Java8 Webservices Camel SpringBoot Microservices Docker K8s- Course Outline

Topic	Module	Day	Topic of Coverage	Duration (in hrs)
Java 8	Java 8 Features	Day 1	• Core Java Recap • OOPs Concepts Recap • Fundamentals of Functional Programming • Lambda Expressions • Functional Interfaces • Stream API - foreach, map, filter, parallel processing, collectors, etc. • Method References • Default Methods • Optional Class • New Date/Time API • Gradle Overview	8
Webservices	SOAP	Day 2	• Webservices Overview • SOAP Webservices Overview • SOAP Building Blocks - Envelope, Header, Body • UDDI Overview (Universal Description, Discovery and Integration) • WSDL Overview (Web Service Description Language) • SOAP HTTP Binding • SOAP RPC and Document style • SOAP Encoding • SOAP Standards • WS Security Overview • JAX-WS Overview • Create and publish SOAP based Web Services • Build client to consume SOAP based Web Services	8
	REST		• RESTful Webservices Overview • REST concepts • SOAP vs REST • Defining REST API • WADL Overview • JAX-RS Overview • Spring REST Overview • Working with different Media Types • Securing REST API • HATEOAS Maturity Model • REST Clients - Postman, REST Client API, REST Template • Create and publish RESTful Web Services • Build client to consume RESTful Web Services	

Camel	EIP & Camel	Day 3	• Intro to EIP (Enterprise Integration Patterns) • Introduction to Camel • Developing EIPs with Camel • Understanding Camel architecture, components, expressions, predicates and interceptors • Understanding Java DSL, Spring based XML configuration • Understanding SEDA queues • Understanding different types of end points • Understanding message parser, formatters and processors • Understanding Camel error handling • Create camel routes with different endpoints	8
Spring Boot	Introduction to Spring Boot	Day 4	• Spring Framework Overview • Spring Integration Overview • Spring Boot Overview • Spring Boot CLI • Integration with IDE • Create Spring Boot Project o Spring Maven Project o Spring Starter Project o Spring Initializr o Spring Boot CLI • Spring Boot Sample Application	8
	Spring Boot Internals and Features		• Configuration • Auto-Configuration • @SpringBootApplication Annotation • Externalized Configuration • Profiles • Logging • Packaging	
	Spring Boot SOAP & REST API		• Spring REST Overview • Spring Boot support for Spring REST • Spring Boot support for SOAP • Embedded web container support • Sample webservices using Spring Boot	
	Data Access with Spring Boot	Day 5	• Spring Boot support for SQL Databases o JdbcTemplate o JPA (Hibernate) o Spring Data • Embedded database support (H2) • Sample web application with data	8
	Monitoring and Management		• Actuator Overview • Endpoints • Developer Tools	

Microservices	Introduction to Microservices	Day 6	• Architectural Styles Overview • Monolith Architecture • Service Oriented Architecture (SOA) • Distributed Architecture • Twelve Factor Principles for Application Development • Microservice Based Architecture (MSA) • Microservice and API Ecosystem • Microservice characteristics • Microservice Concepts Overview • Benefits and limitations • Microservice Reference Architecture • Example with Monolith Application and Microservice Application	8
	Microservices Design	Day 7	• Domain Driven Design • Ball of Mud • Big Mud Ball to Sweet Gems • Microservices Design Patterns Overview o Service Decomposition o Cross Cutting Concerns (Microservice Chasis, Externalized Configuration) o Service Discovery o API Gateway o Communication Styles (Messaging, Remote Procedure Invocation) o Data Management (Saga, Event Sourcing, Application Event) o Database Querying (API Composition, CQRS) o Transactional Messaging o UI Patterns o Reliability (Circuit Breaker) o Observability (Distributed Tracing, Log Aggregation) o Security o Testing o Deployment o Service Mesh	8
	Microservices with Spring Cloud	Day 8	• Introduction to Spring Cloud • Create Spring Boot app with Spring Cloud • Centralized and versioned Configuration Management with Spring Cloud Config • Dynamic Configuration updates with Spring Cloud Bus • Service Discovery with Spring Cloud Netflix Eureka • Applying circuit breakers with Spring Cloud Netflix Hystrix • Load Balancing with Spring Cloud Netflix Ribbon • Declarative REST clients with Spring Cloud Netflix Feign • Working with API Gateway - Zuul • Sample Microservices based application applying above concepts	8

	Inter-service Communication / Distributed Caching	Day 9	• Inter service communication with RabbitMQ and Kafka • Distributed caching with Redis	8
	Testing Microservices	Day 10	• Testing scenarios and strategy • Test at Different Levels • Unit Testing with JUnit • Integration Testing with REST Assured • Intro to Load Testing with Gatling (with Scala scripting) • Testing Best Practice for Microservices	8
	WSO2 API Manager (API Gateway)	Day 11	• WSO2 API Manager Overview • Key Features • Architecture • Key Components • Design API • Develop API • Publish API • Manage API • Monitor API • Working with API Publisher • Working with Developer Portal • Working with API Manager UI • Working with API Controller CLI • Using as API Gateway	8
	Securing Microservices	Day 12	• MicroServices Security Principles • Spring Security Concepts • Access Tokens • Oauth 2.0 • JWT	8
	Monitoring Microservices	Day 13	• Distributed Tracing with Zipkin • Logging & Auditing with Elasicsearch • Monitoring with Kibana / Grafana dashboard	8
	Deploying Microservices (Containerization with Docker)	Day 14	• Deployment Patterns Overview • Introduction to Docker • Docker Architecture • Virtual Machines vs Containers • Docker Setup and Configuration • Components o Docker Engine o Docker Registry o Docker Compose o Docker File, Images • Managing Container Linking, Storage, Networking and Logging • Create Docker File for Spring Boot application	8

			• Build Docker image • Deployment workflow • Docker Automation with Continuous Integration • Hands-on exercise to package spring boot microservices into Docker images and deploy	
	Deploying Microservices (Container Management with Kubernetes)	Day 15	• Service Mesh Pattern Overview • Kubernetes Overview • Kubernetes Architecture • Kubernetes Setup and Configuration • Components - Node, Service, Pod • Features Overview o Kubernetes Job o Replication o Deployments o Volumes o Secrets o Network Policies • Creating and deploying an application in Kubernetes with Docker • Configure Auto Scaling and High Availability • Managing and accessing Kubernetes cluster with API and Kubectl • Kubernetes Monitoring with Dashboard	8