Trainer: **Raghu K**

Azure DevSecOps Training
Complete Syllabus 2026

Master Cloud-Native DevOps, Security, and AI-Powered Automation with an industry-aligned, hands-on curriculum that takes you from fundamentals to production-grade expertise.

14 Weeks | 5 Days / Week | 100% Hands-On | Live + Lab

13 Modules + Capstone | CKA / AZ-104 / Terraform Cert Aligned

www.joindevops.com

★ WHY CHOOSE US

Why This Training?

Built by practitioners, refined by thousands of students, and designed for real-world impact.

Industry-Aligned Curriculum

Inspired by and aligned with **roadmap.sh/devops**, our syllabus covers every skill modern DevOps engineers need — from Linux to AI-powered operations. No gaps, no fluff.

One Trainer, All Topics

Raghu K teaches every single module. No hand-offs between instructors means a **consistent, coherent learning experience** where every concept builds on the last.

Live Enterprise-Grade Project

You won't just learn tools in isolation. You'll build and deploy a **complete microservices application** on Azure with full CI/CD, security gates, and observability — exactly like a production environment.

8500+ Students Trained

A proven track record with over **8,500 students** successfully trained and placed in top companies. Our graduates are working at startups and Fortune 500 enterprises alike.

“If you find content more comprehensive than ours at this price, let us know and take the course for FREE!”

— That's how confident we are in this syllabus.

YOUR TOOLKIT

Tools You'll Master

Gain hands-on proficiency with the most in-demand DevSecOps tools in the industry.

Linux	OS
Bash	SCRIPTING
Git	VCS
GitHub Actions	CI/CD
Azure Cloud	CLOUD
Python	SCRIPTING
Ansible	CONFIG MGMT
Terraform	IAC
Docker	CONTAINERS
Kubernetes	ORCHESTRATION
Helm	PACKAGE MGR
ArgoCD	GITOPS
SonarQube	CODE QUALITY
Vault	SECRETS
Trivy	SECURITY
Prometheus	MONITORING
Grafana	DASHBOARDS
ELK Stack	LOGGING
OpenTelemetry	OBSERVABILITY
New Relic	APM
Istio	SERVICE MESH
AI / AIOps	AUTOMATION

CONTENTS

Table of Contents

14 weeks of structured, progressive learning across 13 modules.

DETAILED SYLLABUS

Course Modules

Deep-dive into every module. Each topic is covered with live demos and hands-on labs.

MODULE 01

Linux & Shell Scripting

Week 1

1.1 Linux Fundamentals

- ✓ Anatomy of Linux
- ✓ Directory Structure in Linux
- ✓ Linux Command Line Introduction

1.2 File & Directory Management

- ✓ ls, touch, rm, cp, mv commands
- ✓ Rename directories using mv
- ✓ cd, pwd, mkdir, rm -r, cp -r commands

1.3 Text Processing & Search

- ✓ vim editor
- ✓ find (find files)
- ✓ grep (word search), awk (column filter), head & tail (line filters)

1.4 System Utilities

- ✓ curl (download content)
- ✓ Pipes in the command line
- ✓ tar and unzip (extract compressed files)

1.5 Process & User Management

- ✓ ps and kill (process management)
- ✓ sudo command & sudoers configuration
- ✓ useradd (user management)

1.6 Software & Service Management

- ✓ dnf (package management)
- ✓ systemctl (service management)

1.7 Permissions & Networking

- ✓ chown, chgrp (ownership)
- ✓ Network info commands
- ✓ chmod (file permissions)

1.8 Shell Scripting

- Problems solved by shell scripting, use cases and limitations
- Writing, getting, and executing shell scripts
- Special variables, taking input, single vs double quotes, exit status
- Conditional statements: if, case
- Input redirectors, SED editor, sourcing files
- Types of shell scripting & why Bash is famous
- Variables: declaring, accessing, command substitution, arithmetic substitution
- Functions: declaring, scope, return status
- Loops: while, for

1.8 Networking for DevOps NEW

- TCP vs UDP, ports, sockets
- HTTP/HTTPS, status codes (2xx, 3xx, 4xx, 5xx)
- CIDR notation & subnetting basics
- Firewalls, iptables, network troubleshooting (ping, traceroute, netstat, curl, dig, nslookup)
- DNS resolution — how domains resolve to IPs
- SSL/TLS handshake & certificates
- Load balancing concepts (L4 vs L7)

MODULE 02

Azure Cloud Fundamentals

Week 2

Note: Advanced Azure services (AKS, Key Vault, WAF, FinOps) are covered contextually throughout the course in their respective modules.

2.1 Getting Started

- Azure Account SignUp
- Azure Regions and Zones
- Resource Groups

2.2 Networking & Security

- Public IP & Private IP
- NSG Inbound & Outbound Rules
- Subnets and Private Subnets
- NAT Gateway and Implementation
- Subnet Network Security groups
- Azure Landing Zone Overview
- Network Security Groups on Subnets and Resources
- Virtual Network (VNET)
- Route tables Private subnets
- Subnet Categorization
- Azure VNET Peering

2.3 Compute (Virtual Machines)

- ✓ Virtual Machines
- ✓ Creation of a Virtual Machine
- ✓ Connect to Linux Azure VM Server from Windows / Mac / Linux Desktop
- ✓ Azure VM Spot Instances
- ✓ Azure VM Spot Eviction Policies

2.4 DNS

- ✓ Azure DNS Zones
- ✓ Azure Private DNS Zones

2.5 Identity & Access (Microsoft Entra ID)

- ✓ Microsoft Entra ID (Azure Active Directory [AAD])
- ✓ Users and groups in Entra ID
- ✓ Role assignments to Users and Groups
- ✓ Azure Role assignments and Role definitions
- ✓ App Registrations (Service Principals)

2.6 Storage

- ✓ Storage Accounts
- ✓ Azure Blob Storage
- ✓ Azure Cool Storage
- ✓ Azure Archive Storage
- ✓ Encrypting Blob storage
- ✓ Versioning data in Blob storage

2.7 Security & Encryption

- ✓ Azure Key Vault (Keys, Secrets & Certificates)
- ✓ Data encryption using Keys (Azure Key Vault)
- ✓ Azure WAF
- ✓ Azure DDoS Protection
- ✓ App Service Certificate

2.8 Database Services

- ✓ CosmosDB Overview, Create CosmosDB Cluster, CosmosDB in private connectivity
- ✓ Azure Cache for Redis Overview, Create Redis Cluster, Redis in private connectivity
- ✓ Azure Database for MySQL, Create MySQL Server, MySQL Server in private connectivity
- ✓ Backup Policies

2.9 Load Balancing & Auto Scaling

- ✓ Azure Application Gateway
- ✓ Azure Load Balancer
- ✓ Public & Internal Load Balancers
- ✓ Backend Pools
- ✓ Expose private apps running on private servers over Load Balancer
- ✓ Azure Autoscale
- ✓ Virtual Machine Scale Sets

2.10 Container Services

- Azure Container Registry
- Azure managed identities (System & User managed)
- Azure Kubernetes Service

2.11 Monitoring & Management

- Azure Portal
- Application Insights
- Azure Resource Manager (ARM Templates)
- Log Analytics
- Azure Monitor

2.12 Other Essential Services

- Azure Functions
- Azure management groups
- Azure compute gallery
- Azure CDN
- Azure Native ISV Service

2.13 FinOps & Cost Optimization NEW

- Azure Cost Management & Billing
- Right-sizing instances
- Cost allocation and budgets
- Resource tagging strategies
- Spot instance strategies

MODULE 03

Git, GitHub & GitHub Actions

Week 3

3.1 Version Control with Git

- Introduction to code repositories & Git
- Code editors & productivity
- Commit messages: importance & effective writing
- Git tags: what and when
- Git commit history
- GitOps: introduction & implementation
- Short-living vs Long-living branches
- Clone, modify, and push code to remote repositories
- Branch best practices & scenarios for branching
- Pulling code & pushing local changes
- Merging branches to master
- Application release strategy using Git repos
- Trunk Based Development (TBD)

3.2 Collaboration with GitHub

- Introduction to GitHub
- Creating repositories
- Creating & optimizing GitHub profile for job marketing
- Pull requests & peer reviews

3.3 GitHub Actions (CI/CD)

- ✓ Overview & basic concepts: Workflows, Events, Jobs, Steps, Runners, Actions
- ✓ Writing workflow files & YAML syntax
- ✓ Environment variables and secrets
- ✓ Using official and community actions
- ✓ Conditional executions
- ✓ Integrating with external services
- ✓ Setting up repository for GitHub Actions
- ✓ Triggering workflows (push, pull_request, etc.)
- ✓ Job configuration: dependencies and parallel execution
- ✓ Managing workflow dependencies and artifacts
- ✓ Deploying to Azure and Kubernetes
- ✓ Notifications and best practices

MODULE 04

Ansible — Configuration Management

Week 4

4.1 Introduction

- ✓ Problems of shell scripting
- ✓ Ansible vs Chef vs Puppet
- ✓ History of configuration management

4.2 Ansible Basics

- ✓ Installation & version history
- ✓ Inventory management best practices
- ✓ Modules vs Collections
- ✓ ADHOC commands & SSH credentials

4.3 Ansible Playbooks

- ✓ XML vs JSON vs YAML
- ✓ DEBUG module
- ✓ Plays, multi-play playbooks, tasks

4.4 Variables

- ✓ Play-level, task-level, inventory, CLI variables
- ✓ Variable precedence

4.5 Roles & Advanced Concepts

- ✓ Role directory structure & best practices
- ✓ Ansible Galaxy
- ✓ Unified pull/push playbook
- ✓ files, meta, templates directories
- ✓ Conditions & loops

4.6 Ansible Ecosystem

- ✓ Ansible Tower/AWX
- ✓ GUI open source tools

MODULE 05

Terraform — Infrastructure as Code + Packer

Week 5

5.1 Introduction to IaC

- ✓ Advantages, alternatives, why Terraform

5.2 Terraform Language & Lifecycle

- ✓ HCL introduction, code structure, file extensions
- ✓ Installation
- ✓ Lifecycle: init, plan, apply, destroy

5.3 Variables & Functions

- ✓ Output block, inbuilt functions
- ✓ Variable block: tfvars, auto tfvars
- ✓ Variable precedence

5.4 Resources & Providers

- ✓ Resource block: attributes & arguments
- ✓ Provider block, data sources
- ✓ Resource reference

5.5 Loops & Inputs

- ✓ count, for_each
- ✓ Best input methods

5.6 State Management

- ✓ State file best practices
- ✓ Remote state backends

5.7 Modules & Conditions

- ✓ Local & vendor modules
- ✓ Module best practices
- ✓ Locals, conditions

5.8 Project Structure & Testing

- ✓ Versioning, multi-environment structure
- ✓ Best practices for real-time environments
- ✓ Terraform test cases

5.9 Packer for Azure VM Image Building NEW

- ✓ Introduction to Packer
- ✓ Packer templates for Azure VM Images
- ✓ Integration with Terraform

MODULE 06

Docker — Containerization

Week 6

6.1 Container Fundamentals

- ✓ Physical Server vs Virtual Server vs Container
- ✓ Container management software types
- ✓ Container advantages & adoption

6.2 Docker Introduction

- ✓ Docker architecture, ecosystem history
- ✓ Public Docker images
- ✓ Container runtimes

6.3 Docker Images & Dockerfiles

- ✓ Dockerfile instructions: FROM, RUN, COPY, ADD, CMD, ENTRYPOINT
- ✓ Building images, image layers
- ✓ Compare Docker image with Azure VM Image
- ✓ ADD vs COPY, CMD vs ENTRYPOINT
- ✓ Multi-stage builds NEW

6.4 Docker Registries

- ✓ Public vs private registries
- ✓ Introduction to ACR
- ✓ Building images in pipelines
- ✓ Pushing to registry
- ✓ Push Images to ACR

6.5 Running Containers

- ✓ Dynamic & static ports
- ✓ Health checks
- ✓ Volume mapping (single & multiple)
- ✓ Container inspection & management

MODULE 07

Kubernetes + Helm + Kustomize + ISTIO

Week 7–8

7.1 Kubernetes Fundamentals

- ✓ Orchestration introduction & importance
- ✓ Pod advantages
- ✓ kubeconfig, Minikube setup
- ✓ Kubernetes vs Docker
- ✓ Architecture overview
- ✓ Kubernetes YAML

7.2 Core Objects

- ✓ Pods: single/multi-container, labels, annotations, env vars
- ✓ ReplicaSet & Deployment
- ✓ ConfigMaps & Secrets
- ✓ Services: ClusterIP, LoadBalancer, NodePort

7.3 Kubernetes on Azure (AKS)

- ✓ AKS introduction & Terraform configuration
- ✓ OIDC in AKS, Node Pools, kubeconfig

7.4 Advanced Concepts

- ✓ Namespaces
- ✓ Service Accounts & Managed Identities
- ✓ Nginx Ingress Controller
- ✓ Azure Key Vault integration
- ✓ Load Balancer exposure from AKS
- ✓ Prometheus & Grafana on AKS

7.5 Karpenter / AKS Node Autoscaler — Node Autoscaling NEW

- ✓ Karpenter vs Cluster Autoscaler
- ✓ Node consolidation strategies
- ✓ Provisioner configuration

7.6 Resource Management NEW

- ✓ Requests & Limits
- ✓ Vertical Pod Autoscaler (VPA)
- ✓ Horizontal Pod Autoscaler (HPA)
- ✓ Pod Disruption Budgets

7.7 Kubernetes Gateway API NEW

- ✓ Gateway API vs Ingress
- ✓ Traffic splitting & canary patterns
- ✓ HTTPRoute, GRPCRoute

7.8 Helm Charts

- ✓ What is Helm? Architecture
- ✓ Creating charts from scratch
- ✓ Helm repositories & best practices
- ✓ Chart structure: Chart.yaml, values.yaml, templates
- ✓ Installing, upgrading, rolling back releases

7.9 Kustomize NEW

- ✓ Kustomize vs Helm
- ✓ Integration with ArgoCD
- ✓ Overlays for multi-environment management

7.10 Service Mesh — ISTIO & Cilium

- ✓ Why service mesh for microservices
- ✓ TLS configuration, traffic management, observability
- ✓ ISTIO vs Cilium vs Linkerd comparison
- ✓ ISTIO sidecar injection (Envoy Proxy)
- ✓ Cilium — eBPF-based service mesh (industry trend) NEW

MODULE 08

Monitoring & Observability

Week 9

8.1 Prometheus

- ✓ Monitoring & alerting importance
- ✓ Exporters: Node Exporter, cAdvisor
- ✓ PromQL basics
- ✓ Service discovery methods
- ✓ Prometheus architecture: scrape, store, query
- ✓ Target configuration
- ✓ Alertmanager configuration

8.2 Grafana

- ✓ Data visualization importance
- ✓ Building dashboards & panels
- ✓ Templating with variables
- ✓ Configuring data sources
- ✓ Visualization types
- ✓ Alerting setup

8.3 ELK Stack

- ✓ Centralized logging need
- ✓ Logstash: inputs, filters, outputs
- ✓ Use cases: troubleshooting, security analysis, performance
- ✓ Elasticsearch: index, document, shard, replica
- ✓ Kibana: discover, visualizations, dashboards

8.4 OpenTelemetry (OTEL) NEW

- ✓ Introduction to OpenTelemetry standard
- ✓ OTEL Collector deployment
- ✓ Integration with Prometheus & Grafana
- ✓ Traces, Metrics, and Logs unified
- ✓ Instrumenting applications

8.5 NewRelic

- ✓ APM introduction
- ✓ Agent integration
- ✓ Troubleshooting with NewRelic
- ✓ Key features: APM, infra monitoring, log management
- ✓ Custom dashboards & alerts

● 8.6 Fluent Bit / Fluentd NEW

- ✓ Modern log collection for Kubernetes
- ✓ Fluent Bit vs Logstash comparison
- ✓ Deploying as DaemonSet on AKS

● 8.7 SRE Practices NEW

- ✓ SLIs, SLOs, and Error Budgets
- ✓ Incident management & on-call
- ✓ Post-mortems & blameless culture
- ✓ Toil reduction strategies

MODULE 09

GitOps & CI/CD — ArgoCD

Week 10

● 9.1 ArgoCD

- ✓ What is GitOps? Architecture
- ✓ Installing ArgoCD in AKS
- ✓ Configuring ArgoCD
- ✓ Projects, YAML code, sync policies
- ✓ Best practices

● 9.2 Advanced CI/CD Patterns NEW

- ✓ Blue-green deployments
- ✓ Canary deployments
- ✓ Progressive delivery
- ✓ Feature flags overview

MODULE 10

Security & Quality

Week 11

● 10.1 SonarQube

- ✓ Continuous integration quality gates
- ✓ Installing SonarQube
- ✓ Sonar client setup, pipeline integration
- ✓ Bugs, vulnerabilities, code smells, coverage, duplication, debt
- ✓ Quality gates & profiles
- ✓ Pipeline failure on quality gate failure

● 10.2 HashiCorp Vault

- ✓ Secrets management use cases
- ✓ Vault CLI & setup
- ✓ KV Secrets, Transit Backend, Dynamic Secrets
- ✓ Authentication & audit logging
- ✓ Integration with projects, CI, CD, Kubernetes

● 10.3 Container & Infrastructure Security

- ✓ Trivy: container image scanning, K8s cluster scanning
- ✓ CIS benchmarks & CVE scanning
- ✓ Lynis: Linux OS hardening & security auditing

● 10.4 Policy as Code — OPA/Gatekeeper NEW

- ✓ Introduction to Open Policy Agent
- ✓ Writing Rego policies
- ✓ Gatekeeper for Kubernetes
- ✓ Enforcing policies in CI/CD and K8s

● 10.5 Software Supply Chain Security NEW

- ✓ SBOM (Software Bill of Materials) generation
- ✓ Dependency vulnerability scanning
- ✓ Image signing with Cosign/Sigstore
- ✓ SLSA framework overview

● 10.6 SAST/DAST Concepts NEW

- ✓ Static Application Security Testing
- ✓ CheckMarx SAST — static code analysis
- ✓ Integration in CI/CD pipelines
- ✓ Dynamic Application Security Testing
- ✓ CheckMarx SCA — software composition analysis

● 10.7 Service Mesh & Network Security NEW

- ✓ mTLS for service-to-service communication
- ✓ Web Firewall (Azure WAF) integration

MODULE 11

Python for DevOps

Week 12

● 11.1 Python Fundamentals

- ✓ History, versions (V2 vs V3), use cases
- ✓ Operators and expressions
- ✓ Indentation, variables, data types

● 11.2 Control Flow

- ✓ Conditions (if/elif/else)
- ✓ Loops (for, while), comprehensions

● 11.3 Functions

- ✓ Parameters, arguments, return values
- ✓ Recursive functions
- ✓ Scope and lifetime, doc strings, annotations

11.4 Data Structures

- Lists, Tuples, Dictionaries, Sets

11.5 Strings & Regular Expressions

- String manipulation, regular expressions

11.6 Modules for DevOps

- OS, Platform, Subprocess, Sys, Psutil modules
- Requests, Logging, Paramiko, Azure SDK for Python (azure-mgmt, azure-identity)
- Running Azure Functions with Python code

MODULE 12

AI for DevOps & AIOps ENTIRELY NEW

Week 13

12.1 AI-Assisted DevOps Workflows

- GitHub Copilot for Infrastructure as Code
- AI-assisted Terraform, Ansible, and K8s manifest generation
- Prompt engineering for DevOps automation
- AI-powered code review and testing

12.2 AIOps — Intelligent Operations

- Introduction to AIOps concepts
- AI-driven anomaly detection in monitoring
- Predictive alerting and auto-remediation
- Noise reduction in alert management
- ChatOps with AI assistants

12.3 LLM Infrastructure for DevOps

- Overview of deploying AI/ML models on Kubernetes
- GPU node management on AKS
- Model serving concepts (vLLM, TGI overview)
- Resource management for AI workloads

12.4 MLOps Pipeline Fundamentals

- CI/CD for ML models overview
- Model registries and versioning
- A/B testing for model deployments
- Monitoring ML model performance

MODULE 13

Capstone Project & Interview Prep

Week 14

13.1 End-to-End Project Implementation

- ✓ Complete microservices deployment on Azure
- ✓ Monitoring and observability setup
- ✓ Full CI/CD pipeline with security gates
- ✓ GitOps-based deployment

13.2 Real-World Troubleshooting Scenarios NEW

- ✓ Pod in CrashLoopBackOff — systematic debugging approach
- ✓ CI/CD pipeline failure — build, test, deploy stage debugging
- ✓ 503 Service Unavailable — tracing from App Gateway to pod
- ✓ Kubernetes node NotReady — kubelet, resource, networking diagnosis
- ✓ ArgoCD out-of-sync — drift detection & resolution
- ✓ Terraform apply fails — state lock, drift, dependency issues
- ✓ Production CPU/Memory spike — identifying & resolving root cause
- ✓ Docker image build failure — layer caching, multi-stage issues
- ✓ Secrets leaked in Git — remediation & prevention with Vault
- ✓ Prometheus alerts firing false positives — tuning thresholds & SLOs

13.3 Interview Preparation

- ✓ DevOps scenario-based questions
- ✓ Mock interviews with real-time feedback
- ✓ Architecture design discussions
- ✓ Resume review & ATS optimization

13.4 Certification Roadmap

- ✓ Microsoft Azure Administrator (AZ-104) — syllabus covers 80%+ topics
- ✓ Certified Kubernetes Administrator (CKA) — syllabus covers 85%+ topics
- ✓ Guidance on exam registration, study resources & preparation strategy
- ✓ Azure DevOps Engineer Expert (AZ-400) — syllabus covers 75%+ topics
- ✓ HashiCorp Terraform Associate — syllabus covers 90%+ topics