

## Java EJB JSF

**Duration:54 Days**

### Table of Content

Topics	Duration (in Days)
Core Java	10
GIT	1
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<b>Total Duration</b>	<b>54</b>

### Core Java

#### Day 1

#### Core Java 8

- Introduction to Java
  - Introduction to Java
  - Features of Java
  - Evolution in Java
  - Developing software in Java
  - **JIT Compiler**
  - **Compiling and Execution procedure of java application**
  - **How to type java program in notepad**
  - **Compile and Execute java program using javac and java commands at command prompt**
  - **Deep study about bytecode**
  - **How it will interpret at runtime**
  - **Command line arguments using java at command prompt**

- 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
  
- **Flow Control, Exceptions**
  - if and switch Statements
  - if-else Branching
  - switch Statements
  - Loops and Iterators
  - Using while Loops
  - Using do Loops
  - Using for Loops
  - Using break and continue
  - Unlabeled Statements
  - Labeled Statements

## Day 2

- Classes and Objects
  - Classes and Objects
  - Packages
  - Access Specifiers
  - Constructors - Default and Parameterized
  - this reference
  - using static keyword
  - Best Practices
  
- **Object Orientation**
  - Encapsulation
  - Inheritance, Is-A, Has-A
  - Polymorphism

- Overridden Methods
- Overloaded Methods
- Reference Variable Casting
- Implementing an Interface
- Legal Return Types
- Return Type Declarations
- Returning a Value
- Constructors and Instantiation
- Default Constructor
- Overloaded Constructors
- Statics
- Static Variables and Methods
- Coupling and Cohesion

### Day 3

- Exploring Java Basics
  - The Object Class
  - Type casting
  
- **Declarations and Access Control**
  - Identifiers & JavaBeans
  - Legal Identifiers
  - Sun's Java Code Conventions
  - JavaBeans Standards
  - Declare Classes
  - Source File Declaration Rules
  - Class Declarations and Modifiers
  - Concrete Subclass
  - Abstract class
  - Declaring an Interface
  - Declaring Interface Constants
  - Declare Class Members
  - Diamond problem
  - Access Modifiers
  - Nonaccess Member Modifiers
  - Constructor Declarations
  - Variable Declarations
  - Garbage Collection
  - Overview of Memory Management and Garbage Collection
  - Overview of Java's Garbage Collector
  - Writing Code That Explicitly Makes Objects Eligible for Garbage Collection
  - Declaring Enums

\*\*\* MCQ exams 2 and One Real life project which implements oops features \*\*\*

## Day 4

- **Operators**
  - Java Operators
  - Assignment Operators
  - Relational Operators
  - Instanceof Comparison
  - Arithmetic Operators
  - Conditional Operator
  - Logical Operators

## Day 5

- **Handling Exceptions**
  - Catching an Exception Using try and catch
  - Using finally
  - Propagating Uncaught Exceptions
  - Defining Exceptions
  - Exception Hierarchy
  - Handling an Entire Class Hierarchy of Exceptions
  - Exception Matching
  - Exception Declaration and the Public Interface
  - Rethrowing the Same Exception
  - Common Exceptions and Errors
- **Regular Expression**
  - Introduction Regular Expressions
  - The java.util.regex package – Pattern & Matcher class
  - Input validation with Regular Expression

## Day 6

- **Generics and Collections**
  - Overriding hashCode() and equals()
  - Overriding equals()
  - Overriding hashCode()
  - Collections
  - So What Do You Do with a Collection?
  - List Interface
  - Set Interface
  - Map Interface
  - Queue Interface
  - Using the Collections Framework
  - ArrayList Basics
  - Autoboxing with Collections
  - Sorting Collections and Arrays
  - Navigating (Searching) TreeSets and TreeMaps
  - Other Navigation Methods

- Backed Collections
- Generic Types
- Generics and Legacy Code
- Mixing Generic and Non-generic Collections
- Polymorphism and Generics

\*\*\* MCQ Exams 3 and end to end 2 projects w.r.t. specified features \*\*\*

## Day 7

- **Strings, I/O, Formatting, and Parsing**
  - String, StringBuilder, and StringBuffer
  - The String Class
  - Important Facts About Strings and Memory
  - Important Methods in the String Class
  - The StringBuffer and StringBuilder Classes
  - Important Methods in the StringBuffer and StringBuilder Classes
  - File Navigation and I/O
  - Types of Streams
  - The Byte-stream I/O hierarchy
  - Character Stream Hierarchy
  - RandomAccessFile class
  - The java.io.Console Class
  - Serialization
  - Dates, Numbers, and Currency
  - Working with Dates, Numbers, and Currencies
  - Parsing, Tokenizing, and Formatting
  - Locating Data via Pattern Matching
  - Tokenizing

## Day 8

- **Threads**
  - Defining, Instantiating, and Starting Threads
  - Defining a Thread
  - Instantiating a Thread
  - Starting a Thread
  - Thread States and Transitions
  - Thread States
  - Preventing Thread Execution
  - Sleeping
  - Thread Priorities and yield( )
  - Synchronizing Code
  - Synchronization and Locks
  - Thread Deadlock
  - Thread Interaction
  - Using notifyAll( ) When Many Threads May Be Waiting

\*\*\* MCQ 2 exams and One practical exam to be conducted \*\*\*

## Day 9

- **Layered Architecture**
  - Concept of Layered Architecture
    - Importance of each layer ( Service/Business Logic, DAO/Repository, presentation/UI etc) In an application
    - JDK 1.8 New Features

## Day 10

- **Log 4j**
  - Create a property file
  - Explain about Tracers
  - Display and Store information in text file
  - Explain various formatters
- **Maven Fundamentals**
  - Introduction
  - Folder Structure
  - The pom.xml
  - Dependencies
  - Goals
  - Scopes
  - The Compiler Plugin
  - Source Plugin
  - Jar Plugin
- **TDD with Junit 5**
  - Types of Tests
  - Why Unit Tests Are Important
  - What's JUnit?
  - JUnit 5 Architecture
  - IDEs and Build Tool Support
  - Setting up JUnit with Maven
  - Lifecycle Methods
  - Test Hierarchies
  - Assertions
  - Disabling Tests
  - Assumptions
  - Test Interfaces and Default Methods
  - Repeating Tests
  - Dynamic Tests
  - Parameterized Tests
  - Argument Sources
  - Argument Conversion
  - What Is TDD?

- History of TDD
- Why Practice TDD?
- Types of Testing
- Testing Frameworks and Tools
- Testing Concepts

Assignments:

Project: All features of OOP, Collections and Files and to be done for testing also to be implemented

**Day 11:**

### Git

- Introduction to GIT
- Architecture of GIT
- Working with local and remote repositories
- Branching and Merging
- Git Methodology
- Git Plugin with IDE (Eclipse)

**Day 12:**

### SDLC & Agile

- SDLC
  - Waterfall Model
  - Agile
  - SCRUM, SPRINT
  - Agile Process Working

Assignments: One Trello requirement to be finished.

**Day 13:**

### Design Pattern

- Creational Design Pattern
  - Factory Pattern
  - Singleton Pattern
  - Prototype Pattern
- Structural Design Pattern
  - Decorator Pattern
  - Facade Pattern
- Behavioral Design Pattern

- Chain of Responsibility Pattern
- Iterator Pattern
  
- Presentation Layer Design Pattern
  - Intercepting Filter Pattern
  - Front Controller Pattern
  
- Business Layer Design Pattern
  - Business Delegate Pattern
  - Transfer Object Pattern
  
- Integration Layer Design Pattern
  - Data Access Object Pattern

\*\*\* Design patterns one application specified to be designed like Mobile Application or Doctor Diagnostics \*\*\*

## Day 14

### Database & SQL (Oracle)

- **Introduction**
  - The Relational Model
  - Normalization
  - RDBMS Keys (Candidate Key, Primary Key, Alternate Key, Composite Key, Foreign Key)
  
- **Understanding Basic SQL Syntax**
  - The Relational Model
  - Basic SQL Commands - SELECT
  - Basic SQL Commands - INSERT
  - Basic SQL Commands - UPDATE
  - Basic SQL Commands – DELETE
  
- **Querying Data with the SELECT Statement**
  - The SELECT List
  - SELECT List Wildcard (\*)
  - The FROM Clause
  - How to Constrain the Result Set
  - DISTINCT and NOT DISTINCT

## Day 15

- **Filtering Results with the Where Clause**
  - WHERE Clause
  - Boolean Operators
  - The AND Keyword



- The OR Keyword
  - Other Boolean Operators BETWEEN, LIKE, IN, IS, IS NOT
  - Text functions, date functions, number function, aggregate functions
- **Shaping Results with ORDER BY and GROUP BY**
  - **ORDER BY**
  - **Set Functions**
  - **Set Function And Qualifiers**
  - **GROUP BY**
  - **HAVING clause**
  - **Exercises on Group by aggregate and having and functions**

## Day 16

- **Matching Different Data Tables with JOINS**
  - CROSS JOIN
  - INNER JOIN
  - OUTER JOINS
  - LEFT OUTER JOIN
  - RIGHT OUTER JOIN
  - FULL OUTER JOIN
  - SELF JOIN
- **Creating Database Tables**
  - CREATE DATABASE
  - CREATE TABLE
  - NULL Values
  - PRIMARY KEY
  - CONSTRAINT
  - ALTER TABLE
  - DROP TABLE
  - End to End Exercise on Database

Assignments: 3 MCQ Exams and End to end One exercise that covers all DDL, DML, DQL commands

## Day 17

### JDBC

- **Introduction to JDBC**
  - What is JDBC,
  - 4 types of drivers,
  - Connection
  - Statement,
  - PreparedStatement,
  - ResultSet
  - Transactions
  - ResultSetMetaData

- DatabaseMetaData

## Day 18

- **JDBC Project**
  - Implement Banking and Leave Management System Project Documentation to be provided
  - Doctors Diagnostics project to be done by participants (script file to be create by participants)

\*\*\* JDBC Layered architecture End to End Application \*\*\*

## Day 19

### HTML 5, CSS 3, JavaScript, ES6 & Typescript

- **HTML 5:**
- 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

## Day 20

### CSS 3

- **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

## Day 21

- **JavaScript Essentials**
  - **Alert**
  - **Prompt**
  - **Validations**
  - **Error messages**
  - **Implementing business logic**
- **ES6 & Typescript**
  - Var, Let and Const keyword
  - Arrow functions, default arguments

- Template Strings, String methods

## Day 22

- **ES6 & Typescript**
  - Object de-structuring
  - Spread and Rest operator
  - Typescript Fundamentals
  - Types & type assertions, Creating custom object types, function types
  - Typescript OOPS - Classes, Interfaces, Constructor, etc

**\*\*\* MCQ 2 exams and end to end 3 projects to be implemented \*\*\***

## Day 23

### Servlet 3.0& JSP

- **Java Web Applications**
  - Web Applications – An Overview
  - Web Components
  - Introduction about web server
  - Apache Tomcat configuration
  - JEE Containers
- 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
- Listener
- Session Tracking
  - Introduction and Need for Session Tracking
  - Different Techniques for Session Manage

## Day 24

- **Java Server Pages (JSP)**
  - JavaServer Pages Technology, The Life Cycle of a JSP Page

- Translation and Compilation, Creating Static Content. Response and Page Encoding, Creating Dynamic Content, Using Objects within JSP Pages, Expression Language, Deactivating Expression Evaluation
- Implicit Objects, Literals & Operators
- Reserved Words
- JavaBeans Components
- Reusing Content in JSP Pages
- Transferring Control
- Jsp: param Element
- Including an Applet
- Setting Properties for
- Groups of JSP Pages
- JSP scripting elements and directives-,
- Declarations, expressions, directives,
- scriptlets, comments, actions, implicit
- JSP objects - Working with variable

\*\*\* MCQ 1 exam to be implemented with 2 Projects \*\*\*

## Day 25

- scopes – page scope, request scope,
- session scope, application scope- Using
- java beans, custom tags, Declare Default
- Content Type, Set Default Buffer Size,
- JSTL, Expression Language

## Day 26 & 27

### Hibernate

- Introduction to O-R Mapping
- Hibernate Basics,
- Hibernate Architecture,
- Hibernate Configurations,
- POJO (Plain Old Java Classes) classes
- and O/R Mapping
- XML File (hibernate.hbm.xml) tags description
- Object Identifier

\*\*\* CRUD Operations example \*\*\*

## Day 28

- One-to-One Association
- One-to-Many Association
- Many-to-One Association

- Many-to-Many Association
- Collection Mapping
- Component Mapping

\*\*\* XML-Mapping to be implemented in project \*\*\*

#### **Day 29**

- Inheritance Mapping
- Hibernate Query Language
- Criteria Queries
- Hibernate in Web Application

#### **Day 30**

##### **JSF (Java Server Faces)**

- Getting Started with JSF
- Working With Various Controls

#### **Day 31**

- Reading Inputs using JSF
- JSF Forms
- Managed Beans
- Connecting to Database using JSF
- Hiberanate and JSF Integration

#### **Day 32**

- Working with various controls like DropDown, Checkbox, radio button, submit button
- Integrating with database
- Dynamically loading data into controls
- Login Authentication
- Bootstrap using JSF

\*\*\* Basic examples using JSF \*\*\*

#### **Day 33**

- Display Data in JSF Tables
- Implementing Pagination
- Smart Searches
- Create Dashboard application using JSF

#### **Day 34**

- Creating Master Pages in JSF
- JSF Prime Faces Controls mostly used for project

#### **Day 35**

- Implement Normalization for Insurance System Project
- Create tables in MySql
- Create sample UI

\*\*\* JSF Hibernate Integration \*\*\*

#### **Day 36**

- Implement End to End Project using Hibernate and JSF (Insurance System)

#### **Day 37**

##### **EJB**

- What is Application server
- What is Difference between Webserver and Application Server
- What is EJB
- EJB Architecture
- Annotations in EJB

#### **Day 38**

- Types of Beans
- Stateless bean
- Practical Example about Stateless bean and invoke in Client

#### **Day 39**

- Statefull Bean
- Call Stateless and Statefull Beans in JSF

#### **Day 40 & 41**

- Calling EJB bean in JSF
- What is JMS
- JMS Queue
- Point to Point Message Domain

- Publisher/Subscriber and Messaging Domain

\*\*\* MCQ 2 exams on JSF and 1 Project to be done \*\*\*

#### **Day 42**

- What is Message-Driven Bean
- Managed Beans
- Integrated Message Driven Beans in JSF

#### **Day 43**

- What is Persistent Unit
- Entity
- Entity Manager
- Data Source
- JNDI

#### **Day 44**

- EJB Transactions
- Container Managed Transactions (CMT)
- Integrated with JSF

#### **Day 45**

- Bean Managed Transactions (BMT)
- Hands on Exercises
- Integrated with JSF

#### **Day 46**

- EJB Security
- Important Terms in Security
- Container Managed Security

#### **Day 47**

- What is EJB Context
- What is Session Context
- What is Message Driven Context

#### **Day 48**

- What is EJB Dependency Injection (DI)



- What is EJB Annotations (@EJB, @Resource, @ActivationConfigProperty)
- What is Message Driven Context

#### **Day 49**

- EJB Relationships
- One to One/ One to Many/ Many to Many
- What is EJB Query Language

\*\*\* MCQ 3 Exams and End to end project EJB + JSF Integration \*\*\*\*

#### **Day 50– 54 Days (5 Days)**

- End to End Project using JSF and EJB using Transaction Management
- Integration of all module and End to End testing