TOC – Infrastructure as code using Terraform and GitHub Integration

(4 days – 32 hours)

Module 1: Fundamentals of IAC with Terraform

- Introduction to Infrastructure as Code
- Terraform for Azure and Its use cases
- Writing and Executing Terraform Scripts for Azure
- Managing Azure Resources with Terraform

Module 2: Getting started with Terraform

- Installation of Terraform on Windows
- Understanding Terraform Providers
- Authenticate Azure with Terraform
- Setting Up Terraform on Windows and Azure Authentication
- Basic Terraform commands: init, plan, apply
- Defining Provider & Using Basic Terraform commands

Module 3: Building Cloud Infrastructure with Terraform

- Creating Resource Groups in Azure
- Provisioning Virtual Networks, Subnets, Public IPs, and Network Interfaces
- Deploying Windows and Linux VMs
- Configuring Azure Storage, Security Groups, and Load Balancers
- Understanding Terraform State file
- Understanding Working of State file – Desired State & Current State
- Terraform Provider Versioning
- Methods to define Terraform Provider Versions

Module 4: Read, Generate, Modify Configurations

- Understanding Attributes and Output Values in Terraform
- Handling Terraform attributes and output values
- Referencing attributes across resources
- Understanding Terraform Variables and Data Types – (String, Number, Boolean, List, Map)
- Methods to Define Variables & Variable Arguments
- Fetching Data from List & Map in Variables
- Understanding Meta-Arguments – (for each & count)
- Using Meta-Arguments
- Understanding conditional expression and locals
- Using Conditional expression and Locals
- Understanding Expressions – for & Splat expression
- Using for and Splat expression
- Understanding Data Sources & Dynamic Blocks
- Using Data Sources
- Using Dynamic Blocks
- Exploring debugging techniques in Terraform
- Terraform Commands – validate, fmt
- Using terraform validate and terraform fmt
- Replacing Resource in terraform manually – taint and replace
- Using Terraform Graph utility
- Saving Terraform Plan to a file and apply from plan file

Module 5: Terraform Provisioners

- Understanding provisioners in Terraform
- Understanding Connection Block
- Types of provisioners
- Implementing file, remote-exec and local-exec provisioners

Module 6: Terraform Modules & Workspaces

- Applying the DRY (Don't Repeat Yourself) principle
- Understanding Usage of Terraform Modules
- Standard Structure of Terraform Modules
- Creating and Using local Modules
- Utilizing Modules from Terraform Registry

- Understanding and implementing Terraform workspaces
- Working with Terraform Workspaces

Module 7: Introduction to GitHub & Administration

- What is GitHub
- Components of the GitHub flow
- GitHub is a collaborative platform
- GitHub platform management
- What is GitHub administration
- How does GitHub authentication work
- How does GitHub organization and permissions work

Module 8: Introduction to GitHub Actions for Azure and IAC

- What are GitHub Actions for Azure
- Use GitHub Actions to connect to Azure (Authentication Methods)
- Deploy to Azure infrastructure with GitHub Actions