



IT EDUCATION
CENTRE

DevOps Training



Introduction to DevOps

- ▶ **What is DevOps?**
- ▶ **Why DevOps?**
- ▶ **Principles of DevOps**
- ▶ **History of DevOps**
- ▶ **SDLC models**
- ▶ **Understand Agile Methodology**
- ▶ **Prerequisites for DevOps**
- ▶ **DevOps with Agile using Scrum**
- ▶ **Overview of DevOps Tools**
- ▶ **How to achieve DevOps**
- ▶ **What is Virtualization?**
- ▶ **What is Hypervisor?**
- ▶ **Types of Server Virtualization**
- ▶ **Benefits of Virtualization**
- ▶ **Important Virtualization products**
- ▶ **Create VM's using Hypervisors**

Linux Administration

- ▶ **Linux Introduction**
- ▶ **Linux Installation**
- ▶ **Basic Linux concepts**
- ▶ **Vim Editor**
- ▶ **Process Management**
- ▶ **Controlling Services & Daemons**
- ▶ **SSH with key-based Authentication**
- ▶ **Linux Networking**
- ▶ **System logs management**
- ▶ **Archiving and Copying Files Between Systems**
- ▶ **Package Management**
- ▶ **Cron Jobs Scheduling?**
- ▶ **What is CICD?**

Networking Concepts

- ▶ **Network Fundamental**
- ▶ **Communication Models and Protocols**
- ▶ **IP Addressing and Subnetting**

Introduction to Virtualization

- ▶ Configure Apache server
- ▶ Limiting Network Communication with firewall

Cloud Fundamentals

- ▶ Introduction to Azure and AWS.
- ▶ VM's in AWS and Azure.
- ▶ Create a free tier AWS account
- ▶ Basic Overview of services, AWS Billing and account
- ▶ Virtual Private Cloud:
- ▶ Inter VPC peering

Ec2

- ▶ Instance Purchasing Options
- ▶ Instance Monitoring
- ▶ SNS
- ▶ Cloud Watch
- ▶ IAM
- ▶ Boot Script
- ▶ EBS
- ▶ EFS
- ▶ Snapshot
- ▶ AMI Creation
- ▶ Auto Scaling

Storage

- ▶ Basic Storage introduction
- ▶ Versioning
- ▶ Replication
- ▶ S3 Browser
- ▶ Fast Glacier

Application Server Implementation

- ▶ Need for application and web server
- ▶ Deploy Tomcat server in different environments
- ▶ Setup, configure of Tomcat, Apache.

IDE (VSCode)

- ▶ Introduction to VS Code, Installation.
- ▶ Interface and workspace overview.
- ▶ Extension and customization.
- ▶ Shortcut and settings.
- ▶ VS Code for Web Developers.
- ▶ VS Code Terminal.
- ▶ Python and VS Code.
- ▶ Git and GitHub on VS Code.

GIT

- ▶ **What is a Version Control System?**
(Initialize, Status, Add, Commit, Clone, Pull, Push, Difference, Reset, Log, Show, Tag, Stash, Remove)
- ▶ **Advanced Git operations**
(Branching, Merging, Rebasing, Merge vs Rebase, Conflict resolving, Deleting remote repositories, Fork Operation).
- ▶ **What Is Git?**
- ▶ **Git Installation with Different environments**
- ▶ **Commands and Operations in Git with GitHub**

Build Tool

- ▶ **Maven**
- ▶ **Introduction to maven**
- ▶ **Maven compare with ant and other tools**
- ▶ **Maven setup in multiple environments**
- ▶ **Maven lifecycle**
- ▶ **Maven repository structure**
- ▶ **Real-time maven settings for the project**
- ▶ **Maven structure coding and implementation with Eclipse**

Ansible

- ▶ Introduction to Ansible, Deploying Ansible.
- ▶ Ansible Inventory, Ansible Ad-Hoc Commands.
- ▶ Ansible Architecture.
- ▶ Intro to YAML.
- ▶ Ansible Playbooks, Modules, Variables, Conditions & Loops.
- ▶ Ansible Roles
- ▶ Ansible with AWS, VPC, Ec2.

Docker

- ▶ Introduction to Docker, Installing Docker.
- ▶ Docker Architecture, Container vs VM.
- ▶ Running your first WebApp container in Docker.
- ▶ Docker Networking, DNS config, SSH, etc.
- ▶ Images, Docker hub, Image Layers, Image Tagging,
- ▶ Pushing, Docker File, Customising Images.
- ▶ Docker Volumes: Data Persistence, Bind Mounting.
- ▶ Docker Compose, compose.yml, Image building.
- ▶ Docker Swarm, Implement multi-node Swarm Cluster.
- ▶ Scale-out with Overlay Networking and Routing Mesh,
- ▶ Multi-Node WebApp.
- ▶ Secret storage for Swarm
- ▶ Swarm App Lifecycle.
- ▶ Container Registries.

Kubernetes

- ▶ Introduction to Kubernetes, Deploying Kubernetes,
- ▶ Minikube, Basics of Kubectl.
- ▶ Kubernetes Architecture, Scaling, Labels & Selectors,
- ▶ Health Checking, Web Interface.
- ▶ DNS, Volumes, Secrets, Usage and Resource Monitor,
- ▶ Auto Scaling.
- ▶ HA, Masters, Configuration.

Jenkins

- ▶ Introduction to Jenkins, Installing Jenkins,
- ▶ Overview of Jenkins UI.
- ▶ Jenkins Architecture.
- ▶ Jenkins plugins for Git, GitHub and Maven.
- ▶ Continuous Inspection with Jenkins.
- ▶ Continuous Delivery with Jenkins.
- ▶ Jenkins File: Pipeline as code.
- ▶ Integration with Docker.
- ▶ Distributed Builds

Terraform

- ▶ Introduction to Terraform, Intro to Infra as a Code (IaaS).
- ▶ Installing Terraform, HCL Basics.
- ▶ Terraform Providers, Configuration Directories, Input
- ▶ Variables, Resource Attributes, Dependencies, Output Variables.
- ▶ Introduction to Terraform State.
- ▶ Commands, Mutable and Immutable Infra, Life Cycle Rules,
- ▶ Data Sources, Meta-Arguments, Count, Version Constraints.
- ▶ Terraform with AWS, IAM, S3, DynamoDB, VPC, EC2.
- ▶ Remote State.
- ▶ Terraform Modules
- ▶ Terraform Functions, Conditional Expressions, Workspace.

Jira Bug Tracking Tool

- ▶ Introduction to Jira
- ▶ Scrum introduction with Scrum Roles
- ▶ Jira login and creating projects
- ▶ User creation and deletion
- ▶ Account creation and bug issues checking
- ▶ Standalone Jira vs cloud Jira
- ▶ The workflow of the Scrum process with the project

Monitoring Tools

- ▶ Introduction to Nagios XI and Zabbix
- ▶ Installation and setup of Nagios
- ▶ Adding nodes to Nagios master
- ▶ Monitor Windows Servers
- ▶ Monitor Linux Servers
- ▶ Monitor EC2 Instances
- ▶ Monitoring different metrics in Nagios

DevOps Projects

- ▶ **Project 1:** Simple DevOps project for CI/CD through Jenkins
- ▶ **Project 2:** CI/CD pipeline using GIT, Jenkins, and Ansible
- ▶ **Project 3:** Automatic deployment using Docker