



DEVOPS & AWS

COURSE CURRICULUM

Introduction

1. Software Development Life Cycle (SDLC)
2. Waterfall Model
3. Agile Methodology
4. Scrum Model
5. Sprints
6. DevOps Principles and Practices
7. Where DevOps fits in Software Development Process
8. DevOps Tools and their functionality

Linux and Shell Scripting

1. Introduction of Linux Operating System
2. File Systems and Linux Kernel Concepts
3. Basics of Linux
4. Creating an EC2 instance in AWS
5. Creating a Linux Server in Virtual Machine
6. Linux Basic Commands
7. Linux Advanced Commands and Administration
8. Shell Scripting
9. Types of Shells, Naming Conventions, Permissions
10. Variables, CLA, Escape Characters, Strings, Operators
11. Redirection Concepts, Loops, Functions, Pipe
12. CRON Jobs, Auto Scheduling

Version Controlling: Git and GitHub

1. Version Controlling, Centralized vs Distributed
2. Installation and Configuration
3. Initializing Git functionality on local servers
4. Git SCM, Git Branching,

5. Git Merging, Git Tagging
6. Git Rebase, Stashing, Squash, Rearranging Commit history
7. Branching Strategies
8. Git Administration
9. SSH Key generation, Cloning Repositories
10. Git Pull, Push and Fetch
11. P4Merge tool. Git Diff
12. Git Security

Maven

1. Maven Installation
2. Features and Requirements of Maven
3. Maven pom builds
4. Executing Some examples
5. Maven Build Lifecycle
6. Maven Plugins

SonarQube

1. Intro to SonarQube
2. Architecture and Installation of SonarQube
3. Execute the projects in SonarQube and generate reports
4. Administration activities
5. User creation, Project creation configure email settings etc.,

Apache Tomcat

1. Tomcat Installation on various platforms
2. Difference between web servers and application servers
3. Tomcat Directory Structure
4. Creating users in tomcat and changing the port numbers
5. Starting the server, Stopping, and restarting tomcat services
6. Different Roles in Tomcat
7. Deploying artifacts into tomcat with GUI and Command line

Nexus

1. Installing Nexus
2. Nexus Directory Structure

3. Creating repositories and hosting them
4. Integrate maven with nexus
5. Create users in Nexus
6. Administration activities

Jenkins (CI CD)

1. The Five stages of CICD in detail
 - a. Continuous Download
 - b. Continuous Build
 - c. Continuous Deployment
 - d. Continuous Testing
 - e. Continuous Delivery
2. Install Jenkins and configure Jenkins with plugins
3. Perform Build, configure multiple projects in Jenkins
4. Freestyle projects, pipeline, multibranch pipeline projects
5. Jenkins Administration
6. Creating users, assigning Permissions
7. Jenkins Master Slave Architectures
8. Scheduling Jobs in Jenkins, Poll SCM, Build Triggers
9. Configuring Email Notifications
10. Cat Light Notification System
11. Installing Plugins and maintaining Jenkins Server
12. Build Pipeline Plugin Concepts

Docker

1. Virtualization and Containerization – Differences
2. Docker Introduction - Architecture
3. Docker Installation and Administration
4. Creating Docker Containers (OS, Applications, Databases)
5. Multi Container Architecture in Docker
6. Docker Volumes
7. DockerBuilds
8. Dockerfile concepts
9. Docker Networks
10. Creating customized Registry in Docker

11. Pushing images to Remote Repositories (Public and Private)
12. Docker Swarm (Container Orchestration)
13. Overlay Network
14. Docker Stack

Ansible

1. Configuration Management Intro – Tools, Push and Pull Models
2. Ansible Architecture
3. Ansible Cluster formation, Inventory
4. Ansible Ad-hoc Commands and Modules
5. Ansible Inventory Grouping
6. Ansible Playbooks
7. Ansible Variables (Host Scope and Play Scope)
8. Loops Concepts in Ansible
9. Debug Module in Ansible
10. Ansible Handlers Concepts
11. Ansible Error Handling Concepts
12. Ansible Tagging, Ansible Vault
13. Ansible Docker Automation
14. Ansible Galaxy and Ansible Roles

Kubernetes

1. Kubernetes Introduction, Architecture
2. Different approaches of Setting up Kubernetes Cluster
3. Kubernetes Namespaces
4. Kubernetes Objects
 - Pods
 - ReplicaSets
 - Replication Controllers
 - DaemonSet
 - Deployments
 - Rolling Updates
 - Services
 - Persistent Volumes

- Dynamic Volumes
- HPA (Horizontal Pod Autoscaler)

5. Kubernetes cluster setup in AWS using KOPS,
6. Kubernetes Cluster setup using Terraform
7. Monitor Kubernetes using Prometheus and Grafana
8. Integrate Jenkins using Kubernetes
9. Helm Charts

AWS

1. Introduction to Cloud Computing
2. Cloud Computing Deployment Models
3. Cloud Service Models
4. Amazon Elastic Compute Cloud (EC2)
5. Amazon Simple Storage Service (S3)
6. Elastic Load Balancing (ELB)
7. Identity and Access Management (IAM)
8. Virtual Private Cloud (VPC)
9. Route 53
10. Load Balancers
11. AWS CloudWatch
12. Virtual Private Network (VPN)
13. Simple Email Service (SES)
14. Simple Queue Service (SQS)
15. Simple Notification Service (SNS)
16. CloudFormation
17. Databases

Terraform

1. Infrastructure as Code
2. Why Terraform
3. Variables in Terraform
4. Local and Dynamic Blocks in Terraform
5. Commands in Terraform
6. Remote States in Terraform
7. Connecting Local Machine to Terraform Cloud

8. Modules in Terraform
9. Creating VPC on AWS
10. Creating NAT and internet gateway
11. Creating public and private subnets
12. Creating EC2 instances
13. Configuring S3 Buckets
14. Terraform Plugins
15. Implementing Kubernetes on Terraform

Miscellaneous Concepts

1. Nagios and Prometheus, Grafana
2. Python Docker Automation Concepts
3. JIRA – issue tracking tool
4. Google Cloud – Google Kubernetes Engine
5. Webservers and configurations

Resume Preparation and Creating a DevOps Portfolio

1. Interview Tips and Tricks
2. Explaining projects in interviews based on experience
3. Applying for multiple jobs that fits in to DevOps Category
4. Agile and Scrum Methodologies
5. Entire Project workflow in DevOps