



SAI TECH ACADEMY

AWS CLOUD & DEVOPS ENGINEER MASTERY PROGRAM



Hands-On Learning
Real-Time Projects
From Beginner to
Industry-Ready
Professional



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Course Overview

DevOps Engineering Training is a comprehensive, industry-focused program designed for beginners, system administrators, support engineers, software developers, and aspiring DevOps professionals. The course covers SDLC, Git, Maven, Jenkins, Terraform, Ansible, Docker, Kubernetes, CI/CD, Infrastructure Automation, and Cloud-native deployment practices through hands-on learning and real-world implementation scenarios.

Course Objectives

By the end of this course, participants will be able to:

- Understand DevOps culture and practices
- Learn SDLC, Agile, and CI/CD methodologies
- Manage source code using Git
- Build applications using Maven
- Configure CI pipelines using Jenkins
- Provision infrastructure using Terraform
- Automate deployments using Ansible
- Containerize applications using Docker
- Orchestrate applications using Kubernetes
- Implement end-to-end DevOps automation workflows

Course Modules

- Introduction to DevOps
- Version Control with Git
- Linux Fundamentals
- Cloud Computing Fundamentals
- Build Automation with Maven
- Continuous Integration with Jenkins
- Infrastructure as Code with Terraform
- Configuration Management with Ansible
- Containerization with Docker
- Container Orchestration with Kubernetes

Course Syllabus

Module 1: Introduction to DevOps

DevOps Fundamentals

- What is DevOps
- History of DevOps
- DevOps Definition
- Benefits of DevOps
- DevOps Lifecycle
- DevOps Culture and Collaboration

Hands-on Lab

- Understanding Agile Workflow
- CI/CD Lifecycle Demonstration
- DevOps Toolchain Overview

Software Development Life Cycle (SDLC)

- Introduction to SDLC
- Waterfall Model
- Agile Model
- Scrum Fundamentals
- Continuous Integration (CI)
- Continuous Delivery (CD)
- Continuous Deployment
- CI/CD Pipeline Overview

Module 2: Version Control with Git

Git Fundamentals

- Version Control System
- Centralized Version Control System
- Distributed Version Control System
- Git Features

Git Operations

- Git Clone
- Git Add
- Git Commit
- Git Push
- Git Pull
- Git Fetch

Advanced Git

- Git Stash
- Git Reset
- Git Checkout
- Git Tags
- Git Branch Strategy

Git Installation & Configuration

- Installing Git
- Git Configuration
- Creating Repositories

Branching & Collaboration

- Branch Creation
- Branch Management
- Git Merge
- Git Rebase
- Conflict Resolution

Hands-on Lab

- Create Repository
- Clone Repository
- Branch Creation & Merge
- Conflict Resolution
- GitHub Integration

Module 3: Linux Fundamentals

- Introduction to Linux
- Linux Architecture and Distributions
- Linux File System
- Essential Linux Commands
- File and Directory Management
- User and Group Administration
- File Permissions and Ownership
- Process Management
- Package Management
- Linux Networking Fundamentals
- Service Management
- Web Server Configuration
- Shell Scripting Basics

Module 4: Cloud Computing Fundamentals

- What is Cloud Computing?
- Cloud Service Models (IaaS, PaaS, SaaS)
- Public, Private, and Hybrid Cloud
- Benefits of Cloud Computing
- Introduction to AWS
- AWS Global Infrastructure
- Regions and Availability Zones
- AWS Free Tier Account Setup

Identity and Access Management (IAM)

- AWS Account Structure
- Root User vs IAM User
- Users, Groups, and Roles
- IAM Policies and Permissions
- Multi-Factor Authentication (MFA)
- IAM Security Best Practices
- AWS CLI Configuration

Amazon EC2 (Elastic Compute Cloud)

- EC2 Fundamentals
- Instance Types and Pricing Models
- Amazon Machine Images (AMI)
- Key Pairs and Secure Access
- Security Groups
- User Data and Metadata
- Elastic IP Addresses
- Placement Groups
- Network Interfaces
- Launch Templates
- EBS Volumes and Snapshots
- Custom AMI Creation

Amazon VPC & Networking

- VPC Fundamentals
- CIDR and IP Addressing
- Public and Private Subnets
- Internet Gateway (IGW)
- NAT Gateway and NAT Instance
- Route Tables
- Network ACLs
- Security Groups
- Bastion Host
- VPC Flow Logs
- VPC Peering
- Transit Gateway
- VPC Endpoints
- Site-to-Site VPN
- Customer Gateway and Virtual Private Gateway

AWS Storage Services

- Amazon S3
- Buckets and Objects
- Storage Classes
- Versioning
- Lifecycle Management
- Cross-Region and Same-Region Replication
- Encryption and KMS
- Pre-Signed URLs
- Static Website Hosting
- Event Notifications
- Access Points
- Amazon EBS
- Volume Types
- Snapshots
- Performance Optimization
- Volume Management

Amazon EFS (Elastic File System)

- EFS Architecture and Benefits
- EFS vs EBS vs S3
- Creating and Configuring EFS
- Mount Targets and Security Groups
- Mounting EFS on EC2 Instances
- Shared File Storage Across Multiple Instances
- Performance and Throughput Modes
- Backup and Data Protection

Load Balancing & Auto Scaling

Elastic Load Balancer (ELB)

- Application Load Balancer (ALB)
- Network Load Balancer (NLB)
- Target Groups
- Listener Rules
- Health Checks

Auto Scaling

- Auto Scaling Groups (ASG)
- Scaling Policies
- Scheduled Scaling
- Dynamic Scaling
- Instance Warm-Up and Cool-Down

Amazon Route 53

- DNS Fundamentals
- Hosted Zones
- Record Types
- Routing Policies
- Health Checks
- Failover Routing
- Latency-Based Routing
- Multi-Region Architectures

Amazon RDS

(Relational Database Service)

- Database Fundamentals
- RDS Architecture
- Database Engine Selection
- Storage and Backup Management
- Read Replicas
- Multi-AZ Deployments
- Monitoring and Maintenance

AWS Systems Manager (SSM)

- Introduction to AWS Systems Manager
- Session Manager
- Run Command
- Patch Manager
- Parameter Store
- Automation Documents
- Inventory Management
- State Manager
- Operational Best Practices

AWS Secrets Manager

- Introduction to Secrets Management
- Storing and Managing Secrets
- Automatic Secret Rotation
- Integration with RDS and Lambda
- Access Control Using IAM
- Encryption with AWS KMS
- Security Best Practices

Module 15: Amazon CloudWatch & SNS

- Amazon CloudWatch
- Metrics and Dashboards
- Log Monitoring
- CloudWatch Alarms
- Amazon SNS
- Topics and Subscriptions
- Email Notifications
- Event-Based Notifications

Module 16: AWS Lambda (Serverless Computing)

- Introduction to Serverless Architecture
- Lambda Functions
- Event-Driven Computing
- Lambda Layers
- Environment Variables
- Boto3 Automation
- AWS Service Integrations
- Lambda Best Practices

Module 5: Build Automation with Maven

Maven Fundamentals

- Introduction to Build Automation
- ANT vs Maven
- Maven Architecture

Maven Project Structure

- POM (pom.xml)
- Maven Dependencies
- Dependency Management

Maven Repositories

- Local Repository
- Central Repository
- Remote Repository

Hands-on Lab

- Maven Installation
- Java Project Build
- Dependency Management
- Artifact Packaging

Maven Installation

- Installing Maven
- Environment Setup
- Build Requirements

Maven Build Lifecycle

- Validate
- Compile
- Test
- Package
- Install
- Deploy

Maven Plugins

- Plugin Management
- Artifact Generation

Module 6: Continuous Integration with Jenkins

Jenkins Fundamentals

- Introduction to Jenkins
- Continuous Integration Concepts
- Jenkins Architecture

Jenkins Setup

- Jenkins Installation
- Jenkins Configuration
- Jenkins Dashboard

Jenkins Jobs

- Freestyle Jobs
- Pipeline Jobs
- Build Triggers
- Scheduling Jobs

Jenkins Integration

- Git Integration
- Maven Integration
- Automated Build Process

Jenkins Pipeline

- Pipeline as Code
- Declarative Pipeline
- Scripted Pipeline

Jenkins Administration

- Master-Agent Architecture
- Workspace Management
- Jenkins Plugins
- Backup & Restore
- Security Configuration

Hands-on Lab

- Install Jenkins
- Create Freestyle Project
- Git Integration
- Maven Build Automation
- Jenkins Pipeline Creation

Module 7: Infrastructure as Code with Terraform

Terraform Fundamentals

- Introduction to IaC
- What is Terraform
- Terraform Architecture

Terraform Syntax

- Variables
- Outputs
- Providers
- Resources
- Interpolation

AWS Provisioning

- EC2 Provisioning
- Security Groups
- Infrastructure Automation

Terraform Basics

- Terraform Installation
- Terraform Workflow
- Terraform Configuration Files

Terraform CLI

- Terraform Init
- Terraform Plan
- Terraform Apply
- Terraform Destroy
- Terraform Console

Hands-on Lab

- Install Terraform
- Launch EC2 Instance
- Configure Security Groups
- Infrastructure Deployment Automation

Module 8: Configuration Management with Ansible

Ansible Fundamentals

- Introduction to Ansible
- Configuration Management Concepts
- Ansible Architecture

Inventory Management

- Static Inventory
- Dynamic Inventory
- Host Groups

Automation

- Ad-Hoc Commands
- Playbooks
- Modules

Installation & Configuration

- Ansible Installation
- Ansible Server Configuration
- ansible.cfg Configuration

YAML Fundamentals

- YAML Syntax
- YAML Data Types

- Variables
- Roles

Hands-on Lab

- Configure Ansible Server
- Create Inventory
- Run Ad-Hoc Commands
- Deploy Applications Using Playbooks

Module 9: Containerization with Docker

Docker Fundamentals

- Introduction to Containers
- Virtual Machines vs Containers
- Docker Architecture

Docker Images

- Docker Images
- Image Management
- Building Custom Images

Dockerfile

- Dockerfile Instructions
- Custom Image Creation

Docker Registry

- Docker Hub
- Docker Trusted Registry

Hands-on Lab

- Build Docker Images
- Run Containers

Docker Setup

- Docker Installation
- Docker CLI

Docker Containers

- Container Lifecycle
- Networking
- Volumes

Docker Compose

- Multi-Container Applications
- Compose Files

Docker Swarm

- Swarm Cluster
- Service Deployment

- Create Dockerfile
- Deploy Multi-Container Application

Module 10: Container Orchestration with Kubernetes

Kubernetes Fundamentals

- Introduction to Kubernetes
- Why Kubernetes
- Kubernetes Architecture

Kubernetes Objects

- Pods
- ReplicaSets
- Deployments
- Services
- Namespaces

Cluster Components

- Control Plane
- Worker Nodes
- ETCD
- API Server
- Scheduler
- Controller Manager

Storage & Configuration

- Volumes
- Persistent Volumes
- ConfigMaps
- Secrets

Administration

- Kubectl Commands
- Scaling Applications
- Rolling Updates
- Rollbacks
- Troubleshooting

End-to-End DevOps Project Implementation

- Source Code Management using Git
- Application Build using Maven
- Continuous Integration using Jenkins
- Infrastructure Provisioning using Terraform
- Configuration Management using Ansible
- Containerization using Docker
- Container Orchestration using Kubernetes
- Complete CI/CD Pipeline Implementation
- Production Deployment and Troubleshooting

Networking

- Cluster Networking
- Service Types
- Ingress Controller

Hands-on Lab

- Create Kubernetes Cluster
- Deploy Application
- Configure Services
- Configure ConfigMaps & Secrets
- Application Scaling

Interview Preparation Topics

- DevOps Fundamentals and Lifecycle
- Git Commands and Branching Strategies
- Maven Build Lifecycle
- Jenkins Architecture and Pipelines
- Terraform State and Infrastructure as Code
- Ansible Playbooks, Roles and Modules
- Docker Architecture and Networking
- Kubernetes Objects and Troubleshooting
- Scenario-Based DevOps Interview Questions

THANK YOU

Empowering the next generation of Cloud & DevOps Professionals through hands-on learning, real-world projects, and industry-focused training.

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For course inquiries, admissions, and support, please contact us:

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