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## JEE LoT Course Structure

JEE LoT provides exposure to the entire spectrum of Java technologies starting from Core Java to Spring. It focuses on Web Application development using JEE Technology. The following table lists the course structure for JEE LoT.

|  |  |  |
| --- | --- | --- |
| **Sr. No.** | **Course** | **Duration (In Days)** |
| 1 | Discover (Induction) | 2 |
| 2 | Campus to Corporate | 2 |
| 3 | Programming Foundation with Pseudo code | 3 |
| 4 | Oracle Basics | 4 |
| 5 | OOP & UML | 1.5 |
| 6 | Web Basics (HTML 5, CSS 3, JavaScript, XML) | 4.5 |
| 7 | **Programming Foundation with Pseudo code + Oracle for Developers + Web Basics + OOP & UML Test** | 1 |
| 8 | Core Java 8 & Development Tools | 10 |
| 9 | **Core Java 8 + Development Tools Test** | 1 |
| 10 | Introduction to Software Engineering | 0.5 |
| 11 | Servlets 3.0 | 3.5 |
| 12 | JSP 2.2 | 2 |
| 13 | Developer Workbench (PMD, Maven) | 1 |
| 14 | **Servlets 3.0 + JSP 2.2 + Developer Workbench Test** | 1 |
| 15 | JPA with Hibernate 3.0 | 2 |
| 16 | Introduction to Web services (SOAP & REST) | 1 |
| 17 | Basic Spring 4.0 | 5 |
| 18 | Introduction to jQuery | 1 |
| 19 | Angular JS for JEE | 2 |
| 20 | **JPA with Hibernate 3.0 + Introduction to Web services + Basic Spring 4.0+Introduction to jQuery + Angular JS for JEE Test** | 1 |
| 21 | Mini Project presentation | 1 |
| 22 | **Quality Process Awareness + PLP + PLP Presentation** | 8 |
| 23 | **L1 Preparation + Test** | 2 |
|  | **Total Training Duration** | **60** |

**JEE Curriculum**

**Programming foundation with Pseudocode**

**Program Duration:** 3 days.

**Contents:**

* Introduction to program development with Pseudocode
  + Introduction to Programs
  + Types of projects
  + SDLC process of waterfall model
  + Analyze the requirement
  + Introduction to Pseudocode
  + Usage of variables and operators
  + Introduction to control constructs
  + Introduction to arrays
* Good Programming Practices
  + Characteristics of a good program
  + Readable
  + Maintainable
  + Modular
  + Coupling
  + Cohesion
  + Robust Program
  + Difference between correctness and robustness
* Algorithm Analysis and Design
* Sorting and Searching Techniques
  + Sorting and Searching Techniques
  + Sorting algorithms
    - Bubble Sort
    - Insertion Sort
  + Searching Algorithms
    - Sequential Search
    - Binary Search
* Exception Handling 
  + What is exception handling?
  + Case study
  + Defensive Programming
* Software Reviews and Testing
  + What is software testing?
  + What is Debugging?
  + Software Testing Principles
  + TestCase
  + Exhaustive Testing and Economics of Testing
  + Testing Techniques
    - Static Testing
    - Dynamic Testing
  + Static Testing
    - Self-Review
    - Peer Review
    - Group Review
  + Dynamic Testing
    - Blackbox Testing
    - WhiteBox Test
  + Testing Approaches

**Oracle Basics**

**Program Duration:** 4 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
    - SQL: 1999 Compliant Joins
  + Types of Joins
  + Sub-query
* Database Objects
  + Basic Data Types
  + Data Integrity
  + Examples of CREATE TABLE
  + Examples of ALTER TABLE
  + Database Objects(Index, Synonym, Sequence and View)
  + Deleting Database Objects
* Data Manipulation Language
  + Adding Data
  + Removing Data
  + Modifying Data
* Transaction Control Language
  + Introduction to Transactions
  + Statement Execution and Transaction Control
* PL/SQL Basics
  + Introduction to PL/SQL
  + PL/SQL Block Structure
  + Scope and Visibility of Variables
  + SQL in PL/SQL
* Introduction to Cursors
  + Introduction to Cursors
  + Implicit Cursors
  + Explicit Cursors
  + Cursor with Parameters
* Exception Handling
  + Error Handling (Exception Handling)
  + Predefined Exception
  + User Defined Exceptions
  + OTHERS Exception Handler
* Procedures, Functions
  + Subprograms in PL/SQL
  + Anonymous Blocks versus Stored Subprograms
  + Procedures
  + Functions

**OOP and UML**

**Program Duration:** 1.5 days.

**Contents:**

* Introduction to Object-Oriented technology
  + Object Oriented concepts
  + What is Object-Oriented Programming?
  + Why Object-Oriented Programming?
* Objects and Classes
  + What is an Object?
  + What is a Class?
* Principles in Object-Oriented technology
  + Object-Oriented Principles like Abstraction, Encapsulation, Modularity, Hierarchy and Polymorphism
* Some more concepts in OOP
  + Static Members
  + Abstract Class
  + Interface
  + Packages
* Introducing UML
  + Principles of Modeling
  + What is UML? What UML is NOT?
  + UML Building Blocks
  + UML Diagrams
* Dynamic View Diagrams
  + Use Case Diagrams
  + Activity Diagrams
  + Sequence Diagrams
* Static View Diagrams
  + Class Diagrams
* Some more Dynamic View Diagrams
  + State Chart Diagram
  + General & Extension mechanisms

**Web Basics (HTML5, css3, JavaScript, XML)**

**Program Duration:** 4.5 days.

**Contents:**

* Introduction to the Internet
  + Understand the history of Internet.
  + Understand Web terminology.
  + Understand IP addresses
  + TCP/IP Protocol
  + Domain Name System
  + HTTP Protocol
  + Servers – Web Servers
  + Web Browsers
  + Working of WWW
  + HTML – Static and Dynamic Web Pages
* 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
* 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
* Introduction to JavaScript
  + Basic Concepts of JavaScript
  + Embedding JavaScript in HTML
* 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, Frame and Navigator Object
  + Location and History Object
* Working With Document Object
  + Document Object and its properties, methods and events
  + Link ,Anchor & Cookies object
* 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
* Work with Regular Expressions
  + Search using simple patterns
  + Use regular expressions
  + Search using special characters
  + Work with RegExp objects
* 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

**Core Java 8 and Development 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
  + Why testing?
  + Why use JUnit?
  + Installing and Running JUnit
  + Understanding JUnit Framework
  + Testing with JUnit
  + Advanced Testing Concepts
  + Advanced Testing concepts
  + Test Suites
  + Parameterized Tests
  + Mocking Concepts
* 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
  + Introduction
  + Testing DAO Classes
  + Testing Exceptions
  + Best practices
* Logging with Log4J
  + Log4J Concepts
  + Installation of Log4J
  + Configuring Log4J
  + Best Practices
* Muliti Threading
  + Understanding threads
  + Thread life cycle and Scheduling threads- Priorities , Sleep(),join()
* Lambda Expressions
  + Introduction
  + Writing Lambda Expressions
  + Functional Interfaces
  + Types of Functional Interfaces
  + Method reference
* Stream API
  + Introduction
  + Stream API with Collections
  + Stream Operations

**Introduction to Software Engineering**

**Program Duration**: 0.5 day.

**Contents**:

* To Understand the following :
  + What is Software Engineering (SE)
  + Common life cycle models
  + Phases in SE
  + Familiarizing Requirements Phase
  + Familiarizing Design Phase
  + Familiarizing Construction Phase
  + Familiarizing Testing and acceptance Phase
  + Review and Configuration Management Process

**Servlets 3.0**

**Program Duration**: 3.5 day.

**Contents:**

* Java Web Applications
  + Introduction to Layered Architecture
  + 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
  + Servlet Configuration and Accessing Initial Parameters via Annotations
  + Retrieving Information from HTML Page
* Request Object
  + Processing Get and Post Requests from Web Clients
  + Retrieving Path Information
  + Request Headers
* Response Object
  + Structure of a Response
  + Working with Response Headers
* Inter-Servlet Communication
  + Introduction and Need for Inter-Servlet Communication
  + Server / Client Side Dispatch
  + Communication and Sharing Data between Servlets
* Configuring Databases in WildFly
  + Connection Pool with respect to Server
  + Creating a Datasource with WildFly and accessing via Annotation
* Session Tracking
  + Introduction and Need for Session Tracking
  + Different Techniques for Session Management
  + Examples and Best Practices
* Multipart File Upload
  + Introduction to Multipart File Upload
  + Use of Multipart Config in Servlets
* Servlet Filters
  + Introduction and Need of Servlet Filters
  + Filter Lifecycle and Configuration
  + Ease of Development through Annotations

**JSP 2.2**

**Program Duration:** 2 days.

**Contents:**

* Introduction to JSP 2.2
  + Introduction to JSP 2.2
  + Features of JSP pages
  + Access Models
  + Advantages of JSP over competing Technologies
* Writing Java Server Page
  + Developing a Simple Java Server Page
  + JSP Processing Model
  + Comments and Character Quoting Conventions
* 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
  + Java Beans
  + Bean Related Actions
* JSP – Config
  + Jsp-config tag in web.xml
  + Jsp-property-group configuration
* JSP Standard Template Library (JSTL)
  + What is JSTL?
  + Installing JSTL
  + Using the Expression Language
  + Using JSTL

**Developer Workbench(PMD,Maven)**

**Program Duration:** 1 day

**Contents:**

* PMD
  + What is PMD?
  + PMD Rule Sets
  + PMD Usage
  + Integration with IDE
  + PMD in Action
  + Customizing PMD
* 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

**JPA with Hibernate 3.0**

**Program Duration:** 2 days

**Contents:**

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

**Introduction to Web Services (SOAP & REST)**

**Program Duration:** 1 day

**Contents:**

* Introduction to Web Services
  + What are Web Services?
  + Overview of JAX-WS and JAX-RS
  + HTTP and SOAP Messages
* Working with JAX-WS
  + Creating JAX-WS web service
  + Consuming web service
* Working with JAX-RS
  + What is REST?
  + JAX-RS Annotations
  + Creating JAX-RS web service
  + Consuming Restful service

**Basic Spring 4.0**

**Program Duration:** 5 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
* SpEL (Spring Expression Language)
  + SpEL Expression fundamentals
  + Expression Language features
  + Reduce configuration with @Value
* Spring MVC framework
  + Introduction: DispatcherServlet, Handler mappings, Resolving views
  + Annotation-based controller configuration
  + Introduction to REST web Services
  + REST Controllers on the top of MVC
* Spring JPA Integration
  + Spring support for JPA
  + Implementing Spring JPA integration
  + Spring Data JPA
* **AOP (Aspect Oriented Programming)**
  + AOP concepts
  + AOP support in Spring using @AspectJ support
  + AOP support in Spring using Schema-based AOP support

**Introduction to jQuery**

**Program Duration:** 1 day

**Contents:**

* 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 JS for JEE**

**Program Duration**: 2 days

**Contents**:

* Introduction to AngularJS
  + AngularJS Introduction
  + Angular Expression
  + AngularJS - Model, View and Controllers Overview
  + AngularJS Controller and Scope
  + AngularJS Model
  + AngularJS View and Templates
  + AngularJS Modules
  + $rootScope
  + How Angular uses injector Service
  + Config and Run Method
  + jqLite
  + How AngularJs Works
* AngularJS Directives
  + Directives Introduction
  + Built-In Directives
  + Creating Custom Directives
  + Digest Cycle Overview
* AngularJS Filters
  + Introduction to filters
  + Built-In Filters
  + Creating Custom filters
* AngularJS Services
  + Service Introduction
  + Built-In Services
    - $q Service
    - $http Service
* AngularJS Routing
  + Routing Introduction
  + $routeProvider
* Develop Angular UI web with Java middle ware application

**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