

Python-DevOps (10 Weeks – Part-time)

Pre-requisites:

Participants joining the program should:

- Have prior experience in working on a programming language
- Have good knowledge on fundamentals such as programming logic and techniques, basic data structures and algorithms
- Good understanding and knowledge of networking fundamentals
- Have experience in working on Linux and able to build shell scripts
- Can communicate and understand spoken and written English and is able to clear the calibration (KBA)

Learning Effort

10-12 Hours a Week (Two VILT Sessions (4 Hrs) + Hands-on Assignments (6-8 Hours))

Indicative Design

Module	Duration (in Weeks)	Topics / Areas Covered
Stage 1: Programming with Python		
Python Programming	2	Basic Python Programming, Learning Programming with Python, Data Types and Flow Control, Using Values and Variables, Identifiers, Expressions and Conditional Statements, Loops and Iteration, Using Functions Modules and Packages, Dictionary and File Ops, Scripting in Python.
Introduction to DevOps, Cloud Computing	1	Understanding Infrastructure Management Services, What is DevOps and the Need, Use in IT Infrastructure Management, The DevOps Lifecycle and Work Flow, Roles, Responsibilities, and Skills of a DevOps Engineer, IaaS, PaaS, Serverless Computing.
Infrastructure Management and Cloud Management (GCP) with OpenStack	2	Use of Automation Tools; Understanding Cloud Computing and Cloud Services; Attributes and Characteristics of Cloud, Need for On-Demand Services, Cloud Categories, Delivery Models, Evolution, Cloud Types and Solutions, Cloud Architecture and DFF, Managing Cloud Services; Virtualization Basics, Overview of GCP: Overview of GCP; GCP Basics of different services; Functionality offered by GCP; Features of GCP service; GCP web services; Cloud IAM; Cloud Run; VPC Basics; Compute Engine; Cloud CDN; Google Cloud Pub/Sub, GKE, Cloud Formation, and the Google Command Line Interface (CLI) – gcloud, Overview containers and Kubernetes GKE / Container Engine, Deploy containers on Kubernetes cluster, CI/CD on Cloud with Jenkins – X, Creating OpenStack on Linux; OpenStack and Git; OpenStack with DevStack; OpenStack Instant generation, Swift/Sinder/Horizon/Glance, Integration with Hypervisor/VMware, OpenStack Orchestration and Dashboards, Storage etc.
Containerization & Virtualization	2	Virtualization Basics, Virtualization with Vagrant; Container Technology, Container orchestration, Create and Manage containerized services using Docker, Use existing container images to create and manage containerized services (Microservices architectures). Container registries; Basics of Kubernetes, Installation and Configuration, Understanding Kubernetes Architecture, Kubernetes Objects and Object Management. Istio and Helm / Operators; Cluster Networking; Ingress Controllers; RBACs;
CI/CD Pipeline	1	Learn Automation basics, Git / Gerrit, Software build tools like distCC, Use Gitlab and repository for cloning and forking;, Creating CI Pipeline – Gitlab Runner, defining test and delivery stages, Continuous Deployment / Delivery, working with test results and pipeline, Use Jenkins and Docker Understanding Jenkins, Jenkins file, Job chaining and visualization, Using Shared libraries, Running Jenkins in a Docker container, Deploying Jenkins using Kubernetes, Pipeline Development tools, Package management, Managing Users, Jenkins security considerations, Declarative and Scripted Pipelines;
Stage 2: Capstone Project		
Case Study Project	2	Complete a defined project in small agile teams. Note: Final Project will be a Sample Application Deployment Case Study Paper Presented assimilating the learnings in the form of a demo/presentation.