CROMA CAMPUS 15 YEARS | in Collaboration with Microsoft

Course Curriculum

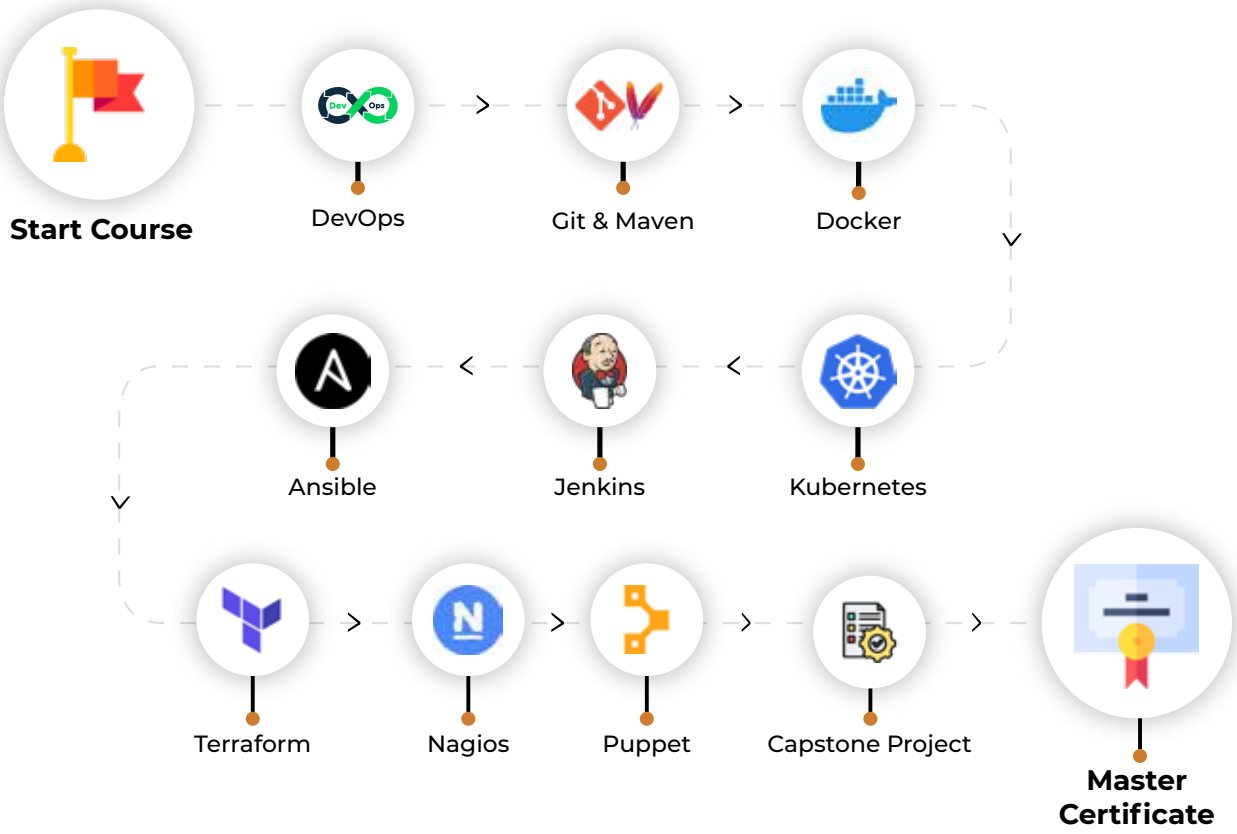
MASTER IN DEVOPS ENGINEERING

500K+	100K+	300+	300K+	200+	150+
Satisfied Students	Online Students	Trainers	Placements	Global Certifications	Companies

CC-V1

Program INDEX

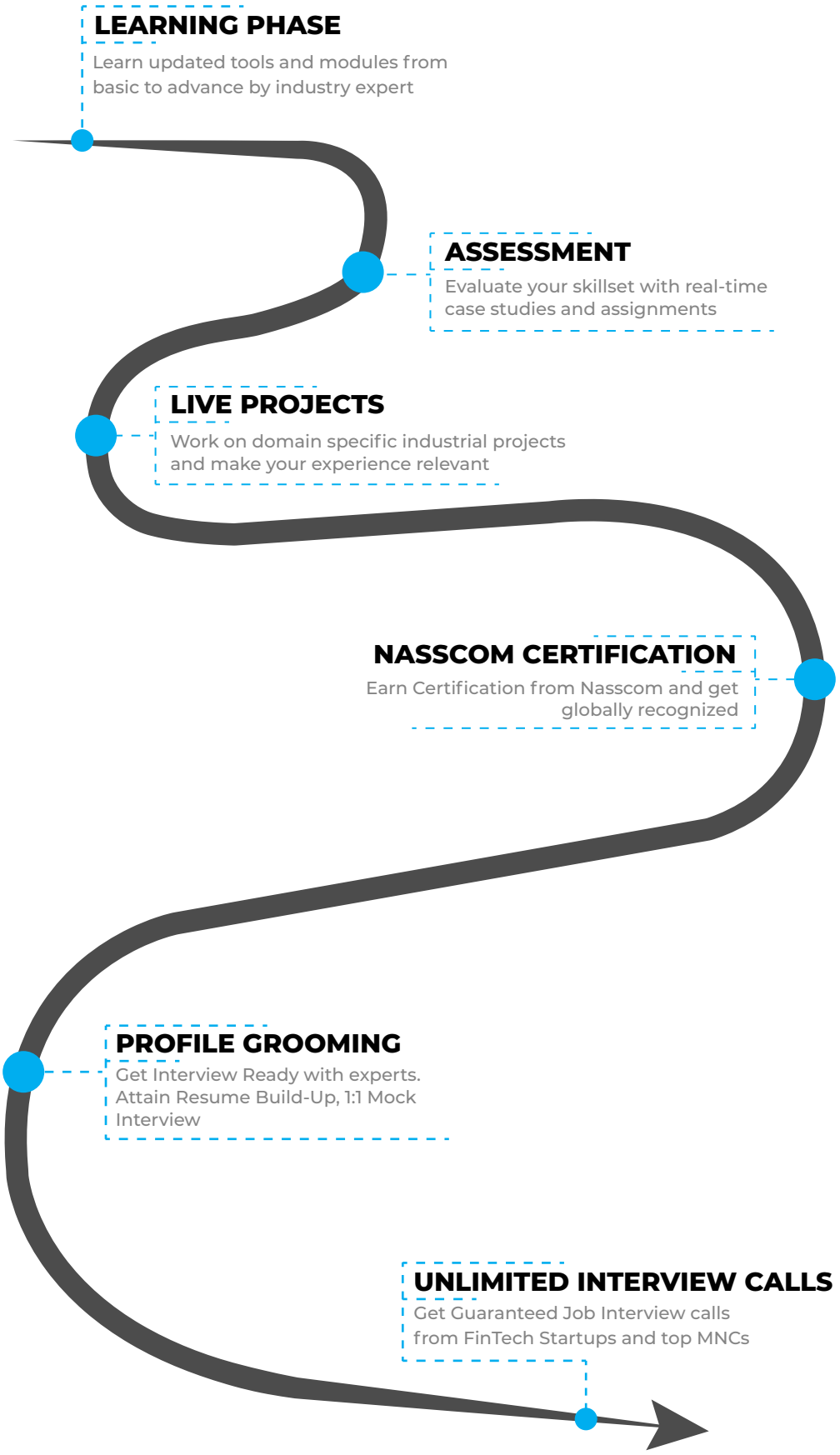
Learning Curve



Modules of **Master in DevOps Engineering**

- DevOps Fundamentals
- Git & Maven (Version Control, Continuous Integration
- Docker
- Kubernetes
- Jenkins
- Ansible
- Terraform
- Puppet (Continuous Deployment)
- Nagios (Continuous Monitoring with Nagios)

Transition Process



LEARNING PHASE
Learn updated tools and modules from basic to advance by industry expert

ASSESSMENT
Evaluate your skillset with real-time case studies and assignments

LIVE PROJECTS
Work on domain specific industrial projects and make your experience relevant

NASSCOM CERTIFICATION
Earn Certification from Nasscom and get globally recognized

PROFILE GROOMING
Get Interview Ready with experts. Attain Resume Build-Up, 1:1 Mock Interview

UNLIMITED INTERVIEW CALLS
Get Guaranteed Job Interview calls from FinTech Startups and top MNCs

Module 1: DevOps Fundamentals

Infrastructure Setup

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

Overview Of DevOps: In This Module You Will Be Introduced TDevOps Environment.

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

Module 3: Introduction TDevOps On Cloud:

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

Module 2: Git & Maven (Version Control, Continuous Integration

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 tJenkins (With Architecture)
- Introduction tMaven
- Branching and Merging, Stashing, Rebasing, Reverting and Resetting
- Build and Automation of Test using Jenkins and Maven

Module 3: Docker

Containerization Overview

- Containerization
- History of Containers
- Namespaces and C Groups
- Containers vs Virtual Machines
- Types of Containers
- Introduction to Docker
- Docker Architecture
- Container Lifecycle
- Docker CE vs Docker EE

The Docker Engine

- Docker Engine
  - Setting up Docker Engine
  - Upgrading Docker Engine
- Setting up logging drivers in Docker
- Configuring Logging Drivers
- Docker Terminology
- Port Binding
- Detached vs Foreground Mode
- Starting Containers in different modes
- Docker CLI Commands
- Docker Exec Commands
- Restart Policy in Docker
- Removing Containers

Image Management & Registry

- Docker-file
- Write a Docker-file to create an Image
- Docker-file Instructions
- Docker Registry
- Configuring Local Registry
- Build Context
- Docker Image Tags
- Setting up Docker Hub
- Removing Images from the Registry

Storage In Docker

- Docker Storage
- Types of Persistent Storage
- Volumes
- Bind Mounts
- TMPFs Mount
- Storage Drivers
- Device Mapper
- Docker Clean Up

Orchestration In Docker

- Docker Compose
- Deploy a Multi-container Application using Compose
- Docker Swarm
- Running Docker in Swarm mode
- Docker Service
- Deploying a Service in Swarm
- Service Placement
- Scale Services
- Rolling Update and Rollback
- Docker Stack

Networking And Security

- Docker Networking
- Network Drivers
- Bridge Network
- Overlay Network
- Host and Macvlan
- Docker Security
- Docker Content Trust
- Securing the Docker Daemon
- Create and use a User-defined Bridge Network
- Create and use an Overlay Network
- Use Host and Macvlan Network
- Configure Docker to use External DNS
- Signing images using DCT

Docker EE And Monitoring

- Docker Enterprise
- Universal Control Plane (UCP)
- UCP Architecture
- Access Control in UCP
- Docker Trusted Registry (DTR)
- Monitoring using Prometheus

Docker With Kubernetes

- Kubernetes Core Concepts

- Setup Kubernetes cluster using GKE
- Kubernetes Common Commands
- Pods - Deploy a Pod
- Deployments - Use a Deployment for pod management
- Labels, Selectors, and Annotations
- Services - Deploy different Services
- Persistent Volumes and Persistent Volume Claims
- Use Persistent Storage in Kubernetes
- Storage Classes
- Use Storage Classes

Docker With Microservices

- What are Microservices?
- Understanding Microservices and Docket together
- Using Docker for Microservices
- Advantages of using Docker for Microservices
- Design Microservices Architecture with Docker Containers
- Extending the Architecture of a Microservices-Based App with Docker

Module 4: Kubernetes

Kubernetes Core Concepts And Networking

- Kubernetes Fundamentals
  - Kubernetes Core Concepts
  - Kubectl common commands
  - Understanding Pods
  - Configure network on cluster nodes
  - Pod Networking Concepts
  - Setting up a cluster - Kubernetes Certificates
- Practical Assignment:
  - Perform basic Kubectl commands
  - Deploy pods and use INIT containers to pre-set an environment
  - Configure Kubernetes network using Calico
  - Use certificates to authenticate resources

Kubernetes Services And Scheduling

- Services and Controllers
- Service Networking
- Deploy different kinds of services
- Deploy and configure network Load Balancer
- Primitives necessary for self-healing apps
- Effects of resource limiting on pod scheduling
- Configure Kubernetes Scheduler
- Running multiple Schedulers

Kubernetes Controllers

- Replica Set and Replication Controller

- Deploy different Replication Controllers
- About Daemon Sets
- Use Daemon Sets on nodes
- Deployments
- Manage pod updates using Deployments
- Rolling updates and Rollbacks
- Scaling applications and Ingress
- Use HPA for dynamic work-load management
- Use Ingress controller and rules to manage network traffic

Persistent Storage In Kubernetes

- Persistence Storage Overview
  - Persistent Volume and Persistent Volume Claim
  - Access modes for volumes
  - Primitives for Persistent Volume Claim
  - Secrets and Config Maps in your pods
  - Storage classes
  - Headless services
  - Stateful Sets
- Lab Work:
  - Deploy Persistent Volume and Persistent Volume Claim
  - Use Secrets and Config Maps in your applications
  - Use Storage Class for dynamic storage allocation
  - Use stateful applications for sticky identities for pods
  - Deploy a highly available replicated MariaDB cluster

Securing Clusters

- Basic Concepts:
  - Authentication
  - Authorization
  - Kubernetes security primitives
  - Configure Network Policies
  - Security Contexts
- Lab Work:
  - Create and use Roles and Role Bindings
  - Define custom Egress and Ingress policies
  - Use probes and configure a restart policy for pods
  - Define privilege and access control using security contexts

Logging & Monitoring Clusters

- Monitor cluster using Prometheus
- Visualize logs using EFK stack
- Deploy jobs to run tasks to completion
- Manage etcd cluster
- Use Helm Charts

Troubleshooting Clusters

- Troubleshooting application failures

- Troubleshooting cluster failures

Module 5: Jenkins

Introduction To CI/CD

- Lesson Introduction
- Traditional Software Development
- Continuous Integration
- Continuous Delivery
- Continuous Deployment
- Building the continuous deployment process
- Automated Deployment Pipeline
- CI/CD Tool Selection

Getting Started With Jenkins

- Lesson Introduction
- Setting Up Git
- Assisted Practice: Git Set-up
- Setting Up Jenkins
- Assisted Practice: Jenkins Set-up
- Maven Set-up
- Assisted Practice: Maven Set-up
- Exploring Jenkins
- Assisted Practice: Build a Maven Project
- Building a Maven Project with Jenkins

Build Jobs And Configurations

- Lesson Introduction
- Understanding Jenkins Build Jobs
- Freestyle Build Jobs
- Assisted Practice: Freestyle Job
- Build Triggers
- Assisted Practice: Scheduled Builds
- Assisted Practice: Polling SCM
- Build Steps
- Jenkins Environment Variables
- Post-build Actions
- Assisted Practice: Post-build Actions
- Using Jenkins with Other Languages
- Assisted Practice: Building Projects with Gradle
- Parameterized Build Jobs
- Assisted Practice: Parameterized Builds
- Assisted Practice: Building From Tags
- Assisted Practice: Remote Triggering Parameterized Builds
- Enabling Security in Jenkins
- Assisted Practice: Enabling Security

- Build Pipelines and Promotions
- Triggering Parameterized Builds

Configuring Build Pipelines

- Lesson Introduction
- Introducing Pipelines
- Understanding Pipeline Structure
- Defining a Pipeline
- Declarative Pipeline Syntax
- Scripted Pipeline Syntax
- Assisted Practice: Building Pipelines In Jenkins
- Building a Pipeline
- Continuous Integration Pipeline
- Assisted Practice: Building Continuous Integration Pipelines in Jenkins File
- Building Pipelines from Jenkinsfile
- Assisted Practice: Building Continuous Integration Pipelines in Jenkinsfile
- Snippet Generator
- Unassisted Practice: Snippet Generator
- Global Variable Reference
- Declarative Directive Generator
- Unassisted Practice: Restarting Pipelines
- Multistage Pipeline

Automated Testing In Jenkins

- Jenkins as an Automation Testing tool
- Assisted Practice: CI with Junit in Jenkins
- Code Coverage using Jacoco
- Assisted Practice: Code Coverage with Jacoco
- Code Coverage using Clover
- Assisted Practice: Code Coverage with Clover
- Acceptance and Performance Tests in Jenkins
- Assisted Practice: Integrate JMeter with Jenkins
- Testing Code Coverage

Code Quality Improvement Using Jenkins

- Code Quality and Jenkins
- Internals of Jenkins Jobs
- Assisted Practice: Find Bugs Integration with Jenkins
- Code Complexity
- Assisted Practice: Coverage Complexity with Jenkins
- Open Tasks & Sonar Qube
- Assisted Practice: Sonar Qube with Jenkins
- Static Code Analysis

Automated Deployment And Continuous Delivery

- Introduction to Automated Deployment and Continuous Delivery
- Building the Continuous Delivery Process
- Implementing Automated and Continuous Deployment

- Assisted Practice: Deploying a Python Application
- Assisted Practice: Tomcat and Jenkins
- Assisted Practice: PHP and Jenkins
- Deploying Maven App to Tomcat Server

Distributed System In Jenkins

- Introduction to Distributed Architecture
- Assisted Practice: Create Multiple Slave Nodes
- Deep Diving Jenkins Master/Slave Architecture
- Assisted Practice: Assigning Jobs to Specific Slave Nodes
- Distributed Builds

Module 6: Ansible

Introduction To Ansible

- Evolution of Infrastructure
- Overview of Infrastructure as a Code
- What is Configuration Management
- Ansible Overview

Ansible Architecture & Installation

- Ansible Architecture and its working
- Ansible in DevOps
- Installation and Configuration
- Working with Command Line Tools

The Playbook Grammar

- Playbook YAML definition
- Playbook terms
- Playbook tasks

Writing Ansible Playbooks

- Hosts and Users
- Variables
- Tasks
- Handlers
- Jinja2 Templates

Ansible Modules

- Overview of Modules
- Types of Modules
- Core Modules
- Extras Modules
- Return Values
- Adhoc Commands
- Case Study

Ansible Roles

- Overview of Roles
- Role Directory Structure
- Using Roles
- Working with Ansible Galaxy

Ansible Tower

- Installing Ansible Tower
- Features of Ansible Tower
- Managing Jobs
- Manage and Track Inventory
- Remote Command Execution
- Case Study

Module 7: Terraform

Getting Started & Setting Up Labs

- Choosing a right Infrastructure as Code Tool
- Installing Terraform - Windows Users
- Installing Terraform – Mac OS and Linux Users
- Choosing Right IDE for Terraform IAC development
- Setting up AWS account

Deploying Infrastructure With Terraform

- Creating first EC2 instance with Terraform
- Understanding Resources & Providers
- Destroying Infrastructure with Terraform
- Understanding Terraform State files
- Understanding Desired & Current States
- Challenges with the current state on computed values
- Terraform Provider Versioning
- Types of Terraform Providers

Read, Generate, Modify Configurations

- Understanding Attributes and Output Values in Terraform
- Referencing Cross-Account Resource Attributes
- Terraform Variables
- Approaches for Variable Assignment
- Data Types for Variables
- Fetching Data from Maps and List in Variable
- Count and Count Index
- Conditional Expressions
- Local Values
- Terraform Functions
- Data Sources
- Debugging in Terraform

- Terraform Format
- Validating Terraform
- Configuration Files
- Load Order & Semantics
- Dynamic Blocks
- Tainting Resources
- Splat Expressions
- Terraform Graph
- Saving Terraform Plan to File

Terraform Provisioners

- Understanding Provisioners in Terraform
- Types of Provisioners
- Implementing remote-exec provisioners
- Implementing local-exec provisioners

Terraform Modules & Workspaces

- Understanding DRY principle
- Implementing EC2 module with Terraform
- Variables and Terraform Modules Terraform Registry
- Terraform Workspace
- Implementing Terraform Workspace

Remote State Management

- Integrating with GIT for team management
- Security Challenges in Commiting TFState to GIT
- Remote State Management with Terraform
- Implementing S3 Backend
- Challenges with State File locking
- Integrating DynamoDB with S3 for state locking
- Terraform State Management
- Importing Existing Resources with Terraform Import

Security Primer

- Handling Access & Secret Keys the Right Way in Providers
- Terraform Provider Use Case - Resources in Multiple Regions
- Handling Multiple AWS Profiles with Terraform Providers
- Terraform & Assume Role with AWS STS
- Sensitive Parameter

Module 8: Puppet (Continuous Deployment)

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 9: Nagios (Continuous Monitoring with Nagios)

- 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

Course Projects

Domain: Cloud / DevOps

Project Name:

Infrastructure as Code(IaC) with Terraform and Ansible

An advanced DevOps project focused on automating infrastructure provisioning and configuration management using Terraform and Ansible. The project enables organizations to define, deploy, and manage infrastructure in a scalable, consistent, and repeatable manner. Automated workflows ensure faster deployments, reduce manual errors, and improve overall operational efficiency.

Tool & Technology Used:

TERRAFORM | ANSIBLE | AWS/AZURE/GCP | JENKINS | GIT/GITHUB

Domain: Cloud Computing & DevOps

Project Name:

Multi-Cloud Disaster Recovery with DevOps

An automated disaster recovery solution using DevOps principles to ensure business continuity. It replicates applications and data across multiple cloud providers, automating failover to minimize downtime and enhance resilience against regional outages.

Tool & Technology Used:

TERRAFORM | ANSIBLE | VELERO | PROMETHEUS | GRAFANA

Domain: DevOps & Cloud Computing

Project Name:

Advanced Kubernetes Cluster Monitoring and Autoscaling

A project focused on building a sophisticated system for monitoring and autoscaling Kubernetes clusters. It uses advanced metrics to predict resource needs and automatically adjust cluster size, ensuring optimal performance and cost efficiency.

Tool & Technology Used:

KUBERNETES | PROMETHEUS | GRAFANA | DOCKER | JENKINS

Domain: DevOps

Project Name:

Build & Push Docker Image using Jenkins Pipeline

This project automates the process of building a Docker image and pushing it to a container registry using a Jenkins CI/CD pipeline. The pipeline is configured to trigger on code changes, ensuring that the Docker image is always up-to-date. This approach streamlines the deployment workflow, enabling faster and more reliable application releases.

Tool & Technology Used:

JENKINS | AMAZON | DOCKER | GIT/GITHUB | CI/CD WORKFLOW

e-Learning through LMS

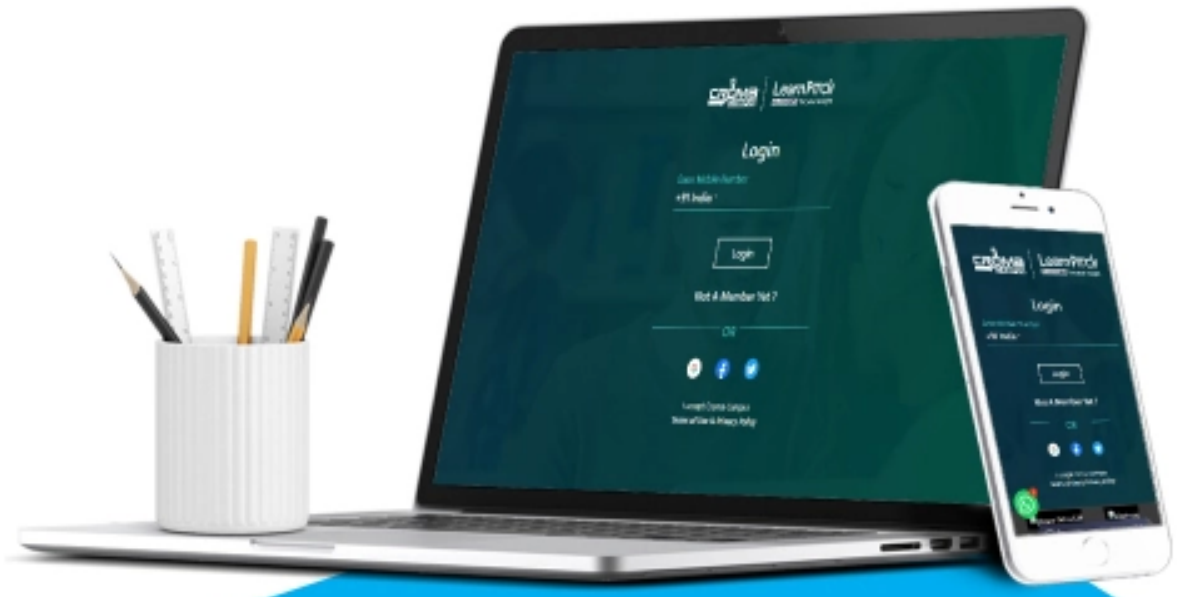
Learning **Management System**

Our LMS (LearnPitch) is for the administration, documentation, tracking, reporting, automation, and delivery of educational courses, training programs, or learning and development programs.

Our LMS has been designed to identify training and learning gaps, using analytical data and reporting to keep you up with the class activities.

Key Features **Learning Management System**

- Live Sessions with Class recordings
- Get study material with Assignments.
- Track your curriculum covered.
- Track your class wise attendance
- Share your feedback for Trainer & Training
- Get your Training Certificate from LMS



Training Certification

Earn Your **Certificate**

Your certificate and skills are vital to the extent of jump-starting your career and giving you a chance to compete in a global space.

Croma Campus is Nasscom Certified

Croma Campus is now

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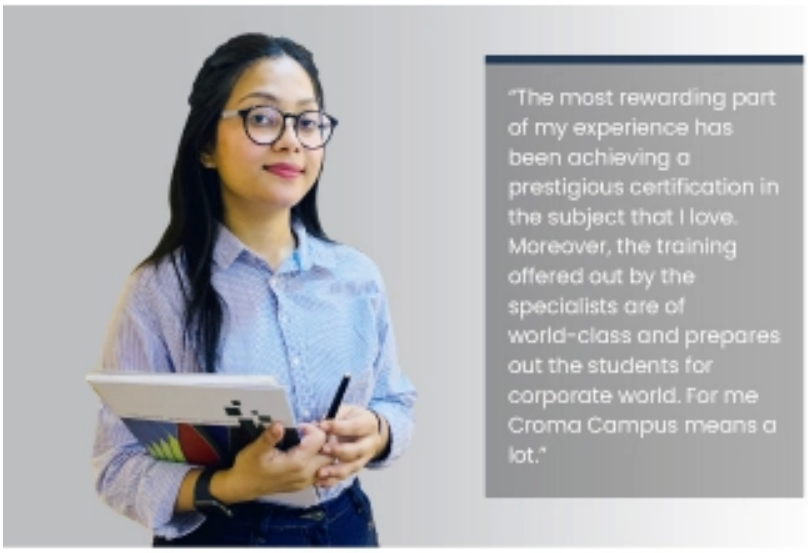
|Croma Campus! Reviews



"The most rewarding part of my experience has been achieving a prestigious certification in the subject that I love. Moreover, the training offered out by the specialists are of world-class and prepares out the students for corporate world. For me Croma Campus means a lot."

"By The Students For The Students"

Your Success is **Our Story**

Bharat

"I am fully satisfied with the excellent training services received by the expert staff at Croma Campus. I want to thank Croma Campus for providing me with the most innovative and affordable training services for learning all the software testing procedures and guidelines."

Ankit

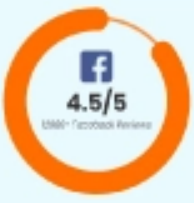
"It was a lifetime experience for me to get trained by IT Experts of Croma Campus. What I liked most about the training was the consistent high-quality education, which was friendly and co-active. The placement department was also proactive, they keep me updated regarding new job opportunities and provide the grooming session to crack the interview. At last, I would like to thank all faculty members of Croma Campus for their immense help and support."

Umesh

"Without any second thought, I will give Croma Campus 10/10. Their placement department is highly proactive. I remember they started scheduling interviews for me from the very next day when I told them my course has been completed. These people are doing a phenomenal job and I highly recommend Croma Campus to everyone."

Shams Khan

"Croma Campus is doing a phenomenal job in the IT training industry. The reason why I decided to join their training program was that they provide quality training at very a nominal price. Plus, the online training mode was also a factor due to which I decided to join the training program of Croma Campus as I didn't want to attend physical classes."



Meet Our Team

Sales Team

Our Sales team is highly passionate, emphatic, positive attitude, great listening skills, ability to deliver quick solutions, and they are multitasker too. Our team always remains up-to-date about all the latest technologies and market trends. With effective communication skills, they always work to deliver the right information to customers when it is needed.

Product Team

Our product team is highly functional and collaborative working together to achieve the common outcome of designing exceptional digital experiences. Each of our members is a contributor to help us achieve success in long-run. Sitting at the high-end of technology and innovation, team helps to deliver high-end customer experiences and always comes out with a big idea as a game-changing plan.

Marketing Team

Our Marketing team works as gladiators and helps us to achieve business success in all possible ways. They are included in almost everything either it is building a brand, creating brand awareness, promoting products or services, delivering trailblazing customer experiences or increasing engagement at public forums. They are the true backbone of the Company.

Content Team

Our content team is responsible for ideation, creation, optimization, and distribution of content throughout the company. The team always starts its work with a strategy, how to create high-quality contents, and how to promote or share the content. Our in-house content team help us to produce all types of contents either they are educational content pieces, marketing content, SEO content, or any other forms too.

Customer Access Team

This is the team that has actually been taken up us from reactive state to a pro-active state. The team utilizes high-valued solutions to satisfy customers in all possible ways. It is truly said that no company can succeed if your customers are not satisfied. And our customer success team is dedicatedly working to keep all the customers satisfied and we always consider our customer feedback on priority.

HR Team

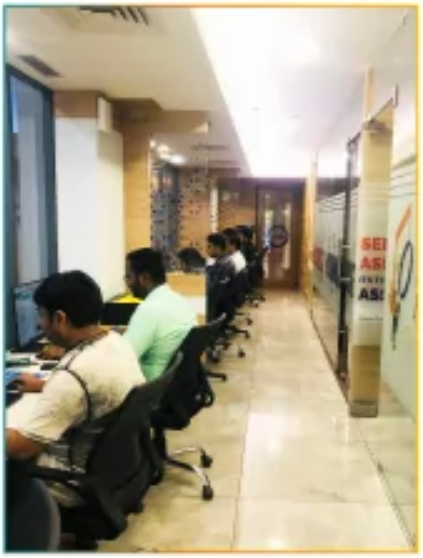
Our HR team is committed to provide high-end solutions to employees as they require. Our HR team has the right skills and knowledge to make sure that the HR department can always be legally and strategically successful. They know how to keep employees motivated all the time with the best HR policies and fun activities too from time to time.

Glimpse Of Our Office

Look **Who We are**

Our office's infrastructure comprises all the necessary software and network resources that are required to deliver IT & Design, Human Resources, Digital Marketing, and training services.

We are well-equipped with bright designed work bays for employees and managers having separate cabins with spacious cafeteria and training classrooms.



About Croma Campus

“Our Mission is to Build Nation through Education & Beyond Limitation.”

CROMA CAMPUS #1 Asia's Leading Edtech Company

Croma Campus Training & Development Private Limited is an education platform providing rigorous industry-relevant programs designed and delivered in collaboration with world-class faculty, industry & Infrastructure. In the past 15 years we have trained 18000+ candidates and out of which we are able to place 12000+ professionals in various industries successfully.

We're Here to Help –

Reach Out to Our Global Offices

India

Croma Campus Training & Development Private Limited

G-21, Block-G, Sector 3, Noida, Uttar Pradesh-201301

+91-971 152 6942 Chat on WhatsApp

View on Google Maps

Canada

Croma Campus Training & Development Private Limited

279-B Baltzan BLVD, Saskatoon, Saskatchewan, Canada-S7W0S1

+1 (647) 370-6470 Chat on WhatsApp

View on Google Maps

USA

Croma Campus Training & Development Private Limited

454 church street Cairo, GA-39828, United States of America

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