**Module 1 : Application Development Fundamentals** 12 Hours

* + Overview of Application Development
  + Various Types of Application
  + Introduction Microservices
  + Introduction to Databases
  + Multi-tiered application architecture
  + Introduction to Java
  + Java Architecture
  + Compiling Source Code and Packaging Applications
  + Java Console based and Web based Applications
  + Deployment and Consuming Java Applications
  + OOPs Concept
  + Introduction to Python
  + Python Architecture
  + Execution of Python Applications
  + Python Console based and Web based Applications
  + Deploying and Consuming Python Applications

**Practical Includes :**

1. Installation of Eclipse
2. Creation of Simple Java Project
3. Creation of Dynamic Web Project
4. Creating Spring Boot Application
5. Compilation and Execution of application

**Module 2 : Structure Query Language (SQL) 4 Hours**

* + 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 2 : AWS Fundamentals**  10 Hours

* + 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

**Module 3 : Linux Fundamentals**  6 Hours

* 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 Programs

**Module 4 : DevOps Overview** 4 Hours

* 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

**Module 5 : Managing Source Code – Git and GitHub** 6 Hours

* 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 6 : Understanding and Using Build Tools** 4 Hours

* Overview of Various Build Tools
* What is Maven
* Maven Architecture
* Maven Plugins
* Maven Archetypes
* Maven Commands
* 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

**Module 7 : Continuous Testing with Selenium**  5 Hours

* Overview of Continuous Testing
* Software Testing Life Cycle
* Different Types of Testing
* Test-Driven Development Approach using Junit
* 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

**Module 8 : Continuous Integration Using Jenkins**  6 Hours

* 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
* 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
5. Creation of CICD pipelines
6. Adding slave node to Jenkins

**Module 11 : Containerization, Docker, and Docker Hub 6 Hours**

* Introduction to Virtualization and Containerization
* Introduction to Monolithic and Microservice Architecture
* What is Containerization
* Docker Architecture
* Overview of Docker Hub
* Docker Installation
* Docker Commands
* Container Modes
* Port Binding
* Dockerfile
* Managing Docker Images
* Running and Managing Containers
* Docker Volume
* Docker Compose

**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.

**Module 12 : Container Orchestration Tool : Kubernetes 4 Hours**

* + Overview of Container Orchestration
  + Different between Docker swarm and Kubernetes Cluster
  + Kubernetes Architecture
  + Installation of Kubernetes – Minikube
  + 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 10 : Configuration Automation using Ansible 5 Hours**

* + 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

**Module 13 : Continuous Monitoring using Prometheus and Grafana 5 Hours**

* 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

**Module 14 : DevOps on Cloud ( AWS)** 4 Hours

* + Overview of AWS DevOps
  + Code Commit,
  + Cod Build,
  + Code Deploy
  + Code Pipeline
  + Working with Cloud Formation

**Module 15 : Terraform Overview** 4 Hours

* + 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 16 : Capstone Project Live Demo**  10 Hour

1. Project 1 :
2. Project 2 :
3. Project 3 :

**Module 17 : Interview Preparation**  2 Hours

**Module 18 : Certification Projects and Submission**