

DevSecOps – Kubernetes pipeline Security

Duration: 5 Days (8Hours per day)

Hands-On Format: This hands-on class is approximately 80/20 lab to lecture ratio, combining engaging lecture, demos, group activities and discussions with comprehensive machine-based practical programming labs and project work.

Module 1 – Introduction

DevOps vs DevSecOps
Security Aspects

Module 2 – DevOps Pipeline

Git Repository
VM Configuration
Create Azure VM
Jenkins Introduction
Jenkins Plugin Installation
Jenkins Pipeline – Checking Versions
Understanding the Usecase
Running Microservices on Local Machine
Maven Basics
Jenkins GitHub Integration and Maven Build
Unit Tests Basic
Unit Test and JaCoCo
Docker Basics
Kubernetes Basics

Module 3 – DevSecOps Pipeline

Git Hooks and Talisman Introduction
Talisman Demo
Mutation Tests – PIT Basics
Mutation Tests – PIT Demo
SonarQube introduction
SonarQube – Quality Gate
SonarQube Authentication Clarification
Vulnerability Basics
Dependency Check Basics
Dependency Check Demo
Refactoring Jenkins
Trivy Basics
Trivy Image Scan
OPA Conftest Basics
OPA Conftest – Docker
Kubernetes Security Concepts
Demo – OPA Conftest Kubernetes
Kubernetes Deployment Rollout
Kubesec Basics
Kubesec – Demo
Fixing Script and ReadOnlyRootFileSystem
Trivy – Kubernetes
Integration Tests
DAST Basics
OWASP ZAP Basics
OWASP ZAP – Basics

OWASP ZAP – Jenkins Scan
OWASP ZAP – Fixing Issue
OWASP ZAP – Ignore Test Cases
Slack Notification – Legacy App

Module 4 – Kubernetes Operations and Security

CIS Benchmarking and Kube-bench
Kube Bench Demo
Pod-Pod Communication – Need for mTLS
Istio Basics
Istio Installation
Istio Injecting SideCar Container
Promoting App to Prod and Visualize using Kiali
Istio mTLS Basics
Istio mTLS Demo
Istio Ingress Gateway and VirtualService
Kubernetes Monitoring Basics
Prometheus Basics
Prometheus Grafana
Falco Basics
Falco Installation – CLI
Falco UI – HELM
Falco Slack Notifications
KubeScan Demo
Integration Tests – Prod
Slack Jenkins Custom App
Slack Attachments
Slack – Get Failed Stage Name

Module 5 – HashiCorp Vault + Kubernetes

Kubernetes Secrets and Its Drawback
Vault Helm Installation Demo
Vault Initialization
Vault Secrets Engine
Vault Authorization
Vault Authentication
Vault PHP Application
Vault Annotations and Template
Vault – How it works Internally?

Module 6 – Environment Variable

Plain Key
Config Map
Secret
Mount Variable as Volume