DevOps Certification Training Curriculum

STRUCTURE

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"DevOps: DevOps is a set of Practices that Combines Software Development and IT Operations. It aims to shorten the Systems Development Life Cycle and provide Continuous Delivery with High Software Quality"

Course Description:

- **About Croma Campus DevOps Training Program:** Our DevOps training is designed keeping in mind the latest trend in the world of technologies.

  This course will provide you the in-depth knowledge of various DevOps tools including **Git, Maven, Jenkins, Nexus Repository, SonarQube, Docker, Ansible, Puppet, Kubernetes and Nagios**. This training is completely hands-on oriented and designed in a way that will help you in becoming a certified practitioner by providing you an intensified training for the best practices about Continuous Development, Configuration Management, including Continuous Integration and Continuous Deployment and finally Continuous Monitoring of the software throughout its development life cycle.

  - ❖ **Git:** For Version Control for Tracking Changes in the Code Files
  - ❖ **Maven:** For Software Packaging
  - ❖ **Jenkins:** For Continuous Integration and Continuous Deployment
  - ❖ **Nexus Repository:** For Software Component Management
  - ❖ **SonarQube:** For Code Quality and Security
  - ❖ **Docker:** For Container Image which is a Lightweight, Executable Package of Software which includes everything needed to run the image (e.g. code, libraries, etc.)

  - ❖ **Puppet:** Open-source Software Configuration Management Tool
  - ❖ **Nagios:** Application Monitoring Tool
  - ❖ **Ansible:** Ansible is an Open-Source Software Provisioning, Configuration Management, and Application-Deployment Tool Enabling Infrastructure as Code.
  - ❖ **Kubernetes:** Kubernetes is an Open-Source Container-Orchestration System for Automating Computer Application Deployment, Scaling, and Management.

Course Content:

Module 1: Infrastructure Setup

In this module, you will learn what Cloud Computing is and what are the different models of Cloud Computing along with the key differentiators of different models. We will also introduce you to virtual world of AWS along with AWS key vocabulary, services and concepts.

- EC2 Walkthroug
- Installation of DevOps Tools in the Cloud
  - Git
  - Docker
  - Selenium
  - Jenkins
  - Puppet
  - Ansible
  - Kubernetes

Module 2: Overview of DevOps: In this module you will be introduced to DevOps environment.

- Why DevOps?
- What is DevOps?
- DevOps Market Trends
- DevOps Engineer Skills
- DevOps Delivery Pipeline
- DevOps Ecosystem

Module 3: Introduction to DevOps on Cloud:

Learn about various Cloud Services and service providers; also get the brief idea of how to implement DevOps using AWS.

- Why Cloud?
- Introduction to Cloud Computing
- Why DevOps on Cloud?
- Introduction to AWS
- Various AWS Services
- DevOps using AWS

Module 4: Git, Jenkins & Maven (Version Control, Continuous Integration & Build)

In this module, you will learn about the different actions performed through Git and will be introduced to Jenkins and Maven.

- Version Control with Git
  - What is Version Control
  - What is Git
  - Why Git for your Organization
  - Install Git
  - Common Commands in Git
  - Working with Remote Repositories
- Git, Jenkins & Maven Integration
  - Branching and Merging in Git
  - Git Workflows
  - Git Cheat Sheet
  - What is CI
  - Why CI is Required
  - Introduction to Jenkins (With Architecture)
  - Introduction to Maven
  - Branching and Merging, Stashing, Rebasing, Reverting and Resetting
  - Build and Automation of Test using Jenkins and Maven
- Jenkins (Continuous Integration)
  - Jenkins Management
  - Adding a Slave Node to Jenkins
  - Building Delivery Pipeline
  - Pipeline as a Code
  - Implementation of Jenkins
  - Build the Pipeline of Jobs using Jenkins
  - Create a Pipeline Script to Deploy an Application over the Tomcat Server

Module 5: AWS (Amazon Web Services)

In this module, you will learn about the introduction to compute offering from AWS called EC2. We will cover different instance types and Amazon AMIs. A demo on launching an AWS EC2 instance, connect with an instance and hosting a website on AWS EC2 instance. We will also cover EBS storage Architecture (AWS persistent storage) and the concepts of AMI and snapshots.

- Introduction to Cloud Computing & AWS
- Elastic Compute and Storage Volumes
- Load Balancing, Autoscaling and DNS
- Virtual Private Cloud
- Storage - Simple Storage Service (S3)
- Databases and In-Memory DataStores
- Management and Application Services
- Access Management and Monitoring Services
- Automation and Configuration management

- AWS Migration
- AWS Architect Interview Questions

Module 6: Docker (Continuous Deployment)

This module introduces Docker to Readers, the Core Concepts and Technology behind Docker. Learn in detail about Container and various Operations Performed on it.

- Shipping Transportation Challenges
- Introducing Docker
- Understanding Images and Containers
- Running Hello World in Docker
- Introduction to Container
- Container Life Cycle
- Sharing and Copying
- Base Image & Docker File
- Working with Containers
- Publishing Image on Docker Hub
- Create and Implement Docker Images and Containers

Module 7: Puppet (Continuous Deployment)

Configuration Management with Puppet: In this module, you will learn to Install and Configure Puppet. Additionally, understand the Master-Agent Architecture in Puppet.

- Introduction to Puppet
- Puppet Installation
- Puppet Configuration
- Puppet Master and Agent Setup
- Puppet Module
- Node Classification
- Puppet Environment
- Puppet Classes
- Automation & Reporting
- Install and Configure Puppet
- Configure and Implement Servers using Puppet

Module 8: Ansible (Configuration Management)

Configuration Management with Ansible: In In this module, you will learn to Install Ansible and Configure Ansible Roles. You will also learn to write Playbooks and finally Execute Ad-Commands using Ansible.

- Introduction to Ansible
- Ansible Installation
- Configuring Ansible Roles
- Write Playbooks
- Executing Adhoc Command & Installing Ansible
- Configuring Ansible Role & Write Playbooks
- Execute Adhoc Commands

Module 9: Kubernetes (Containerization using Kubernetes)

Containerization using Kubernetes: In this module, you will learn the basics of Kubernetes and its Integration with Docker.

- Revisiting Kubernetes Cluster Architecture
- Spinning up a Kubernetes Cluster on Ubuntu VMs
- Exploring your Cluster
- Understanding YAML
- Creating a Deployment in Kubernetes using YAML
- Creating a Service in Kubernetes
- Installing Kubernetes Dashboard
- Deploying an App using Dashboard
- Using Rolling Updates in Kubernetes
- Containers and Container Orchestration
- Introduction to Kubernetes
- Setting up the Kubernetes Cluster
- Accessing your application through service
- Deploying an app through Kubernetes Dashboard
- Rolling updates in Kubernetes

Module 10: Nagios (Continuous Monitoring with Nagios)

Continuous Monitoring with Nagios: In Objective: Learn how to Continuously Monitor your Tasks using Various Plugins and Implementing Nagios Commands.

- Introduction to Continuous Monitoring
- Introduction to Nagios
- Installing Nagios
- Nagios Plugins(NRPE) and Objects
- Nagios Commands and Notification
- Installing Nagios
- Monitoring of different servers using Nagios