DEVOPS COURSE CONTENT DURATION: 60 hrs

Module 1: INTRODUCTION TO DEVOPS

- What is Devops?
- Why Devops?
- Devops Tools
- CI/CD concepts
- Devops Delivery Pipeline

Module 2: VERSION CONTROL SYSTEM-GIT

- Introduction to VCS
- Types of VCS
- Difference between CVCS and DVCS
- What is GIT
- GIT Architecture
- GIT installation
- Git commands
- Working with GIT
    - Creating repository
    - Cloning repository
    - Committing the changes
    - Fetch, pull and remote
    - Branching
    - Creating the Branches
    - switching the branches

- merging the branches
- git reset
- git rebase
- git stash

➢ Working with GitHub

Module 3: BUILD AUTOMATION TOOL - MAVEN

➢ Introduction to Maven
➢ Installing maven
➢ Working with maven goals and plugins
➢ Hands on maven

Module 4: CONTINUOUS INTEGRATION - JENKINS

➢ what is Jenkins?
➢ Continuous Integration with Jenkins
➢ Java installation and configuration
➢ Exploring Jenkins Dashboard
➢ Jobs
- Creating jobs
- Running the Jobs
- Setting up the global environment variables for Jobs
- Adding and updating Plugins
- Disabling and deleting jobs

➢ Securing Jenkins

- Authorization
- Creating users
- Best Practices for Jenkins

- Plugin Management in Jenkins
- Triggering emails in Jenkins
- Scheduling jobs automatically in Jenkins
- Compile, test and deploy jobs in Jenkins
- Building Delivery Pipeline in Jenkins with java Project
- Master Slave Architecture in Jenkins
- Adding Windows slave and run test job on windows
- Adding Linux slave and configuring the job on linux ec2 instance
- Pipeline as code in Jenkins (jenkinsfile) using groovy script

Module 5: CONTAINERIZATION USING DOCKER

- Introduction
  - What is Docker?
  - what is container?
  - Containerization vs Virtualization
- Docker Fundamentals
- Docker Architecture
- Docker Installation on Linux
- Understanding the Docker components
- Working with Images
- Docker Containers

- Docker Networking
- Docker Files
- Docker Volumes
- Creating our own images
- Building Docker image from Jenkins job
- Automating docker image push to Docker hub from Jenkinsfile
- What is Docker Compose?
- Writing Docker Compose File
- Deploying Microservice app with docker compose
- Configuring volumes with compose file
- Automate deploying from Jenkins Pipeline to EC2 Instance
    - Using docker run
    - Using docker-compose

Module 6: CONFIGURATION MANAGEMENT – ANSIBLE

- Introduction to Ansible
    - what is Ansible
    - Ansible Architecture
    - Push configuration in Ansible
- Installation of Ansible
- Adhoc commands in Ansible
- Playbooks in Ansible
- Roles in Ansible
- Creating our own Roles
- Roles from Ansible Galaxy
- Hands on
- Demo - Deploying docker container with ansible

- Demo – Deploying docker compose with ansible

Module 7: CONTAINER ORCHESTRATOR – KUBERNETES

- Introduction to Kubernetes
- Kubernetes Architecture
- Spinning up a Kubernetes Cluster on AWS
- Exploring your Cluster
- Understanding YAML
- Creating a pod object in kubernetes
- Creating a Deployment in Kubernetes using YAML Preview
- Creating a Service Object in Kubernetes
- Creating Headless service, NodePort, Loadbalancer Services
- Creating Headless service, NodePort, Loadbalancer Services
- Installing Kubernetes Dashboard with Helm
- Using Rolling Updates in Kubernetes
- Blue Green Deployments in Kubernetes
- Creating secrets and configmaps
- Working with daemon sets
- Deploying database application using statefulsets
- Working with Persistent Volumes, Persistent volume claims
- Installing Prometheus and grafana on kubernetes cluster with Helm
- Deploying microservice application using statefulsets and Persistent volumes

Module 8: INFRASTRUCTURE AS CODE WITH TERRAFORM

- Introduction to Terraform

- Install Terraform
- Terraform Providers
- Resources and Data Sources
- Change and destroy terraform
- Terraform state commands
- Complete CI/CD with Terraform
- Terraform integration with docker and ansible

Module 9: CONTINUOUS MONITORING- PROMETHEUS AND GRAFANA

- What is Prometheus?
- Prometheus Architecture
- Prometheus Installation
- Monitoring container metrics with Prometheus
- Prometheus UI
- Monitoring Kubernetes cluster with Prometheus
- Grafana dashboard for Prometheus metrics
- Grafana dashboard for kubernetes clusters

Module 10: INTRODUCTION TO CLOUD COMPUTING

- What is cloud computing?
- Introduction to AWS EC2
- Launching an AWS Ec2 Instance
- Connecting to your ec2 instance
- S3 storage
- Load Balancers and Autoscaling groups

- Elastic Beanstalk

Module 11: AWS CODEPIPELINE

- What is AWS Code Pipeline?
- Creating First Pipeline with s3 buckets
- S3 simple storage service on AWS
- Creating an AWS s3 bucket
- Hosting a static website using Amazon s3
- Triggering the pipeline by updating the source
- Understanding Pipeline details and execution history
- Editing, Triggering and deleting our pipeline

Module 12: AWS CODECOMMIT

- What is AWS Code Commit?
- Creating First Code Commit Repository
- Connecting to our code Commit Repository using HTTPS
- Creating Code Pipeline with Code commit repository as source
- Triggering the pipeline with code commit

Module 13: AWS CODEBUILD

- What is AWS Code Build?
- Creating First Code Build Project
- Creating Pipeline with Build Stage
- Creating Build Spec file for your builds
- Triggering the pipeline with code commit changes

Module 14: AWS CODEDEPLOY

- What is AWS Code Deploy?
- Deployments on EC2 instances using Code Deploy
- Creating an AppSpec file for deployments on EC2 instances
- Creating Deployment group with autoscaling and Load Balancer

Module 15: AWS CLOUDFORMATION

- What is AWS CloudFormation?
- Adding a CloudFormation Deploy Action to your Pipeline
- Adding a Deploy Action to the pipeline
- Adding a manual approval action in the pipeline

Note: Real Project execution on the devops delivery Pipeline with different tools and services on AWS.