DevOps Syllabus

50 Days Total.

Introduction to DevOps

* What is DevOps
* Why DevOps
* Different types of SDLC

1. Linux Command line **5 Days**

* Introduction to OS
* Linux OS Admin
* Linux utility commands and with demos
* User admin, permission, etc
* Package installations
* **Shell Scripting.**

1. **Git/GitHub 4 DAYS**

Introduction of Git

• Installing Git

• Configuring Git

• Git Concepts and Architecture

• How Git works?

• The Git workflow

• Working with Files in Git

• Adding files

• Editing files

• Viewing changes with diff

• Viewing only staged changes

• Deleting files

• Moving and renaming files

• Making Changes to Files

• Undoing Changes

• - Reset

• - Revert

• Amending commits

• Ignoring Files

• Branching and Merging using Git

• Working with Conflict Resolution

• Comparing commits, branches and workspace

• Working with Remote Git repo using Github

• Push - Pull - Fetch using Github

• Tagging with Git

1. Jenkins **7 DAYS**

• What is Continuous Integration

• Benefits of Continuous Integration

• What is Continuous Delivery

• What is Continuous Deployment

• Continuous Integration Tools

• What is Jenkins

• History of Jenkins

• Jenkins Architecture

• Jenkins Installation and Configurations

• Jenkins Dashboard Tour

• Understand Freestyle Project

• Freestyle General Tab

• Freestyle Source Code Management Tab

• Freestyle Build Triggers Tab

• Freestyle Build Environment

• Freestyle Build

• Freestyle Post-build Actions

• Manage Jenkins

• My Views

• Credentials

• People

• Build History

• Creating a Simple Job

• Simple Java and Maven Based Application

• Simple Java and Gradle Based Application

• Simple DOTNET and MSBuild Based Application

• Jobs Scheduling in Jenkins

• Manually Building

• Build Trigger based on fixed schedule

• Build Trigger by script

• Build Trigger Based on pushed to git

• Useful Jobs Configuration

• Jenkins Jobs parameterised

• Execute concurrent builds

• Jobs Executors

• Build Other Projects

• Build after other projects are built

• Throttle Builds

• Jenkins Plugins

• Installing a Plugin

• Plugin Configuration

• Updating a Plugin

• Using Jenkins Pluginss Best Practices

• Jenkins Node Managment

• Jenkins Nodes High Availability

**• Jenkins Integration with other tools**

• Git

• SonarQube

• Maven

• Ansible

• Docker

• Tomcat/JBoss

• Nexus/Jfrog

• Reports in Jenkins

• Junit Report

• SonarQube Reports

• Selenium Reports

• Test Results

• CI Build Pipeline & Dashboard

• Email Notification

• Jenkins Advance - Administrator

• Security in Jenkins

• Authorization in Jenkins

• Authentication in Jenkins

• Managing folder/subfolder

• Jenkins Upgrade

• Jenkins Backup and Jenkins Restore

• Complete Jenkins CICD Pipeline from git to Tomcat testing Environment made of

DEV, QA and Pro

1. **Maven 1 Day**

• Introduction to Apache Maven

• Advantage of Apache Maven over other build tools

• Understanding the Maven Lifecycle and Phase

• Understanding the Maven Goals

• Understanding the Maven Plugins

• Understanding the Maven Repository

• Understanding and Maven Release and Version

• Prerequisite and Installing Apache Maven

• Understanding and using Maven Archetypes

• Understanding Pom.xml and Setting.xml

• Playing with multiples Maven Goals

• Introducing Maven Dependencies

• Introducing Maven Properties

• Introducing Maven Modules

• Introducing Maven Profile

• Introducing Maven Plugins

• How can Maven benefit my development process?

• How do I setup Maven?

• How do I make my first Maven project?

• How do I compile my application sources?

• How do I compile my test sources and run my unit tests?

• How do I create a JAR and install it in my local repository?

• How do I use plugins?

• How do I add resources to my JAR?

• How do I filter resource files?

• How do I use external dependencies?

• How do I deploy my jar in my remote repository?

• How do I create documentation?

• How do I build other types of projects?

• How do I build more than one project at once?

1. Code Scanning **1 Day**

* Sonarqube installation
* Integrate Sonarqube on Jenkins Pipeline

1. **Docker and Docker-Compose 6 Days**

**Docker**

• What is Containerization?

• Why Containerization?

• How Docker is good fit for Containerization?

• How Docker works?

• Docker Architecture

• Docker Installations & Configurations

• Docker Components

• Docker Engine

• Docker Image

• Docker Containers

• Docker Registry

• Docker Basic Workflow

• Managing Docker Containers

• Creating our First Image

• Understading Docker Images

• Creating Images using Dockerfile

• Managing Docker Images

• Using Docker Hub registry

• Docker Networking

• Docker Volumes

• Deepdive into Docker Images

• Deepdive into Dockerfile

• Deepdive into Docker Containers

• Deepdive into Docker Networks

• Deepdive into Docker Volumes

• Deepdive into Docker Volume

• Deepdive into Docker CPU and RAM allocations

• Deepdive into Docker Config

Docker Compose Overview

Install & Configure Compose

• Understanding Docker Compose Workflow

• Understanding Docker Compose Services

• Writing Docker Compose Yaml file

• Using Docker Compose Commands

• Docker Compose with Java Stake

• Docker Compose with Rails Stake

• Docker Compose with PHP Stake

• Docker Compose with Nodejs Stake

• Docker Compose with LAMP Stake

7-Kubernetes

• Understanding

1. Kubernetes **7 Days**

• Understanding the Need of Kubernetes

• Understanding Kubernetes Architecture

• Understanding Kubernetes Concepts

• Kubernetes and Microservices

• Understanding Kubernetes Masters and its Component

• kube-apiserver

• etcd

• kube-scheduler

• kube-controller-manager

• Understanding Kubernetes Nodes and its Component

• kubelet

• kube-proxy

• Container Runtime

• Understanding Kubernetes Addons

• DNS

• Web UI (Dashboard)

• Container Resource Monitoring

• Cluster-level Logging

• Understand Kubernetes Terminology

• Kubernetes Pod Overview

• Kubernetes Replication Controller Overview

• Kubernetes Deployment Overview

• Kubernetes Service Overview

• Understanding Kubernetes running environment options

• Working with first Pods

• Working with first Replication Sets

• Working with Namespaces, Resource Qoutas, Configmaps, Secrets, Stateful sets, etc

• Working with first Deployment

• Working with first Services

• **Jenkins CICD Deployment to Kubernetes**

• Introducing Helm

• Basic working with Helm

8-Ansible **5 DAYS**

• Overflow of Configuration Management

• Introduction of Ansible

• Ansible Architecture

• Let’s get startted with Ansible

• Ansible Authentication & Authorization

• Let’s start with Ansible Adhoc commands

• Let’s write Ansible Inventory

• Let’s write Ansible Playbook using various modules

• Working with Popular Modules in Ansible

• Deep Dive into Ansible Playbooks

• Working with Ansible Variables

• Working with Ansible Template

• Working with Ansible Handlers

• Roles in Ansible

• Ansible Galaxy

**9-Terraform 5 Days**

Deploying Your First Terraform Configuration

• Introduction

• What's the Scenario?

• Terraform Components

• Updating Your Configuration with More Resources

• Introduction

• Terraform State and Update

• What's the Scenario?

• Data Type and Security Groups

• Configuring Resources After Creation

• Introduction

• What's the Scenario?

• Terraform Provisioners

• Terraform Syntax

• Adding a New Provider to Your Configuration

• Introduction

• What's the Scenario?

• Terraform Providers

• Terraform Functions

• Intro and Variable

• Resource Creation

• Deployment and Terraform Console

• Updated Deployment and Terraform Commands

**10 Monitoring Prometheus and Grafana 1 Day**

• Introduction to Prometheus and grafana

• Prometheus installation

• Grafana with Prometheus Installation

•Monitor Kubernetes Cluster with Prometheus and grafana

• Client Libraries

• Pushing Metrics

• Querying

• Service Discovery

• Exporters

• Alerting

• Introduction to Alerting

• Setting up Alerts

• Internals

• Prometheus Storage

• Prometheus Security

• TLS & Authentication on Prometheus Server

• Mutual TLS for Prometheus Targets

11- Artifactory **1 DAY**

-Nexus/Jfrog

**12- Cloud Computing 6 Days**

* What is cloud computing
* The need for cloud computing
* The different public clouds AWS, GCP,AZURE

Introduction of AWS

• Understanding cloud computing.

Understanding AWS infrastructure

• Understanding AWS Free Tier

• IAM: Understanding IAM Concepts

• IAM: A Walkthrough IAM

• IAM: Demo & Lab

• Computing:EC2: Understanding EC2 Concepts

• Computing:EC2: A Walkthrough EC2

• Computing:EC2: Demo & Lab

• Storage:EBS: Understanding EBS Concepts

• Storage:EBS: A Walkthrough EBS

• Storage:EBS: Demo & Lab

• Storage:S3: Understanding S3 Concepts

• Storage:S3: A Walkthrough S3

• Storage:S3: Demo & Lab

• Storage:EFS: Understanding EFS Concepts

• Storage:EFS: A Walkthrough EFS

• Storage:EFS: Demo & Lab

• Database:RDS: Understanding RDS MySql Concepts

• Database:RDS: A Walkthrough RDS MySql

• Database:RDS: Demo & Lab

• ELB: Elastic Load Balancer Concepts

• ELB: Elastic Load Balancer Implementation

• ELB: Elastic Load Balancer: Demo & Lab

• Networking:VPC: Understanding VPC Concepts

• Networking:VPC: Understanding VPC components

• Networking:VPC: Demo & Labs

* Introduction to EKS: Demo
* CloudWatch: Demo