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JEE FULL STACK 2 WITH DEVOPS & CLOUD(AWS).

JEE with DevOps & Cloud(AWS) variant provides exposure to the entire spectrum of Java technologies starting from Core Java to Spring. It focuses on Web Application development using DevOps & AWS and Spring Technology. The following table lists the course structure.

Sr. No.	Course	Duration	Immersive approach Remarks
1	Discover (Induction)	0	Online
2	Soft Skills Foundation – Part 1	1	
3	Core Java 8 + Database & PostGreSQL with DevOps (Git, SonarQube, Gradle)	12.5	Project kick off-Individual project use cases has to be implemented
4	Core Java 8 Test	0.5	Coding and MCQ Test
5	Soft Skills Foundation – Part 2	1	
6	JPA with Hibernate with PostgreSQL	2	
8	Spring 5.0 (Core + MVC + REST + Data JPA + Data REST+ Microservices) with Jenkin	8	
7	Soft Skills Foundation – Part 3	1	
9	Sprint 1 + JPA and Spring with Microservices MCQ Test	5	Sprint 1 - Backend implementation using Spring REST and Spring Data JPA+Microservices+ With DevOps- Jenkin,Git,Gradle & SonarQube
10	Sprint 1 Evaluation	1	
11	Soft Skills Foundation – Part 4	1	
12	Docker	2	
13	Kubernetes	3	
14	AWS	4	Sprint 2 - Devops +AWS

15	Sprint 2+AWS+Docker+kubernetes + MCQ Test	3	
16	Sprint 2 Evaluation	1	
17	L1 Preparation	1	
18	L1 Test	1	
	Total Training Duration	48	

Agile SCRUM

Execution:

- Week 1 – Participants to complete Agile coursera course to understand Agile methodology before Project Kick off to understand and use daily scrum meeting, Project Backlog, Sprint Backlog, Sprint review.
- Week 1 Project Kick off – Expectation setting by BU Mentor
 - Sprint Planning , Group formed , Case study shared . (BU Support)Declarations and
- Week 2 - Requirement review ,Understanding and Design artifacts , Use case , class , sequence diagram to prepared
- Week 4 - Artifacts Reviewed and Functional requirement design through interfaces , Test Cases.
- Sprint 1 implementation with code reviews of L&D and BU trainer
 - Test case reviews
 - Code reviews
 - Performance monitoring during the sprint implementation and sharing the feedback
 - Sprint - 1 Evaluation 30mins/participant
- Sprint 2 implementation with code reviews of L&D and BU trainer
 - Test case reviews
 - Code reviews
 - Performance monitoring during the sprint implementation and sharing the feedback
 - Sprint - 2 Evaluation 30min/participant

Core Java 8

Program Duration: 10.5 days

Contents:

- **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
- Declaring an Interface
- Declaring Interface Constants
- Declare Class Members
- Access Modifiers
- Nonaccess Member Modifiers
- Constructor Declarations
- Variable Declarations
- Declaring Enums
- **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
- **Assignments**
 - Stack and Heap—Quick Review
 - Literals, Assignments, and Variables
 - Literal Values for All Primitive Types
 - Assignment Operators
 - Casting Primitives
 - Using a Variable or Array Element That Is Uninitialized and Unassigned
 - Local (Stack, Automatic) Primitives and Objects
 - Passing Variables into Methods
 - Passing Object Reference Variables
 - Does Java Use Pass-By-Value Semantics?
 - Passing Primitive Variables
 - Array Declaration, Construction, and Initialization
 - Declaring an Array

- Constructing an Array
- Initializing an Array
- Initialization Blocks
- Using Wrapper Classes and Boxing
- An Overview of the Wrapper Classes
- Creating Wrapper Objects
- Using Wrapper Conversion Utilities
- Autoboxing
- Overloading
- 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
- **Operators**
 - Java Operators
 - Assignment Operators
 - Relational Operators
 - instanceof Comparison
 - Arithmetic Operators
 - Conditional Operator
 - Logical Operators
- **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
 - 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
- **Gradle Fundamentals**
 - Introduction

- Folder Structure
- Install and Setup Gradle on Windows

- Dependencies in Build Scripts
- Gradle Wrapper
- Lifecycle Tasks: The Base Plug In
- Using Project Info and the check command
- Creating Variables and external properties
- Creating a Build Scan
- Dependencies

- **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
 - Insights from Testing
 - Mocking Concepts
 - Mockito Overview
 - Mockito Demo
 - Creating Mock Instances
 - Stubbing Method Calls

- **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
- **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
- **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
- **Lambda Expressions**
 - Introduction
 - Writing Lambda Expressions
 - Functional Interfaces
 - Types of Functional Interfaces
 - Method reference
- **Stream API**
 - Introduction
 - Stream API with Collections
 - Stream Operations

Database Using PostgreSQL

Duration : 2 days

Contents:

- **Introduction**
 - The Relational Model
 - What is PostgreSQL?
 - PostgreSQL – Data Types
 - Arrays Functions and Operators
- **Understanding Basic PostgreSQL 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**
 - Wildcards (% , _)
 - The SELECT List
 - SELECT List Wildcard (*)
 - The FROM Clause
 - How to Constrain the Result Set
 - DISTINCT and NOT DISTINCT
- **Arrays Functions and Operators**
 - array_append
 - array_cat
 - array_lower
 - array_to_string
 - array_agg

- every, Count, sum, avg
 - Array Operators
- **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
- **Shaping Results with ORDER BY and GROUP BY**
 - ORDER BY
 - Set Functions
 - Set Function And Qualifiers
 - GROUP BY
 - HAVING clause
- **Matching Different Data Tables with JOINS**
 - Table Aliases
 - CROSS JOIN
 - INNER JOIN
 - OUTER JOINS
 - LEFT OUTER JOIN
 - RIGHT OUTER JOIN
 - FULL OUTER JOIN
 - SELF JOIN
 - Natural Join
- **Creating Database Tables**
 - CREATE DATABASE
 - CREATE TABLE
 - NULL Values
 - PRIMARY KEY
 - CONSTRAINT
 - ALTER TABLE
 - DROP TABLE
- **PostgreSQL Transactions**
 - BEGIN, COMMIT, ROLLBACK
- **PostgreSQL Constraints**
 - CHECK, UNIQUE, NOT NULL

DevOps/ CI CD concepts (GitHub/Nexus, CI Jenkins, Sonar)

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 Gradle & Git
- Jenkins With TDD(Junit testing)
 - Integration of junit testing with Jenkins
- Sonar

JPA Using PostgreSQL

Program Duration: 2 days

Contents:

- **Introduction**
 - Introduction & overview of data persistence
 - Overview of ORM tools
 - Understanding JPA
 - JPA Specifications

- **Entities**
 - Requirements for Entity Classes
 - Persistent Fields and Properties in Entity Classes
 - Persistent Fields
 - Persistent Properties
 - Using Collections in Entity Fields and Properties
 - Validating Persistent Fields and Properties
 - Primary Keys in Entities
- **Managing Entities**
 - The EntityManager Interface
 - Container-Managed Entity Managers
 - Application-Managed Entity Managers
 - Finding Entities Using the EntityManager
 - Managing an Entity Instance's Lifecycle
 - Persisting Entity Instances
 - Removing Entity Instances
 - Synchronizing Entity Data to the Database
 - Persistence Units
- **Querying Entities**
 - Java Persistence query language (JPQL)
 - Criteria API
- **Entity Relationships**
 - Direction in Entity Relationships
 - Bidirectional Relationships
 - Unidirectional Relationships
 - Queries and Relationship Direction
 - Cascade Operations and Relationships

Spring 5.0

Program Duration: 13 days

Contents:

1. Spring Core

Spring Core Introduction / Overview

- Shortcomings of Java EE and the Need for Loose Coupling
- Managing Beans, The Spring Container, Inversion of Control
- The Factory Pattern
- Configuration Metadata - XML, @Component, Auto-Detecting Beans
- Dependencies and Dependency Injection (DI) with the BeanFactory
- Setter Injection

Spring Container

- The Spring Managed Bean Lifecycle
- Autowiring Dependencies

Dependency Injection

- Using the Application Context
- Constructor Injection
- Factory Methods
- Crucial Namespaces 'p' and 'c'
- Configuring Collections

Metadata / Configuration

- Annotation Configuration @Autowired, @Required, @Resource
- @Component, Component Scans. Component Filters
- Life Cycle Annotations
- Java Configuration, @Configuration, XML free configuration
- The Annotation Config Application Context

2. Spring MVC

Introduction / Developing Web applications with Spring MVC

- The WebApplicationContext and the ContextLoaderListener
- Model View Controller
- Front Controller Pattern
- DispatcherServlet Configuration
- Controllers, RequestMapping
- Working with Forms
- Getting at the Request, @RequestParam, @RequestHeader
- ModelAndView

Advanced Techniques

- Spring form tags and Model Binding, @ModelAttribute

Spring Controllers

- Using @ResponseBody
- JSON and XML data exchange

RESTful Web Services

- Core REST concepts
- REST support in Spring 5.x
- Use Spring MVC to create RESTful Web services
- REST specific Annotations in Spring
- Working with RestTemplate
- URITemplates, @PathVariable, @RequestParam
- JSON and XML data exchange
- @RequestMapping

3. Spring Boot

SPRING BOOT Introduction

- Spring Boot starters, CLI, Gradle plugin
- Application class
- @SpringBootApplication
- Dependency injection, component scans, Configuration

- Externalize your configuration using application.properties
- Context Root and Management ports
- Logging

Using Spring Boot

- Build Systems, Structuring Your Code, Configuration, Spring Beans and Dependency Injection, and more.

Spring Boot Essentials

- Application Development, Configuration, Embedded Servers, Data Access, and many more
- Common application properties
- Auto-configuration classes
- Spring Boot Dependencies

4. Spring Data JPA

- Spring Data JPA Intro & Overview
- Core Concepts, @RepositoryRestResource
- Defining Query methods
- Query Creation
- Using JPA Named Queries
- Defining Repository Interfaces
- Creating Repository instances
- JPA Repositories
- Persisting Entities
- Transactions

5. Spring Data REST

- Introduction & Overview
- Adding Spring Data REST to a Spring Boot Project
- Configuring Spring Data REST
- Repository resources, Default Status Codes, Http methods
- Spring Data REST Associations
- Define Query methods

6. Microservices

Microservices Overview

- Microservices architecture
- Core characteristics of microservice
- Use cases and Benefits
- Design standards
- Monolithic Architecture
- Distributed Architecture
- Service oriented Architecture
- Microservice and API Ecosystem
- Microservices in nutshell
- Point of considerations
- SOA vs. Microservice
- Microservice & API

Environment Management with Centralized Configuration

- Role of Configuration in microservices
- Spring cloud config
- Creating a configuration server
- Consuming configurations in apps

Performance Issues Using Distributed Tracing

- Role of tracing in microservices
- What is Spring Cloud Sleuth?
- Adding Spring Cloud Sleuth to a project
- Visualizing latency with Zipkin
- Adding Zipkin to a solution

Locating Services at Runtime Using Service Discovery

- Role of service discovery in microservices
- Describing spring cloud Eureka
- Creating Eureka Server
- Registering Services with Eureka
- Configuring health information
- Actuator & Profiles

Protecting Systems with Circuit Breakers

- Role of circuit breakers in microservices
- Describing Spring Cloud Hystrix
- Creating a Hystrix-protected service
- Using the Hystrix Dashboard

Routing Your Microservices Traffic

- Role of routing in microservices
- Describing Spring Cloud Ribbon
- Configuring Ribbon
- Describing Spring Cloud Zuul
- Creating a Zuul proxy
- Zuul route Configurations

Spring Security & Outh2

- Spring Security
- Spring Security with Spring boot
- Outh2
- Outh2 with Spring Boot

Docker

Program Duration: 2 day

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
- **Deploying a Containerized App**
 - Module Overview
 - Warp Speed Run-through
 - Containerizing an App
 - Hosting on a Registry
 - Running a Containerized App
 - Managing a Containerized App
 - Multi-container Apps with Docker Compose
 - Taking Things to the Next Level with Docker Swarm
 - Microservices and Docker Services
 - Multi-container Apps with Docker Stacks
 - Docker Swarm
- Introduction to images and Repository naming , Automated build, Private distribution

Kubernetes

Program Duration: 3 day

Contents

- **Introduction of Kubernetes**
 - What Is Kubernetes?
 - Kubernetes What and Why
- **Kubernetes Architecture**
 - Module Overview
 - Kubernetes Big Picture View
 - Kubernetes Masters

- Kubernetes Nodes
- The Declarative Model and Desired State
- Kubernetes Pods
- Stable Networking with Kubernetes Services
- Game Changing Deployments
- The Kubernetes API and API Server
- Api Server
- Scheduler
- Controller Manager
- etcd - the cluster brain
- **Getting Kubernetes**
 - Module Overview
 - Getting kubectl
 - Getting K8s in the Cloud
- **Working with Pods**
 - Module Overview
 - App Deployment Workflow
 - Creating a Pod Manifest
 - Deploying a Pod
 - Deployment vs StatefulSet
 - Pod Identity
 - Scaling database applications: Master and Worker Pods
 - Pod state, Pod Identifier
 - 2 Pod endpoints
- **Kubernetes Deployments**
 - Module Overview
 - Kubernetes Deployment Theory
 - Creating a Deployment YAML
 - Deploying a Deployment
 - Self-healing and Scaling
 - Rolling Updates and Rollbacks
- **ClusterIP Services**
 - Service Communication
 - Multi-Port Services
 - Headless Services
 - NodePort Services
 - LoadBalancer Services
- **Helm - Package Manager**
 - Package Manager and Helm Charts
 - Templating Engine
 - Use Cases for Helm
 - Helm Chart Structure

- Values injection into template files

AWS

Program Duration: 7 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
- 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
 - Hybrid cloud
- 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
 - Amazon 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
- Serverless computing
 - AWS Lambda
 - AWS Fargate
- Manage
 - EKS, ECR, ECS