# DevOps Engineer Professional Training Program with Cloud Technologies

## Course Overview

This comprehensive DevOps Engineer program focuses on modern DevOps methodologies that bridge software development, operations, quality assurance, and business value delivery. Students gain hands-on experience across the full software development lifecycle, from design and architecture through CI/CD, release management, and production operations. The program emphasizes Infrastructure as Code, Kubernetes, and public cloud platforms, aligned with current industry practices.

## Learning Methodology

The program follows a Project-Based Learning (PBL) model. Students work in small teams on guided projects, supported by instructors and industry mentors. Learning combines theoretical lectures, hands-on labs, simulations, and independent study.

## Program Details

1. Total Hours: 407 (307 academic hours + 100 hours of independent project work)
2. Target Audience: Software developers, automation developers, and IT professionals with Linux and scripting experience
3. English proficiency required (internal placement test)
4. Final certificate awarded upon successful completion with at least 85% attendance

## Minimum Hardware Requirements

1. 512GB SSD storage
2. 16GB RAM
3. Intel i5 (8th generation or higher) or equivalent
4. 14-inch display or larger

## Curriculum Modules

**Module 1 – Introduction to DevOps (4h)**

Virtualization setup using VMware, VirtualBox, or Hyper-V.

**Module 2 – Linux (24h)**

Linux OS concepts, kernel, storage, networking, permissions, shell scripting, monitoring.

**Module 3 – Networking (8h)**

OSI model, TCP/IP, DNS, DHCP, HTTP, CLI networking tools.

**Module 4 – Cryptography (4h)**

Encryption, SSH, hashing, PKI, certificates.

**Module 5 – Version Control (8h)**

Git, GitHub, branching strategies, Git Flow, rebase, pull requests.

**Module 6 – Web Servers (4h)**

Nginx, Apache, SSL with Let's Encrypt.

**Module 7 – Virtualization & Computing (4h)**

CPU and memory virtualization, hypervisors.

**Module 8 – Python Scripting (24h)**

Python syntax, OOP, APIs, JSON, regex, argparse, lambda, complexity.

**Module 9 – Containers (20h)**

Docker, Podman, Docker Compose, container lifecycle, security.

**Module 10 – DevOps Methodologies (4h)**

CI/CD, Agile, Scrum, Kanban, microservices, business impact.

**Module 11 – Jenkins (12h)**

Pipelines, agents, shared libraries, plugins.

**Module 12 – GitHub Actions (12h)**

Workflows, jobs, runners, events.

**Module 13 – Artifact Repositories (4h)**

Nexus, Artifactory, SonarQube, SCA.

**Module 14 – Kubernetes (40h)**

Architecture, pods, services, networking, Helm, storage, best practices.

**Module 15 – Advanced Kubernetes (8h)**

Service mesh, network policies, operators, CRDs.

**Module 16 – AWS (40h)**

VPC, EC2, IAM, S3, EKS, HA/DR, monitoring, security.

**Module 17 – GitOps (8h)**

ArgoCD, Spinnaker, Flux.

**Module 18 – Infrastructure as Code (24h)**

Terraform, Ansible, CloudFormation, CDK.

**Module 19 – Observability (20h)**

Prometheus, Grafana, ELK stack.

**Module 20 – MLOps (4h)**

AI for DevOps, MLflow, APIs.

**Module 21 – GenAI for DevOps (8h)**

Prompt engineering, RAG, GitHub Copilot, Amazon Q.

**Module 22 – Final Project (8h)**

Industry-grade end-to-end DevOps project.