DevOps Course Curriculum

Overview of DevOps  
**Goal**: In this module, you will be introduced to the DevOps environment.  
**Objectives**: After completing this module, you should be able to  
Understand the benefits of DevOps over other software development processes  
Gain insights into the DevOps environment  
Get an overview of different DevOps Tools  
Get a picture of the working of the DevOps Delivery Pipeline  
**Topics**:   
Introduction to DevOps  
Benefits of working in a DevOps environment  
DevOps Lifecycle  
DevOps Stages  
DevOps Delivery Pipeline

Version Control with Git  
**Goal**: In this module, you will gain insights into Source Control Management and learn the  
functionalities of Git.  
**Objectives**: After completing this module, you should be able to  
Understand Version Control  
Perform management of files for small as well as large projects  
Perform various Git commands such as git add, git fetch, git commit, git init, etc.  
Work with remote repositories

**Topics:**

Version Control  
Git Introduction  
Git Installation  
commonly used commands in Git  
Working with Remote repository  
**Hands On:**   
Git Common Commands  
Working with Remote Repository

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Git, Jenkins & Maven Integration  
**Goal**: In this module, you will learn about the different actions performed through Git and will be  
introduced to Jenkins and Maven.  
**Objectives**: After completing this module, you should be able to:  
Execute branching and merging operations  
Perform various Git commands  
Understand Maven Architecture and dependencies  
Learn about Continuous Integration & its importance  
Understand Jenkins and its features  
**Topics:**  
Branching and merging in Git  
Merge Conflicts  
Stashing, Rebasing, Reverting and Resetting  
Git Workflows  
Introduction to Maven  
Maven Architecture  
Introduction to Continuous Integration  
Introduction to Jenkins  
**Hands On:**  
Branching and Merging  
Merge Conflicts  
Stashing, Rebasing, Reverting, and Resetting  
Configuring Maven

Continuous Integration using Jenkins  
**Goal**: In this module, learn how to perform Continuous Integration by building applications with the  
help of Maven and create deployment pipelines using Jenkins.  
**Objectives**: After completing this module, you should be able to  
Managing authorization in Jenkins  
Jenkins notification management  
Master-slave architecture in Jenkins  
Add a slave node to Jenkins master  
Build and deploy codes using Jenkins  
Build pipeline plugin in Jenkins  
Use Declarative pipeline in Jenkins  
**Topics:**  
Jenkins Architecture  
Plugin Management in Jenkins  
Jenkins Security Management  
Notification in Jenkins  
Jenkins Master-slave architecture  
Jenkins Delivery Pipeline  
Jenkins Declarative pipeline  
**Hands On:**  
Create pipeline view using DevCompile and QAUnitTest  
Adding Slave node in Jenkins  
Build Pipeline project using Groovy script

Configuration Management Using Ansible  
**Goal**: Learn how to manage and configure your infrastructure using Ansible Ad-Hoc commands,  
Playbooks, and Roles.  
**Objectives**: After completing this module, you should be able to  
Utilize Ansible CLI  
Execute Ansible Ad-Hoc Commands for one-off tasks  
Automate host servers using Ansible Playbooks  
Use Variables in Playbooks  
Using Handlers  
**Topics:**  
Introduction to Configuration Management  
Infrastructure as Code  
Introduction to Ansible  
Ansible Architecture  
Inventory Management  
Ansible Modules  
AD-HOC Commands  
Ansible Playbooks  
Ansible Roles  
**Hands On:**  
Ad-Hoc Commands

Running a Simple Playbook  
Using Variables and handlers  
Using Ansible Roles

Containerization using Docker Part – I  
**Goal**: This module introduces learners to the core concepts and technology behind Docker. Learn in  
detail about containers and various operations performed on them.  
**Objectives**: After completing this module, you should be able to  
Understand Containerization  
Learn the evolution of virtualization to containers  
Understand the Docker Architecture  
Perform Various actions using Docker CLI  
Bind container ports to the Machine ports  
Run containers in different modes  
Write and build a Dockerfile to create a Docker Image  
**Topics:**  
Containerization  
Namespaces  
Docker  
Docker Architecture  
Container Lifecycle  
Docker CLI  
Port Binding  
Detached and Foreground Mode  
Dockerfile  
Dockerfile Instructions  
Docker Image

**Hands On:**  
Docker CLI Commands  
Port Binding  
Starting Containers in Different Modes  
Writing a Dockerfile to Create an Image

Containerization using Docker Part – II  
**Goal**: Learn how to use Docker Hub registry, deploy a multi-tier application using Docker Compose,  
and create a swarm cluster.  
**Objectives**: After completing this module, you should be able to  
Use Docker Hub to store custom Images  
Store data in Container Volumes for persistent storage  
Setup Docker Compose  
Deploy a multi-container application using Docker Compose  
Deploy a Swarm Cluster  
**Topics:**  
Docker Registry  
Container Storage  
Volumes  
Docker Compose  
Docker Swarm  
**Hands On:**  
Setting up Docker Hub  
Docker Volumes  
Installing Docker Compose  
Installing a Multi-Container Application using Compose  
Running Docker in Swarm Mode

Orchestration using Kubernetes Part - I  
**Goal**: In this module, you will learn about Container Orchestration and Basic of container  
management using Kubernetes.  
**Objectives**: After completing this module, you should be able to  
Understand Container Orchestration  
Learn about Kubernetes Core Concept  
Deploy Pods  
Create Deployments to manage Pods  
Launch DaemonSets for Background applications  
Update and Rollback your Deployments  
Scale your containerized Applications  
**Topics:**  
Introduction to Container Orchestration  
Kubernetes Core Concepts  
Understanding Pods  
ReplicaSet and Replication Controller  
Deployments  
DaemonSets  
Rolling Updates and Rollbacks  
Scaling Application  
**Hands On:**  
Kubectl Common Commands  
Deployments  
DaemonSets

Rolling-update and Rollbacks  
Scaling in Kubernetes

Orchestration using Kubernetes Part - II  
**Goal**: Learn and deploy different service discovery mechanisms, utilize Volumes for persistent storage  
and deploy StatefulSets for stateful applications.  
**Objectives**: After completing this module, you should be able to  
Deploy different Kubernetes Services  
Utilize Volumes to store Persistent Data  
Create Persistent Volume Claims to attach volumes to Pods  
Understand Persistent Volume Claims Primitives  
Use Headless Services in Stateful Sets  
Deploy Helm Charts  
**Topics:**  
Services  
Persistent Storage in Kubernetes  
Primitives for PersistentVolumeClaims  
Secrets and ConfigMaps  
Headless Services  
StatefulSets  
Helm Charts  
**Hands On:**  
Deploying Services  
Persistent Volumes and Persistent Volume Claims  
StatefulSets  
ConfigMaps and Secrets

Provisioning using Terraform Part - I  
**Goal**: Learn how to provision and manage infrastructure on a Cloud Platform (AWS) using Terraform  
Configuration Files.  
**Objectives**: After completing this module, you should be able to  
Understand Provisioning using Terraform  
Learn the Difference between Terraform vs Ansible  
Understand Terraform Architecture  
Deploy a Terraform Configuration File  
Use Basic Terraform Commands  
Manage Terraform Resources  
**Topics:**  
Introduction to Terraform  
Terraform vs Ansible  
Terraform Architecture  
Terraform Configuration  
Terraform Common Commands  
Managing Terraform Resources  
**Hands On:**  
Setting Up AWS and Terraform  
Executing a Terraform Configuration  
Managing Terraform Resources  
Referencing Terraform Resources

Provisioning using Terraform Part - II  
**Goal**: Use Terraform State commands to manage the current state of your infrastructure. Deploy a  
fully usable and working infrastructure using Terraform.  
**Objectives**: After completing this module, you should be able to  
Perform Terraform State Commands  
Deploy a Terraform Project on AWS