**DevOps Course Syllabus 2024**

**Module 1: Fundamentals of DevOps**

* What is DevOps?
* DevOps principles
* DevOps lifecycle
* DevOps delivery pipeline
* DevOps ecosystem and tools

**Module 2: Version Control with Git**

* Introduction to version control
* Basics of Git
* Installing and configuring Git
* Common Git commands
* Branching and merging strategies
* Working with remote repositories

**Module 3: Continuous Integration with Jenkins**

* Introduction to Continuous Integration (CI)
* Jenkins architecture and setup
* Managing Jenkins plugins and nodes
* Building and deploying applications using Jenkins
* Creating and managing Jenkins pipelines using scripts
* Seed Jobs and Job Process DSL
* Pipeline as code with Jenkins

**Module 4: Containerization with Docker**

* Introduction to Docker
* Docker installation and setup
* Working with Docker images and containers
* Dockerfile and image creation
* Docker networking and storage
* Docker Compose for multi-container applications.
* Docker Swarm for container orchestration

**Module 5: Orchestration with Kubernetes**

* Introduction to Kubernetes
* Kubernetes architecture and components
* Setting up a Kubernetes cluster
* Managing pods, deployments, and services
* Kubernetes networking and storage
* Helm package manager for Kubernetes
* Monitoring and logging in Kubernetes

**Module 6: Configuration Management with Ansible**

* Introduction to Ansible
* Ansible architecture and installation
* Inventory management
* Ad-hoc commands and playbooks
* Roles and modules in Ansible
* Writing and managing Ansible playbooks
* Integrating Ansible with other tools

**Module 7: Cloud Computing and DevOps**

* Introduction to cloud computing
* Overview of cloud service models (IaaS, PaaS, SaaS)
* DevOps on AWS, Azure, and Google Cloud
* Setting up CI/CD pipelines in the cloud
* Managing infrastructure as code with Terraform
* Cloud-native DevOps practices

**Module 8: Continuous Monitoring and Logging**

* Importance of monitoring and logging
* Introduction to Nagios and Prometheus
* Setting up monitoring with Nagios
* Monitoring applications with Prometheus
* Centralized logging with ELK stack (Elasticsearch, Logstash, Kibana)
* Grafana for data visualization

**Module 9: Security in DevOps**

* Introduction to DevSecOps
* Securing the CI/CD pipeline
* Container security best practices
* Security tools and practices in DevOps
* Implementing security scanning and compliance

**Module 10: Advanced DevOps Practices**

* Site Reliability Engineering (SRE)
* Chaos engineering for resilience testing
* Automated testing in DevOps
* Blue-green and canary deployments
* Scaling and performance optimization

##### Introduction to Devops

### 1

* What Is Devops
* History of Devops
* Devops definition
* DevOps Main Objectives
* DevOps and Software Development Life Cycle
  + Waterfall Model
  + Agile Model
* Continuous Integration & Deployment
  + Jenkins
* Containers and Virtual Development
  + Docker
  + Vagrant
* Configuration Management Tools
  + Ansible
  + Puppet
  + Chef

##### Cloud Computing

### 2

##### LINUX Basic and Admin

### 3

* Linux OS Introduction
* Importance of Linux in DevOps
* Linux Basic Command Utilities
* Linux Administration
* Environment Variables
* Networking
* Linux Server Installation
* RPM and YUM Installation

##### Shell Scripting

### 4

##### Continuous Integration – Jenkins

### 5

* Introduction to Jenkins
* Continuous Integration with Jenkins
* Configure Jenkins
* Jenkins Management
* Scheduling build Jobs
  + POLL SCM
  + Build Periodically
* Maven Build Scripts
* Support for the GIT version control System
* Different types of Jenkins Jobs
* Jenkins Build Pipe Line
  + Parent and Child Builds
  + Sequential Builds
* Jenkins Master & Slave Node Configuration
* Jenkins Workspace Management
* Securing Jenkins
  + Authentication
  + Authorization
  + Confidentiality
  + Creating Users
* Jenkins Plugins
  + Installing Jenkins Plugins
  + SCM plugin
  + Build and test

##### Version Control-GIT

### 6

* GIT Features
* 3-Tree Architecture
* GIT – Clone /Commit / Push
* GIT Hub Projects
* GIT Hub Management
* GIT Rebase & Merge
* GIT Stash, Reset, Checkout
* GIT Clone, Fetch, Pull

##### Build tool- Maven

### 7

* Maven Installation
* Maven Build requirements
* Maven POM Builds (pom.xml)
* Maven Build Life Cycle
* Maven Local Repository (.m2)
* Maven Global Repository
* Group ID, Artifact ID, Snapshot
* Maven Dependencies
* Maven Plugins

##### ANSIBLE

* Introduction to Ansible
* Ansible Server Configuration
* Infrastructure Management
* SSH Connection in Ansible Master
* YAML Scripts
* Host Inventory
  + Hosts and Groups
  + Host Variables
  + Group Variables
  + Host and Group Specific Data
* Ad-hoc Commands
* Playbooks
  + Variables
  + Conditionals
  + Loops
  + Blocks
  + Handlers
  + Templates
* Modules
  + Core Modules
  + Extra Modules
* Ansible Roles

### 8

##### Docker

* How to get Docker Image?
* What is Docker Image
* Docker Installation
* Working with Docker Containers
  + What is Container
  + Docker Engine
  + Crating Containers with an Image
  + Working with Images
* Docker Command Line Interphase
* Docker Compose
* Docker Hub
* Docker Trusted Registry
* Docker swarm
* Docker attach
* Docker File & Commands