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## JEE with Cloud LOT Course Structure

JEE & Cloud LOT provides exposure to the Java technologies & Cloud. The following table lists the course structure for JEE Cloud LOT.

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Course** | **Duration (In Days)** |
| 1 | Discover (Induction) | 2 |
| 2 | Campus to Corporate | 2 |
| 3 | OOPS & SQL(Oracle) + Core Java 8 and **Developer Tools** | 13 |
| 4 | **Core Java 8 and Developer Tools Test** | **0.5** |
| 5 | **Soft skill Part I** | **0.5** |
| 6 | Web basics (HTML ,CSS, JavaScript and XML) + JQuery | 3 |
| 7 | Angular 6 for JEE & Object Oriented Javascript | 3 |
| 8 | **Web basics, JQuery and Angular 6 Test** | **0.5** |
| 9 | **Soft skill Part II** | **0.5** |
| 10 | Servlets 3.0 & JSP 2.2 | 2 |
| 11 | JPA with Hibernate 3.0 (Basics) | 1 |
| 12 | Build Tool - Maven | 0.5 |
| 13 | Spring 4.0 with Spring Boot and Spring with REST | 6 |
| 14 | Spring 4.0+JPA Test | 0.5 |
| 15 | DevOps/ CI CD concepts (Github /Nexus ,CI with Jenkins, TDD with Junits, Mockito) | 3 |
| 16 | Cloud Basics & AWS Basics of different services | 3 |
| 17 | Micro services Basics & Cloud Native Concepts | 1 |
| 18 | Micro Services Advance using Spring Boot and Rest Template | 2 |
| 19 | NoSQL Basics and MongoDB | 2 |
| 20 | Containers – Introduction to Docker | 2 |
| 21 | **DevOps/ CI CD concepts + AWS services + Micro services Adv. using Spring Boot and Rest Template+ NoSQL Basics and MongoDB + Containers – Introduction to Docker for JEE Test** | **0.5** |
| 22 | **Soft skill Part III** | **0.5** |
| 23 | Mini Project Presentation | 1 |
| 24 | Quality Process Awareness + PLP Presentation | 8 |
| 25 | L1 Preparation + Test | 2 |
| 26 | Total Training Duration | 60 |

**Oracle Basics**

**Program Duration:** 2 days

**Contents:**

* Introduction to Database
  + Getting Started with Database
  + Characteristics of DBMS
  + Data models
  + Relational DBMS
  + Database Administrator
* Basics of SQL
  + The SQL Language
  + Rules for SQL Statements
  + Standard SQL Statement Groups
* Data Query Language
  + The SELECT statement
  + The WHERE clause
  + Comparison, Mathematical, and Logical operators
  + The DISTINCT clause
  + The ORDER BY clause
  + Tips and Tricks in SELECT Statements
* Aggregate (Group) Functions
  + The Group function
  + GROUP BY & HAVING clause
  + Examples of GROUP BY and HAVING clause
  + Tips and Tricks
* SQL (Single-row) functions
  + SQL functions
  + Number functions
  + Character functions
  + Date functions
  + Conversion functions
  + Miscellaneous functions
  + Tips and Tricks
* Joins and Sub-queries
  + Joins
    - Oracle Proprietary Joins
  + Types of Joins
  + Sub-query
* Database Objects
  + Basic Data Types
  + Data Integrity
  + Examples of CREATE TABLE
  + Examples of ALTER TABLE
  + Database Objects(Index, and View)

* Data Manipulation Language
  + Adding Data
  + Removing Data
  + Modifying Data
* Transaction Control Language
  + Introduction to Transactions
  + Transaction Control Statements

**OOP and UML**

**Program Duration:** 1 day.

**Contents:**

* Principles in Object-Oriented technology
* UML diagram
  + Use Case Diagram
  + Class Diagram
  + Sequence Diagram

**Core Java 8 and Developer Tools**

**Program Duration**: 10 days

**Contents**:

* Introduction to Java
  + Introduction to Java
  + Features of Java
  + Evolution in Java
  + Developing software in Java
* Eclipse 4.4 (Luna) as an IDE
  + Installation and Setting up Eclipse
  + Introduction to Eclipse IDE
  + Creating and Managing Java Projects
  + Use of Java docs
  + Miscellaneous  Options
* Language Fundamentals
  + Keywords
  + Primitive Data Types
  + Operators and Assignments
  + Variables and Literals
  + Flow Control: Java’s Control Statements
  + Best Practices
* Classes and Objects
  + Classes and Objects
  + Packages
  + Access Specifiers
  + Constructors - Default and Parameterized
  + this reference
  + using static keyword
  + Best Practices
* Exploring Java Basics
  + The Object Class
  + Wrapper Classes
  + Type casting
  + Using Scanner Class
  + String Handling
  + Date and Time API
  + Best Practices
* Inheritance and Polymorphism
  + Inheritance
  + Using super keyword
  + InstanceOf Operator
  + Method & Constructor overloading
  + Method overriding
  + @override annotation
  + Using final keyword
  + Best Practices
* Abstract Classes and Interfaces
  + Abstract class
  + Interfaces
  + default methods
  + static methods on Interface
  + Runtime Polymorphism
  + Best Practices
* Regular Expressions
  + Regular Expressions
  + Validating data
  + Best Practices
* Exception Handling
  + Introduction
  + Exception Types
  + Exception Hierarchy
  + Try-catch-finally
  + Try-with-resources
  + Multi catch blocks
  + Throwing exceptions using throw
  + Declaring exceptions using throws
  + User defined Exceptions
  + Best Practices
* Array
* One dimensional array
* Multidimensional array
* Using varargs
* Using Arrays class
* Best Practices
* Collection
  + Collections Framework
  + Collection Interfaces
  + Implementing Classes
  + Iterating Collections (using foreach & iterator)
  + Comparable and Comparator
  + Best Practices
* Generics
  + Generics
  + Writing Generic Classes
  + Using Generics with Collections
  + Best Practices
* File IO
  + Overview of I/O Streams
  + Types of Streams
  + The Byte-stream  I/O hierarchy
  + Character Stream Hierarchy
  + Buffered Stream
  + The File class
  + The Path class
  + Object Stream
  + Best Practices
* Property Files
  + What are Property Files?
  + Types of Property files
  + User defined Properties
* Introduction to Junit 4
  + Introduction to Junit 4
  + Why testing
  + Why use Junit
  + Installing and Running Junit
  + Understanding Junit Framework
  + Testing with JUnit
* Java Database Connectivity
  + Java Database Connectivity - Introduction
  + Database Connectivity Architecture
  + JDBC APIs
  + Database Access Steps
  + Calling database procedures
  + Using Transaction
  + Connection Pooling
  + DAO Design Pattern
  + Best Practices
* Introduction to Layered Architecture
* Logging with Log4J
  + Log4J Concepts
  + Installation of Log4J
  + Configuring Log4J
  + Best Practices
* MultiThreading
  + Understanding threads
  + Thread life cycle and Scheduling threads- Priorities , sleep(),join()
  + Consumer Producer problem
  + Inter Thread communication : wait, notify, notifyAll methods
  + Synchronization concept
* Lambda expressions
  + Understand the concept of Lambda expressions
  + Working with lambda expressions
  + Use method references and functional interfaces
* Stream API
  + Understand the concept of Stream API
  + Use stream API with collections
  + Perform different stream operations

**Web Basics (HTML5, CSS-3,JavaScript, XML,JQuery)**

**Program Duration: 3 days.**

**Contents: HTML**

* HTML Basics
  + Understand the structure of an HTML page.
  + New Semantic Elements in HTML 5
  + Learn to apply physical/logical character effects.
  + Learn to manage document spacing.
* Tables
  + Understand the structure of an HTML table.
  + Learn to control table format like cell spanning, cell spacing, border
* List
  + Numbered List
  + Bulleted List
* Working with Links
  + Understand the working of hyperlinks in web pages.
  + Learn to create hyperlinks in web pages.
  + Add hyperlinks to list items and table contents.
* Image Handling
  + Understand the role of images in web pages
  + Learn to add images to web pages
  + Learn to use images as hyperlinks
* Frames
  + Understand the need for frames in web pages.
  + Learn to create and work with frames.
* HTML Forms for User Input
  + Understand the role of forms in web pages
  + Understand various HTML elements used in forms.
  + Single line text field
  + Text area
  + Check box
  + Radio buttons
  + Password fields
  + Pull-down menus
  + File selector dialog box
* New Form Elements
  + Understand the new HTML form elements such as date, number, range, email, search and datalist
  + Understand audio, video, article tags

**Contents: CSS3**

* Introduction to Cascading Style Sheets 3.0
  + What CSS can do
  + CSS Syntax
  + Types of CSS
* Working with Text and Fonts
  + Text Formatting
  + Text Effects
  + Fonts
* CSS Selectors
  + Type Selector
  + Universal Selector
  + ID Selector
  + Class selector
* Colors and Borders
  + Background
  + Multiple Background
  + Colors RGB and RGBA
  + HSL and HSLA
  + Borders
  + Rounded Corners
  + Applying Shadows in border

**Contents: Javascript**

* JavaScript Language
  + Data Types and Variables
  + JavaScript Operators
  + Control Structures and Loops
  + JavaScript Functions
* Working with Predefined Core Objects
  + Data Types in JavaScript
  + String Objects
  + URL String Encoding and Decoding
  + Math Properties
  + Math Objects
  + Date Objects
  + Date and Time Arithmetic
* Working with arrays
  + Arrays object, its properties and methods
* Document Object Model
  + Understand the JavaScript Object Model
  + Understand the Window object
* Working With Document Object
  + Document Object and its properties, methods and events
* Working with Form Object
  + Form Object Properties, Methods & Event Handlers
  + Text-Related Objects
  + Button Objects
  + Check Box and Radio Objects
  + Select Objects
  + Validate Data and Form Submission

**Contents: XML**

* Introduction to XML
  + Evolution of XML
  + Role of XML in Web Applications
  + Different members of XML family
  + Introduction to Namespace
* Anatomy of an XML Document
  + Logical and Physical structure of XML file
  + Parts of XML file like Elements, Attributes , Entities and Processing instructions
* XML Schema Definition
  + Advantages of Schema
  + Method to write a schema definition for an XML file
  + Data types used in schemas
  + Simple and Complex type of elements
  + Indicator – Order, Occurrence, and Group
  + Restrictions on XSD elements

**Contents: JQuery**

* jQuery Fundamentals
  + jQuery Introduction
  + Why jQuery?
  + About jQuery.com
  + Using jQuery
  + Content Delivery Network (CDN)
* jQuery Selectors
  + Introduction to Selectors
  + Id Selector
  + Class Selector
  + Tag Selector
  + Attribute Selector
  + Form Element Selectors
  + Using Filters in Selector
* Working with JSON
  + JSON Introduction
  + JSON Types
  + Working with JSON Object
  + Using JSON in jQuery
  + jQuery DOM Manipulation
  + Iterating Through Nodes
  + Working with Attributes and DOM Content
  + DOM Insertion and Removal
  + Working with Classes
* Handling Events
  + Introduction
  + jQuery Event Model Benefits
  + Attach and detach Events from DOM Elements
  + Triggering Events
  + Passing data through events

**Angular 6.0 for JEE**

**Program Duration**: 3 days

**Contents:**

* ES6 & Typescript
  + Var, Let and Const keyword
  + Arrow functions, default arguments
  + Template Strings, String methods
  + Object de-structuring
  + Spread and Rest operator
  + Typescript Fundamentals
  + Types & type assertions, Creating custom object types, function types
  + Typescript OOPS - Classes, Interfaces, Constructor, etc
* Introduction to Angular Framework
  + Introduction to Angular Framework, History & Overview
  + Environment Setup, Angular CLI, Installing Angular CLI
  + NPM commands & package.json
  + Bootstrapping Angular App, Components, AppModule
  + Project Setup, Editor Environments
  + First Angular App & Directory Structure
  + Angular Fundamentals, Building Blocks
  + MetaData
* Essentials of Angular
  + Component Basics
  + Setting up the templates
  + Creating Components using CLI
  + Nesting Components
  + Data Binding - Property & Event Binding, String Interpolation, Style binding
  + Two-way data binding
  + Input Properties, Output Properties, Passing Event Data
* Templates, Styles & Directives
  + Template, Styles, View Encapsulation, adding bootstrap to angular app
  + Built-in Directives, Creating Attribute Directive
* Pipes, Services & Dependency Injection
  + In-built Pipes, Creating a Custom Pipes
  + Services & Dependency Injections
  + Creating Data Service
* Template-Driven Forms
  + Template-Driven Forms
  + Understanding Form State
  + Built-in Validators & Using HTML5 Validation
  + Grouping Form Controls
  + FormGroup, FormControl, FormBuilder
* Http Requests / Observables
  + HTTP Requests
  + Sending GET Requests
  + Sending a PUT Request
  + Using the Returned Data
  + Catching Http Errors
  + Basics of Observables & Promises

**Servlets 3.0 and JSP 2.2**

**Program Duration**: 2 days.

**Contents:**

* Java Web Applications
  + Web Applications – An Overview
  + Web Components
  + JEE Containers
* Working with WildFly 8.x
  + Configuring the Server with Eclipse Luna (4.4.x)
  + Understanding the Directory Structure
  + Deploying the Web Application on WildFly
* Introduction to Servlets API and Ease of Development through Annotations
  + Introduction to Servlet
  + Role of Servlets in Web Application Design
  + Advantages of Servlets
  + Basic Servlet Architecture: Servlet Container
  + Servlet Lifecycle
  + Ease of Developing Servlets through Annotations
  + Retrieving Information from HTML Page
* Request Object
  + Processing Get and Post Requests from Web Clients
  + Request Dispatcher
* Session Tracking
  + Introduction and Need for Session Tracking
  + Different Techniques for Session Management
  + Examples and Best Practices
* Writing Java Server Page
  + Developing a Simple Java Server Page
* JSP Scripting Elements
  + Forms of Scripting Elements
  + Predefined Variables
  + Examples using Scripting Elements
* JSP Directives
  + Page directive
  + Include directive
* JSP Actions
  + jsp:include Action
  + jsp:forward Action
* JSP Standard Template Library (JSTL)
  + What is JSTL?
  + Installing JSTL
  + Using the Expression Language
  + Using JSTL

**JPA With Hibernate 3.0**

**Program Duration:** 1 day

**Contents:**

* Introduction to ORM and its need
* The Persistence Life Cycle
* Java persistence API (JPA)
* JPQL

**Build Tool Maven**

**Program Duration: 0.5 day**

**Contents:**

* Maven
  + Maven Overview
  + Benefits of Maven
  + Maven Basics
  + Working with Maven
  + Installing Maven
  + Creating simple project using Maven Commands
  + Setting up Maven in Eclipse
  + Creating Web application using Maven

**Spring 4.0 with Spring Boot and Spring with REST**

**Program Duration:** 6 days

**Contents:**

* Introduction to Spring Platform and environment
* Introduction to Spring Framework, IoC
  + What is Spring Framework, Benefits of Spring
  + The Spring architecture
  + IOC – Inversion of control, wiring beans
  + Bean containers, lifecycle of beans in containers
  + Customizing beans with BeanPostProcessors & BeanFactoryPostProcessors
  + XML and Annotation-based, mixed configurations
* Java Base Configuration
* Spring MVC framework
  + Introduction: DispatcherServlet, Handler mappings, Resolving views
  + Annotation-based controller configuration
  + Web Based Application Using Spring Boot
  + Introduction to REST web Services
  + REST Controllers on the top of MVC
  + Spring Boot Integration with Rest
* Spring JPA Integration
  + Spring support for JPA
  + Implementing Spring JPA integration
  + Spring Data
  + Spring Boot(Annotation based and Java configuration)
  + Spring ReST
  + Spring DATA ReST

**DevOps/ CI CD concepts (Github/Nexus ,CI Jenkins, TDD with Junits,Mockito)**

**Program Duration**: 3 days.

**Contents**:

* Introduction to DevOps :
  + What is DevOps
  + Evolution of DevOps
  + Agile Methodology
  + Why DevOps
  + Agile vs DevOps
  + DevOps Principles
  + DevOps Lifecycle
  + DevOps Tools
  + Benefits of DevOps
  + Continuous Integration and Delivery pipeline
  + Use-case walkthrough
* GitHub
  + What is DevOps
  + Introduction to Git
  + Version control
  + Repositories and Branches
  + Working Locally with GIT
  + Working Remotely with GIT
* Jenkins
  + Introduction to CI
  + Jenkins Introduction
  + Creating Job in Jenkins
  + Adding plugin in Jenkins
  + Creating Job with Maven & Git
* Jenkins With TDD(Junit testing)
  + Integration of jUnit testing with Jenkins
* Mockito
  + Testing with Mock object
  + Using the Mockito API
  + Integration with Jenkin

**Cloud Basics & AWS Basics of different services**

**Program Duration:** 3 days

**Contents:**

* Cloud Basics
* What is and Why Cloud?
* Why Cloud Computing
* Key characteristics of Cloud
* Cloud Computing Architecture
* Cloud Deployment and Service Model Selection criteria
* Cloud APIs
* Cloud benefits and Challenges
* Different Cloud implementer
* Latest trend
* AWS Basics of different services
* AWS history
* Cloud Computing and Amazon Web Services
* Functionality offered by AWS
* The Differences that Distinguish AWS
* Features of AWS service
* Different AWS web services in Cloud
* AWS global infrastructure
* Compute services
  + Amazon EC2
  + Elastic Load balancing
* Net Working Services
  + Amazon VPC
  + Amazon Route 53
  + AWS Direct connect
  + Amazon CloudFront
* Storage Services
  + Amazon EBS
  + Amzon S3
  + Amazon Glacier
  + AWS Storage gateway
* Database services
  + Amazon RDS
  + Amazon ElastiCache
  + Amazon Dynamo DB
* Analytics services
  + Amazon Elastic Map Reduce
  + Amazon Red shift
  + AWS Data Pipeline
  + Amazon CloudSearch
* Deployment & Management service
  + Amazon Elastic Bean stalk
  + AWS CloudFormation
  + Amazon Cloudwatch
  + Codebuild
  + CodeDeploy
* Administration Services
* AWS IAM

**Microservices Basics & Cloud Native Concepts**

**Program Duration:** 1 day

**Contents**

* Microservices Basics
* Introduction to Micro services
* Monolithic Architecture
* Micro service Architecture
* Benefits of Micro services
* Drawbacks of Micro service
* Cloud Native Concepts
* Cloud technology
* Cloud Native Approach
* Purpose of Cloud Native
* What are Cloud Native companies doing differently to improve IT agility
* Benefits of Cloud native

**Microservices Advanced using Spring Boot and RestTemplate**

**Program Duration:** 2 days

**Contents:**

* **Micro services Intro**
* Monolith Service
* Why Micro Service
* Micro services Pros and Cons
* Challenges in Micro Service
* **Spring Boot Application**
* Introduction to Spring Framework
* Introduction to Spring Boot
* difference between Spring Core and Spring Boot
* Spring Boot enable Cloud Native
* Introduction to Spring Rest Template / Asyc
* How to implement client-side load balancing with Ribbon
* How to implement a Naming Server (Eureka Naming Server)
* How to connect the micro services with the Naming Server and Ribbon
* **Code Walkthrough**
* Introduction

**NoSQL Basics and MongoDB**

**Program Duration:** 2 days

**Contents**

* NoSQL basics
* Evaluation of NoSQL
* Why NoSQL
* Pros and Cons of NoSQL Databases
* NoSQL Vs Relational DB
* Data store types
* Different NoSQL DBMS
* Introduction to Mongo DB
* Why MongoDB
* When not to use
* Documents, Collections and Databases
* Setting up MongoDB
* Starting and Stopping MongoDB server
* Setting up MongoDB
* Starting and Stopping MongoDB server
* Creating and dropping database
* Creating and dropping collections
* DataTypes
* Using MongoDB Shell
* Creating, Updating, Deleting and Querying Documents
* Inserting and Saving Documents
* Removing Documents
* Updating Documents
* Using Modifiers ($inc, $set,$push,$pop,..)
* Query documents
* Query Documents-Query Criteria
* Query Documents-Cursors
* Query Documents-Cursors(Limits, Skips, and Sorts)
* Aggregation
* Projection using MongoTemplate in Spring
* The Aggregation Framework
* Pipeline Operations
* Pipeline Operations- $project
* Pipeline Operations- $group
* Pipeline Operations- $unwind
* Pipeline Operations- $sort
* Pipeline Operations- $limit, $skip

**Containers – Introduction to Docker**

**Program Duration:** 2 days

**Contents**

* Introduction to Docker
* Limitation of VM
* Introduction to Container
* Container Vs VM
* What is Docker
* Docker Community
* Docker Architecture
* Docker Installation
* Docker Platform overview
* Docker Platform
* Docker Engine
* Docker Images
* Docker containers
* Registry
* Repositories
* Docker Hub
* Introduction to images and Reopository naming , Automated build, Private distribution
* Docker Demo
* Docker Example
* Docker Case study

**Quality Process Awareness**

**Program Duration**: 0.5 day.

**Contents**:

* Understand the following :
  + Quality – What and Why
  + Introduction to Quality Management System
  + QMS support to Software Methodology
  + Metrics
  + Defect Prevention

**Pseudo Live Project (PLP)**

**Program Duration**: 7.5 days.

**Contents**:

* Pseudo Live Project (PLP) program is primarily to handhold participants who are fresh into the IT stream & newly recruited from college.PLP project is executed to orient the trainees towards Quality processes followed in the organization. Participants have to understand the value & usage of the various forms, templates & review mechanisms. In PLP, more importance given to “Process Adherence”
* The following SDLC activities are carried out during PLP
  + Requirement Analysis
  + Design ( High Level Design and Low Level Design)
  + Design of UTP(Unit Test Plan) with test cases
  + Coding
  + Code Review
  + Configuration Management
  + Testing
  + Deployment
  + Final Presentation