Masters Program in AWS DevSecOps

amazon cloudfront

amazon web services™

aws

Amazon EC2

Amazon RDS

AWS FIREWALL MANAGER

Amazon EBS

AWS Identity and Access Management (IAM)

Amazon CloudWatch

AWS Security Hub

Amazon S3

Elastic Load Balancing

Amazon Route 53

Amazon VPC

Elastic IP

Amazon ECR

Amazon EKS

Elastic Beanstalk

Amazon Lambda

amazon SNS

AWS Autoscaling

VPC Flow Logs

Amazon SQS

Terraform
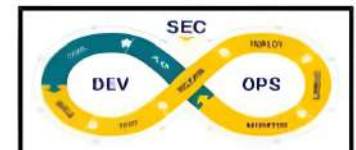
git GitHub

docker

kubernetes

Grafana Prometheus

ANSIBLE

MLOps

AIOps

SEC
DEV OPS

Address: HIG-247, 2nd floor, Road no 2, Opp: Bank of Baroda, KPHB Phase 1& 2, Kukatpally, Hyderabad, Telangana 500072

AWS & DevSecOps Course Content

DevOps Overview

- Evolution of Waterfall, Agile, and DevOps
- What is DevOps?
- Why DevOps?
- Benefits of DevOps
- DevOps Stages
- DevOps Lifecycle
- Various Automation in DevOps
- Overview of CI/CD

Linux Fundamentals

- Overview of Linux
- Linux Architecture
- Linux Distributions
- Basic Linux Commands
- File Permission Management
- User Creation
- Shell Scripts
- Monitoring Commands
- System Information Commands
- Package Commands
- SSH and Vi Utility

AWS Fundamentals

- Fundamentals of Cloud Computing
- Introduction to Cloud Computing
- Revolution in Cloud Computing
- Cloud Computing Models
- Cloud Computing Characteristics
- Understanding Physical and Virtual Servers
- Overview of Public/Private Cloud Computing
- Overview of AWS, Azure, and GCP
- Benefits of Cloud Computing
- Pricing and Usage Policy

AWS Services

- IAM Service
- EC2 Service
- RDS Service
- Cloud Storages
- Public and Private IPs
- Elastic IP

- Cloud Front
- ELB(Elastic Load Balancer)
- SNS
- SQS
- Cloud Watch
- KMS
- Route 53
- EKS and ECS
- EBS
- EFS
- Auto Scaling
- VPC
- VPC Peering
- VPC Endpoint
- Transit Gateway
- Firewall (including WAF Firewall)
- Elastic Beanstalk
- Server less Architecture (AWS Lambda)
- Types of API
- Creating HTTP API in API Gateway
- API Gateway Endpoints

Infrastructure & Networking

- Introduction to AWS
- AWS Global Infrastructure
- Setting up AWS Account
- Key-based Authentication
- Creating the First Private Key Pair
- Launching the First EC2 Instance
- Connectivity Options for Servers
- Connection to EC2 Using Browser
- Setting up SSH Client
- Basic Firewalls
- EC2 Pricing Considerations
- Terminating EC2 Instances

VPC (Virtual Private Cloud)

- Understanding VPC
- Creating VPC and Subnets
- Internet Gateway and Route Tables
- NAT Gateway
- NACL (Network Access Control List)
- Security Groups

Domain Name System (DNS)

- Introduction to DNS
- Traffic Packet Capture of DNS Package
- Understanding DNS Records

- o A Records
- o 4S Records
- Introduction to Route 53
- Creating Hosted Zones in Route 53
- CNAME Records
- Route 53 Health Check
- Using Certificates with ACM
- Content Delivery Network (CDN)
  - o Understanding Content Delivery
  - o Demo: CloudFront CDN
- Understanding Edge Locations
- Deploying CloudFront Distribution

Advanced Cloud Concepts

- Load Balancing (Application, Network and Gateway Load Balancers)
- Auto Scaling Groups (ASG)
- Amazon Relational Database Service (RDS)
- Amazon S3 (Object Storage, Versioning, Lifecycle Policies)
- Amazon IAM (Policies and Roles)
- Monitoring with AWS CloudWatch
- Logging with AWS CloudTrail

Infrastructure as Code (IaC) with Terraform

- Introduction to Infrastructure as Code
- Why Terraform?
- Installation and Configuration of Terraform
- Terraform Providers
- Writing Terraform Configuration Files
- Managing Terraform State
- Terraform Modules
- Using Variables and Outputs in Terraform
- Creating Resources on AWS Using Terraform
- Terraform Commands
- Working with Remote Backends
- Terraform Workspaces
- Managing Multiple Environments

DevSecOps

Managing Source Code – Git and GitHub

- Overview of Version Control Systems
- Central vs. Distributed Version Control Systems
- Introduction to Git
- Installation and Setup of Git
- Important Git Commands
- Creating and Managing Git Repositories
- Branching, Merging, Stashing, Rebasing, Reverting, and Resetting
- Introduction to GitHub

- Managing Remote Repositories

Understanding and Using Build Tools

- Overview of Various Build Tools
- Introduction to Maven
    - Maven Architecture
    - Maven Plugins
    - Maven Archetypes
    - Maven Commands
- NPM Build Tool
- PIP Build Tool

Continuous Integration Using Jenkins

- Overview of Continuous Integration
- Differences Between Continuous and Traditional Integration
- Introduction to Jenkins
- Jenkins Master-Slave Architecture
- Jenkins Installation and Configuration
- Jenkins Plugins
- Jenkins Management
- Jenkins Freestyle and Pipeline Jobs
- Scripted and Declarative Pipelines
- Configuring Slave Nodes in Jenkins
- Conditional Statements in Pipelines:
    - When Condition
    - Post Condition
    - If Condition
- Email Integration
- Environment Variables
- Triggering Pipelines Using Jenkins

SonarQube

- Introduction to SonarQube
- SonarQube Installation and Configuration
- Adding Users and Groups in SonarQube Dashboard
- Integrating SonarQube with Jenkins
- Understanding Quality Gates and Quality Profiles

Nexus

- Introduction to Nexus
- Installation and Configuration of Nexus
- Setting Up Nexus Repository
- Integrating Nexus with Jenkins
- Creating Private Repositories

Containerization with Docker and Docker Hub

- Introduction to Virtualization and Containerization
- Docker Architecture
- Overview of Docker Hub
- Docker Installation
- Docker Commands
- Container Modes and Port Binding
- Writing Dockerfiles
- Managing Docker Images and Containers
- Docker Volume
- Docker Compose
- Tools: **Docker Scout and Docker Trivy**

Orchestration with Kubernetes (K8s)

- Introduction to Kubernetes
- Kubernetes Architecture
- Overview of Master and Worker Nodes
- Installation of Minikube and kubectl
- Kubernetes Components:
    - Pods
    - ReplicaSets
    - Deployments
    - Namespaces
    - Services (ClusterIP, NodePort, LoadBalancer)
    - ConfigMaps
    - Secrets
    - Persistent Volumes (PVs) and Persistent Volume Claims (PVCs)
- Kubernetes Networking Concepts
- Rolling Updates and Rollbacks
- Horizontal Pod Autoscaler (HPA)
- Monitoring Kubernetes with Metrics Server
- Helm Charts

Ansible for Configuration Management

- Introduction to Ansible
- Understanding Agentless Architecture
- Installing Ansible
- Ansible Inventory Files
- Writing Ansible Playbooks and Roles
- Ansible Variables and Templates
- Ansible Modules
- Ad-hoc Commands vs. Playbooks
- Configuring EC2 Instances Using Ansible
- Ansible Galaxy and Collections

Monitoring and Logging with Prometheus and Grafana

- Introduction to Monitoring and Logging
- Overview of Prometheus Architecture
- Installing and Configuring Prometheus

- Prometheus Metrics and Alerts
- Introduction to Grafana
- Installing and Configuring Grafana
- Connecting Grafana to Prometheus
- Creating Dashboards in Grafana
- Configuring Alerts in Grafana

Sec Tools

Security

- AWS Security Hub
- AWS Shield
- AWS Inspector
- AWS Secrets Manager
- Amazon Detector
- AWS System Manager

MLOPS

- What is MLOps
- MLFlows Modules
- DVC
- DagsHub
- Airflow
- Amazon Comprehend
- Amazon Translate
- Amazon Textract
- Amazon Lex
- Amazon Transcribe
- Amazon Kendra
- Amazon Rekognation
- Amazon Sagemaker

AIOps

- Amazon Bedrock 7 Generative AI Introduction
- What is Generative AI
- Amazon Bedrock Overview
- Amazon Bedrock Hands on
- Amazon Bedrock Foundation
- Amazon Bedrock Fine Tuning
- Amazon Bedrock FM Evaluation
- Amazon Bedrock RAG & Knowledgr
- Amazon Q
- Amazon Q Business
- Amazon Q App
- Amazon Q Developer
- End to End LLM
- Muti AI Agents with LLM Models
- Prompt Engineering

- Prompt Engineering Hands on
- Prompt Engineering Optimization
- Prompt Engineering Techniques
- Prompt Templates

Real Time Tools

- Connecting with Putty,
- Connecting with Git Bash,
- Connecting with MobaXterm,
- Connecting with VS Code

Real Time Projects

- Project Planning and Requirements Gathering
- Designing Cloud Architecture Using AWS
- Implementing Infrastructure as Code with Terraform and Ansible
- Creating a Comprehensive CI/CD Pipeline
- Deploying Applications Using Jenkins Pipelines
- Containerizing Applications with Docker
- Deploy using Orchestrating with Kubernetes
- Monitoring and Logging Using Prometheus and Grafana