to perform CRUD operation using Spring JDBC
- Overview of ORM framework - JPA / Hibernate
- Spring ORM
- Lab exercises to perform CRUD operation using Hibernate / Spring JDBC
- Spring Data Overview
- JPA Repository
- Lab exercises to perform CRUD operation using Spring Data – JPA Repository