# DevOps Curriculum	
Duration of the training 125 hours	
Module 1	**Total: 25hrs**
DevOps Overview	**4hrs**
• Evolution of Waterfall, Agile and DevOps	
• What is DevOps	
• Why DevOps	
• Benefits of DevOps	
• DevOps Stages	
• DevOps Lifecycle	
• Various Automation in DevOps	
• Overview of CICD	
AWS Fundamentals	**10hrs**
• Understanding of Physical and Virtual Servers	
• Overview of Public/Private Cloud Computing	
• Overview of AWS/Azure/GCP	
• Benefits of Cloud Computing	
• Pricing and Usage Policy	
• Overview of IAM Service	
• Overview of EC2 Service	
• Overview of RDS Service	
• Overview of Cloud Storages	
• Overview of Public and Private Ips	
• Overview of Elastic IP, CloudFront and ELB.	
• Overview of EKS, ACR:	
Practical Includes	
1. AWS Free Tier Account Creation	
2. IAM User Creation	
3. EC2 Instance Creation	
4. Security Group Configuration	
5. Creation of database using RDS	
6. Connecting Ec2 Instance	
7. Connecting database	
8. Creation of S3 storage	
DevOps on Cloud (AWS)	**4hrs**
• Overview of AWS DevOps and Azure DevOps	
• Cod Build,	
• Code Commit,	

• Code Deploy	
• Code Pipeline	
• Working with Cloud Formation	
Linux Fundamentals	**7hrs**
• Overview of Linux	
• Linux Architecture	
• Linux Distributions	
• Basic Linux Commands	
• File Permission Management	
• User Creation	
• Shell Scripts	
• SSH and VI Utility	
Practical Includes:	
1. Creation of User.	
2. Establishing SSH Connection to the Server	
3. File creation and Manipulation using VI editor	
4. Managing permissions	
5. Basic commands execution	
6. Writing Shell Scripts Program	
Module 2	**Total :25.5hrs**
Application Development Fundamentals	**4hrs**
• Overview of Application Development	
• Various Types of Application	
• Introduction to Databases	
• Multi-tiered application architecture	
• Overview of Monolithic and Microservices	
Introduction to Java Concepts	**4hrs**
• Overview of Java and its Architecture	
• Compiling Source Code and Packaging Applications	
• Java Console based and Web based Applications	
• Deployment to Tomcat and Consuming Java Applications	
• OOPs Concept Practical Includes	
Practical Includes	
1. Create a Console based Java Application	
2. Create a Dynamic web Application and Deploy it to Tomcat Server	
Understanding and Using Build Tools	**4.5hrs**
• Overview of Various Build Tools	
• What is Maven • Maven Architecture	

• Maven Plugins	
• Maven Archetypes	
• Maven Commands	
• Integration of Jacoco plugin for Code Coverage	
• Setting up Maven Applications	
Practical Includes:	
1. Creation of Simple Java Application using Maven	
2. Creation of Java Web Application using Maven	
3. Creation of Java Spring Boot Microservice using Maven	
4. Maven Commands demonstration to Build, Test and Package the projects	
Continuous Testing with Selenium	**5hrs**
• Overview of Continuous Testing	
• Software Testing Life Cycle	
• Different Types of Testing	
• Test-Driven Development Approach using Junit	
• Overview of Selenium, features, benefits	
• Testing Web Application using Selenium	
• Generating Reports using TestNG	
Practical Includes:	
1. Configuring Selenium and web drivers	
2. Writing Selenium Testcases and executing them.	
3. Test driven development using Junit	
4. Exporting Selenium Test Application as Runnable Jar	
5. Generating reports using TestNG	
Overview of Python	**4hrs**
• Overview of Python	
• Features, Benefits, Uses of Python	
• Installation and Setup of Python Environment	
• Python Console based application and Web Application using Flask	
Deploying and Consuming Python Applications	
Practical Includes	
1. Create a Console based Python Application	
2. Create a Web Application using Flask	
Structure Query Language (SQL)	**4hrs**
• Overview of SQL	
• DDL Statements	
• DML Statements	
• DCL Statements	

• Database Constraints	
• Aggregate Functions (Avg, Sum, Max, Min, Count)	
• Order By, Group By and Having Clauses	
• Various types of Joins	
Practical Includes:	
1. Create and Alter and Drop Tables	
2. Insert, Update, Delete and View Data	
3. Apply database constraints	
4. Statements execution using Order By, Group By and Having clauses	
5. Applying Joins, Executing Subqueries and Aggregate functions	
Module 3	**Total: 6hrs**
Managing Source Code – Git and GitHub	**6hrs**
• Overview of Version Control System	
• Central vs Distributed Version Control System	
• Introduction to Git	
• Installation and setting up Git	
• Important Git Commands	
• Creating and Managing git Repositories	
• Branching, Merging, Stashing, Rebasing, Reverting and Resetting	
• Introduction to GitHub	
• Managing Remote Repositories	
Practical includes:	
1. Installation and Configuration of git	
2. Creating Git Repositories	
3. Demonstrating various Git repositories	
4. Merging Branches and Managing merge conflicts	
5. Stashing, Reverting, Rebasing and Resetting	
6. Collaborating local and remote repositories	
Module 4	**Total: 7hrs**
Continuous Integration Using Jenkins	**7hrs**
• Overview of Continuous Integration	
• Difference between Continuous vs Traditional Integration	
• Overview of Jenkins	
• Jenkins Master-Slave Architecture	
• Jenkins Installation and Configuration	
• Jenkins Plugins • Jenkins Management	
• Jenkins Freestyle and Pipeline Jobs	

• Scripted and Declarative Pipelines	
• Configuring Slave Node to Jenkins	
Practical Includes:	
1. Installation and Configuration of Jenkins	
2. Configuration of Tools	
3. Configuration of Plugins	
4. Creation of Freestyle Jobs, scripted and declarative pipeline jobs	
5. Demonstrate pipeline triggering using Github webhooks	
6. Scripted and Declarative pipelines	
7. Integration of Code Coverage Tools and Static Code analysis tools	
8. Triggering pipelines using Git WebHooks	
9. Creation of CICD pipelines	
10. Adding slave node to Jenkins	
Module 5	**Total:10.5hrs**
Containerization, Docker, and Docker Hub	**6.5hrs**
• Introduction to Virtualization and Containerization	
• What is Containerization	
• Docker Architecture	
• Overview of Docker Hub	
• Docker Installation	
• Docker Commands	
• Container Modes	
• Port Binding	
• Docker file	
• Managing Docker Images	
• Running and Managing Containers	
• Docker Volume	
• Docker Compose	
• Overview of Docker Swarm	
Practical Includes:	
1. Installation of Docker and Docker Compose on AWS EC2	
2. Running Docker Commands	
3. Writing Docker Files for various applications	
4. Building Docker Images	
5. Pushing Images to Docker Hub	
6. Running Docker Containers,	
7. Container Port Binding	
8. Running multiple containers using Docker Compose file	

9. Persisting container data using Docker Volume.	
10. Initialize a docker swarm and demonstrate workload deployments	
Container Orchestration Tool - Kubernetes	**4hrs**
• Overview of Container Orchestration	
• Different between Docker swarm and Kubernetes Cluster	
• Kubernetes Architecture	
• Installation of Kubernetes – Minikube and EKS	
• Kubernetes Nodes	
• Kubernetes Pods	
• Kubernetes Deployments	
• Rolling updates and rollbacks	
• Scaling up and down of the application	
• Services in Kubernetes	
Practical Includes:	
1. Installation and configuration of Kubernetes Minikube	
2. Creation of Pods and Deployments using ad-hoc Commands	
3. Creation of Pods and Deployments using YAML files	
4. Scaling up and Scaling Down of the application	
5. Rolling out Deployments and Rolling Back	
6. Creation of Services	
Module 6	**Total: 9hrs**
Configuration Automation using Ansible	**5hrs**
• Overview of Configuration Automation	
• Introduction to Ansible	
• Ansible Architecture	
• Components of Ansible	
• Installation and Configuration of Ansible	
• Ansible ad-hoc commands	
• Ansible Playbooks	
• Ansible Variables	
• Ansible Handlers	
• Ansible Role using Ansible Galaxy	
Practical Includes:	
1. Installation and Configuration Ansible	
2. Running Ansible ad-hoc commands.	
3. Writing Ansible Playbooks to Configure Servers	
4. Creating Ansible Roles	
Terraform Overview	**4hrs**

• Introduction to Terraform	
• Terraform Vs Ansible	
• Terraform Architecture	
• Terraform Configuration	
• Terraform Commands	
• Managing Terraform Resources	
• Terraform End to End Project	
Practical's Includes:	
1. Installation of Terraform on AWS EC2 Instance	
2. Writing Terraform Configuration	
3. Creation of AWS EC2 instance using terraform	
4. Managing AWS resources using terraform	
5. End to End Infrastructure Creation Project.	
Module 7	**Total :5hrs**
Continuous Monitoring using Prometheus and Grafana	**5hrs**
• Overview of continuous monitoring	
• Continuous monitoring tools in DevOps	
• Installation and Configuration of Prometheus and Grafana	
• Prometheus Architecture	
• Monitoring using Prometheus	
• Dashboard visualization using Grafana	
Practical Includes:	
1. Installation and Configuration of tools	
2. Monitoring Targets using Prometheus	
3. Visualizing Reports using Grafana	
Capstone Project	**Total :10hrs**
Projects	**10hrs**
1. Project 1: Finance Me - Finance and Banking Domain	
2. Project 2: Medi cure - Health Domain	
3. Project 3: Insurance Me - Insurance Domain	
Overall Q&A session	**25hrs**
Orientation session	**2hrs**