**JPMC Coding Academy**

1. Programming Fundamentals - **1 Day**
   1. Pseudo code/Algorithms/Flow Charts
   2. Variables
   3. Decision Constructs
   4. Loops
2. RDBMS Fundamentals USING Oracle- **2 Days**
   1. Architecture of RDBMS
   2. Normalization and database design
   3. Basic SELECT operations
   4. Joins and Unions
   5. Insert, Update and Delete operations
   6. Stored Procedure and Functions

1. UML and modelling: - **1 Day**
   1. Overview of UML
   2. UML diagram types
   3. UML diagrams overview:
      1. Activity, Use-case, Class and Sequence diagrams

Assessment – **1 Day**

MCQ - Test the knowledge acquired foundational concepts

Design Challenge – Test design understanding by giving small scenarios to build UML diagrams

1. Object Oriented Programming with Java - **6 Days**
   1. Introduction to Java and Eclipse
      1. Features of Java
      2. Evolution in Java
      3. Developing software in Java
      4. Installation and Setting up Eclipse
      5. Introduction to Eclipse IDE
      6. Creating and Managing Java Projects
      7. Use of Java docs
   2. Language Fundamentals
      1. Keywords
      2. Primitive Data Types
      3. Operators and Assignments
      4. Variables and Literals
      5. Flow Control: Java’s Control Statements
   3. Classes and Objects
      1. Classes and Objects
      2. Packages
      3. Access Specifiers
      4. Constructors - Default and Parameterized
      5. this reference
      6. using static keyword
   4. Exploring Java Basics
      1. The Object Class
      2. Wrapper Classes
      3. Type casting
      4. Using Scanner Class
      5. String Handling
      6. Date and Time API
   5. OOP with Java
      1. Inheritance
      2. Using super keyword
      3. The instanceOf Operator
      4. Method & Constructor overloading
      5. Method overriding
      6. @Override annotation
      7. Using final keyword
   6. Interfaces and Abstract Classes
      1. Abstract class
      2. Interfaces
      3. default methods
      4. static methods on Interface
      5. Runtime Polymorphism
   7. Exception Handling
      1. Exception Types
      2. Exception Hierarchy
      3. Try-catch-finally
      4. Try-with-resources
      5. Multi catch blocks
      6. Throwing exceptions using throw
      7. Declaring exceptions using throws
      8. User defined Exceptions
   8. Arrays, Collections and Generics
      1. One dimensional array
      2. Multidimensional array
      3. Using varargs
      4. Using Arrays class
      5. Collections Framework
      6. Collection Interfaces
      7. Implementing Classes
      8. Iterating Collections (using foreach & iterator)
      9. Comparable and Comparator
      10. Generics
      11. Writing Generic Classes
      12. Using Generics with Collections
   9. File IO ,Property Files
      1. Overview of I/O Streams
      2. Types of Streams
      3. The Byte-stream  I/O hierarchy
      4. Character Stream Hierarchy
      5. Buffered Stream
      6. The File class
      7. The Path class
      8. Object Stream
      9. Property Files
   10. Annotations
       1. What’s the use of Annotations?
       2. Annotations basics
       3. Built-in Annotations in Java
          * @Override
          * @Deprecated
          * @SuppressWarnings
   11. Java Database Connectivity
       1. JDBC APIs Architecture
       2. Database Access Steps
       3. Calling database procedures
       4. Using Transaction
       5. Connection Pooling
       6. Working with Rowsets
       7. DAO Design Pattern
       8. Security
          1. Injection Flaws
          2. SQL Injection Attacks Evolve
          3. Drill Down on Stored Procedures
          4. Other Forms of Injection
          5. Minimizing Injection Flaws
   12. Logging
       1. Log4J Concepts
       2. Installation of Log4J
       3. Configuring Log4J
   13. Multi Threading and synchronization
       1. Understanding threads
       2. Thread life cycle and Scheduling threads- Priorities , Sleep(),join()
       3. Synchronization
   14. End to end simple case study design
       1. Layered architecture
       2. Java Data Source implementation
       3. Best practices

Assessment – **1 Day**

MCQ - Test the knowledge acquired on Java programming fundamentals

Code Challenge – Test implementation understanding by giving small scenarios to write code

1. Overview of OO Analysis and Design - **1 Day**
   1. Inheritance, Association, Delegation.
   2. OOAD’s SOLID principles
   3. Types of classes
   4. Design patterns
      1. Overview of design patterns?
      2. Creational, Structural and Behavioral patterns
      3. Implementation of Creational patterns.
2. Agile Development – **2 Days**
   1. Overview of Agile
   2. Product Backlog creation
   3. Story writing and Story Mapping
   4. Iterative development
   5. Prioritization and Planning
   6. Agile ceremonies
   7. Continuous Integration
   8. Continuous Delivery
3. Unit Testing using JUnit - **1 Day**
   1. Why testing?
   2. What is Test Driven Development. TDD?
   3. Why use JUnit?
   4. Installing and Running JUnit
   5. Understanding JUnit Framework
   6. Testing with JUnit
   7. Advanced Testing Concepts
   8. Test Suites
   9. Parameterized Tests
   10. Mocking Concepts
   11. Writing test cases for core java case study designed in module 4.

Assessment – **1 Day**

MCQ - Test the knowledge acquired on OOAD, Agile Development and Junit

Code Challenge – Test design and implementation skills using a complex project and do unit testing using Junit

1. Web Concepts – **4 days**
   1. Building Internet fundamentals
      1. Internet architecture
      2. TCP/ IP and HTTP
   2. XML/JSON Fundamentals
      1. XML basics
      2. Namespaces and Schema
      3. XSL
      4. JSON basics
      5. XML Vs JSON
      6. Security
         1. XML Signature
         2. XML Encryption
         3. XKMS
         4. XML Attacks
   3. Responsive Webpage designing
      1. HTML 5
      2. CSS 3
2. Client Side Programming **- 2 Day**
3. Scripting Fundamentals
4. JavaScript Programming, Output, Statement, Code Blocks, Comments, Variables, DataTypes, Objects, Events
5. Object Oriented JavaScript concepts
6. DOM and Event-based processing
7. JQuery: Selection framework, DOM manipulation, AJAX support,
8. JSON parsing
9. Responsive Web Designing with Angular JS 4 **- 4 Days**
   1. TypeScript Introduction
   2. Introduction to Angular 4
   3. Angular Building Blocks: Components, Modules, Decorators
   4. Angular CLI
   5. Databinding
   6. Directives
   7. Pipes
   8. Inheritance
   9. Routing
   10. Services
   11. Angular Forms and Controls

Assessment – **1 Day**

MCQ - Test the knowledge acquired on Web Concepts and Angular 4

Code Challenge – Test UI development and implementation skills using a web project

1. Developing Java EE Application**- 6 Days**
   1. Java EE Core Components
   2. Developing dynamic web application with Servlets and JSP
      1. Introduction to Servlet Technology
      2. Servlet Life Cycle
      3. Request Response Object
      4. Inter-Servlet Communication
      5. Session management and tracking
      6. Filters and Listeners
   3. JSP
      1. Introduction to JSP 2.2
      2. Writing Java Server Page
      3. JSP Scripting Elements
      4. JSP Directives
      5. JSP Actions
      6. EL And JSTL
      7. MVC design with Front Controller
   4. Java EE and DataSource
      1. Configuring Datasource application server
      2. End to end simple case study design using
         1. MVC architecture using Servlet JSP.
   5. Java EE Security
      1. JEE Security Overview
      2. Four Authentication Models
      3. Role Based Security
      4. Declarative Security
      5. Web Authentication - Basic, Form-Based, Digest, HTTPS Client
      6. Using Basic Authentication
      7. Using Form-Based Authentication
      8. Programmatic Security - HttpServletRequest, Retrieving Roles
      9. *-Combining Container-Managed and Programmatic Security*
      10. *-Configuring Servers to Use SSL*
      11. Web Application Encryption
      12. Understand the Role of JAAS in Authentication

Assessment – **1 Day**

MCQ - Test the knowledge acquired on Java EE application

Code Challenge – Test Server-side core services and components implementation skills

1. Object Relational Mapping using JPA – **2 Days**
   * 1. Introduction to ORM And its Need
     2. JPA-A thin layer of ORM over hibernate
     3. The Persistence Life Cycle
     4. CRUD operations
     5. JPA Queries
     6. Association And Mapping
     7. Writing DAO layer using JPA
2. Context and Dependency Injection (CDI) **- 1 Day**
   1. Overview of Component Management Services and Context and Dependency Injection.
   2. The CDI container and context configuration
   3. The Injection Points, their significance and suitable scenarios
   4. The @Inject, @Default, @Alternative, @Name and @Qualifier annotations.
   5. Implementing CDI in standalone and web application
3. Java API for WebSocket **- 1 Day**
4. Introduction to WebSocket
5. Creating WebSocket Applications in the Java EE Platform
6. Programmatic Endpoints
7. Annotated Endpoints
8. Sending and Receiving Messages
9. Maintaining Client State
10. Using Encoders and Decoders
11. Path Parameters
12. Handling Errors
13. Java Bean Validation (JSR 349) **- 1/2 day**
    1. Introduction to Bean validation
    2. Validate Parameters and Return Values
    3. Dependencies
    4. Using Validation Annotation
       1. Standard JSR annotations: - @NotNull, @AssertTrue , @Size , @Min, @Max, @Email
       2. Some additional annotations: **-** @NotEmpty, @NotBlank, @Positive, @PositiveOrZero , @Negative, @NegativeOrZero, @Past, @PastOrPresent, @Future *and* @FutureOrPresent
    5. Programmatic Validation
       1. Defining a Bean
       2. Validating a Bean
14. Spring 4 **– 3 Days**
    1. Fundamentals of Spring Framework
    2. Spring beans
    3. Spring JDBC
    4. Spring MVC
    5. Handler Mapping and Controllers
    6. Spring JPA Integration
    7. Aspect Oriented Programming with Spring

Assessment – **1 Day**

MCQ - Test the knowledge acquired on Spring Framework Components

Code Challenge – Test core services implementation skills using Spring Framework

1. Spring 4 Security for Java EE Web Application – **1 Day**
   * 1. What is Spring 4 Security?
     2. Spring 4 Security Advantages
     3. Spring 4 Security Features
     4. Authentication and Authorization.
     5. Supports BASIC, Digest and Form-Based Authentication.
2. Spring Boot **- 1 Day**
   1. Fundamentals
   2. Convention over configuration
   3. Auto-configuration (class-path scanning)
   4. Dependency management
   5. Dev tools and Actuator
   6. Java Configuration
3. Web Service Essentials and REST**- 2 Days** 
   1. SOA Architecture
   2. Web Service and Interoperability
   3. JAXP, JAXB, JAX – WS
   4. JAX-WS
   5. JAX-RS
   6. Web Service Security Exposures
   7. When Transport-Level Alone is NOT Enough
   8. Message-Level Security
   9. Introduction to WSS (WS-Security)
   10. Overview Java's XWSS API
4. UI testing with Selenium **– 1 and 1/2 days**
   1. Selenium Fundamentals
   2. Writing Tests with Selenium Webdriver
   3. TestNG Framework for Creating Selenium Scripts
5. Behavior Driven Development (BDD) **- 1/2 day**
   1. Introduction to BDD
   2. Features and advantages of BDD
   3. BDD Tools
6. Cucumber**- 1 day**
   1. Cucumber Basics
      1. Feature Files
      2. Feature
      3. Scenario
      4. Scenario Outline
      5. Tags
         1. Example of use of single tags
         2. Example of use of multiple tags
   2. Junit Runner
   3. Cucumber Report
   4. Cucumber Project Setup
      * Example
      * Setup a cucumber – java project
      * Integrate Selenium WebDriver with Cucumber
7. End to end mini project design and implementation – **2 days**
   1. Spring IoC,
   2. Spring Security, Boot
   3. Angular JS 4
   4. Spring-JPA integration
   5. Best practices

Assessment - **1 Day**

MCQ - Test the knowledge acquired on Web Services, Selenium and Cucumber

End to end mini project design and implementation – Final Assessment – **7 Days**

– Test knowledge and skills acquired by asking participants to develop a complete project design and implementation using DevOps Practices. Project Evaluation and Final Presentation to management on Last day