**Spring Boot & Micro Services Modules**

* Module 1: Spring Boot Framework Internals
* Module 2: Spring Boot Data JPA
* Module 3: Spring MVC
* Module 4: Restful Web services
* Module 5: Micro services with Spring Cloud
* Module 6: Docker & Docker-compose (Containerization Deployment)
* Module 7: Monitoring micro services Metrics & Health (Prometheus & Grafana)
* Module 8: Kubernetes Deployment in Google Cloud Platform
* Module 9: 200 + Interview Guide

**Module 1: Spring Boot Framework Internals**

* Application Types
* Standalone Application
* Web Application
* Distributed Application
* Spring V/s Spring Boot
* Spring Boot Features
* Environment setup
* Parent Project in Boot
* Boot Dependencies/Starters
* @SpringBootApplication Annotation
* Spring Boot Bootstrapping process(run() internal logic)
* Component Scanning
* Spring Bean(Eager Loading V/s Lazy Loading)
* Spring Bean Eager 2 Lazy conversion
* Spring Boot Bean Lifecycle methods
* By using interface methods
* By using annotations
* Spring Bean Scopes
* Singleton
* Prototype
* Request
* session
* Auto Configuration
* Embedded Servers
* Tomcat
* Jetty
* Undertow
* Stereo type annotations
* @Component
* @Controller
* @RestController
* @Service
* @Repository
* Dependency Injection
* Setter Injection
* Constructor Injection
* Field Level Injection
* Setter Injection V/s Constructor Injection
* Spring Boot jar generation & execution
* IOC Containers, Auto wiring modes & Qualifier
* Banners in Spring Boot
* Runners in Spring Boot
* Application Runners
* Command Line Runners
* Logging Framework
* Reading keys from .properties/yml
* @PropertySource with @ConfigurationProperties
* @PropertySource with @Value
* Singleton scope V/s Singleton Design Pattern
* Annotations
* @Configuration
* @Bean
* @Autowired
* @Qualifier
* @ConfigurationProperties
* @PropertySource
* @Value
* @Order
* @Lazy
* @Primary
* @SpringBootApplication
* @Lookup
* @Import

**Module 2: Spring Data JPA**

* What is Persistence Layer?
* What is Spring Data?
* ORM Basics
* JPA Annotations
* CRUD Repository & JPA Repository
* Pre-defined Repository Methods
* @Query Annotation
* Native SQL Queries using @Query
* HQL Queries using @Query
* Positional& Named Parameters
* Find By Methods in Spring Data JPA
* Design Custom methods using @Query
* Pagination using JPA
* Sorting using JPA
* Generators
* Schema Generation Create/update /validate create-drop

**Module 3: Spring MVC**

* What is Web Application?
* MVC Architecture?
* Front Controller Design Pattern
* Spring MVC Components
* Dispatcher Servlet
* Handler Mapping
* View Resolver
* Model and View
* @ModelAttribute
* @Controller Annotation
* Send Data Controller to UI
* Send Data UI to Controller
* Embedded Containers
* Embedded Database (H2)
* Read Properties from property files
* application.properties V/s application.yml

**Module 4: Restful Services**

* Introduction to Web Services
* Soap vs Rest
* Query String vs PathParams
* REST Architecture Principles
* Rest Resource & Rest Client
* HTTP Methods,Http Status codes & Messages
* CRUD operation using Rest API
* Exception Handling in Spring Boot
* @RestController V/s @Controller
* Swagger Documentation
* Rest Template Communication
* OAuth2 Implementation
* @RequestBody V/s @ResponseBody
* @RequestParam V/s @PathVariable

**Module 5: Mini Project Implementation without micro services**

**Module 6: Micro Services**

* Monolithic vs Micro Services
* Micro Services principles
* Micro Services challenges
* Micro Services advantages & Micro Services architecture
* Twelve Factor Principles
* Service Registry & Discovery(Eureka Server)
* Services Design using Rest API
* Services communication using Rest Template
* Services communication using Feign Client
* API Gateway(ZuulProxy) creation for Micro Services
* Ribbon Load Balancer.
* Distributed Tracing using zapping & sleuth
* Fault Tolerance using Circuit Breaker
* Spring Boot actuators & DevTools
* Admin Server & Admin Client
* Apache Kafka integration with Micro Services
* Centralized Configuration
* Spring Boot Config Server & spring Boot config Client
* Spring Boot Profiles

**Module 7: Mini Project Implementation using micro services**

**Module 8: Docker Architecture & Deep dive on Docker Commands**

* Introduction to Dockers
* Docker Architecture
* Understanding Docker Hub & Installing Docker
* Creating Docker Images using Docker File
* Deep Dive of Important Docker Commands
* Publishing Docker images from your local to remote Docker hub Repository
* Deep dive on Docker-compose
* Micro services deployment using Docker-Compose

**Module 9: Kubernetes Deployment (GCP) for Micro Services**

* Introduction to Kubernetes
* Deep dive of Kubernetes Internal Architecture
* GCP Account Setup & Creating K8s Cluster
* Exploring K8s cluster & Establish connection
* Deep dive on Kubernetes YAML Configuration
* Kubernetes YAML Configurations for applicable Micro services
* Create Environment Variables inside K8s Cluster using ConfigMap
* Deploying our Micro services to Kubernetes Cluster
* Kubectl Commands and validating our micro services deployed into K8s cluster
* Automatic Self-healing inside Kubernetes Cluster
* Automatic Rollout & Roll back inside Kubernetes Cluster
* Logging & Monitoring inside Kubernetes Cluster
* Auto scaling inside Kubernetes cluster using HPA
* Deleting Kubernetes Cluster inside GCP

**Module 10: Microservices Monitoring**

* Different approaches to monitor micro services
* Setup Micrometer inside micro services
* Setup of Prometheus to monitor micro services
* Setup of Grafana to monitor micro services with inbuilt dashboards
* Building Custom Dashboards inside Grafana
* Sending alerts using Grafana when service is down

**Module 11: Interview Guide for Spring Boot Micro services**

**Module 12: Devops Tools**

* GitHub
* Maven
* Jenkins
* Docker
* Kubernetes
* SonarQube/PMD