

## DevSecOps – Kubernetes pipeline Security

**Duration:** 4 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  
Kubesecc Basics  
Kubesecc – 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