# Managing Azure with Terraform

- 3 Days
- Lecture and Hands-on Labs
- Includes all objectives found on HashiCorp's Terraform Associate Certification

## Course Overview

As enterprises seek to deploy and maintain increasingly complex Azure cloud infrastructure, there is a necessity to use "Infrastructure as Code" (IaC) tools, like Terraform. An open-source, state management tool developed by HashiCorp, Terraform allows developers to use a common coding interface to work through their various clouds safely and efficiently. Attendees will leave being able to write and understand Terraform code (HCL), have a clear understanding of Terraform's various components and supporting tools, as well as when to reach for Terraform over another IaC tool, such as Ansible.

## Who Should Attend

- DevOps Engineers
- Software Developers
- Technical Managers and Leads
- System and Cloud Administrators
- Network Engineers and Developers

## What You'll Learn

- Writing Terraform HCL code for managing Azure
- Deploying into Azure
- Where Terraform fits in the Enterprise CI/CD model
- Differences between Terraform and Ansible
- Best practices
- Prepare for HashiCorp's Terraform Associate Certification
- AI LLM prompt engineering for Terraform snippets and jumpstarting solutions

## Outline

AI LLM Toolkit

- 💻 Lecture + Lab: Large Language Model toolkit for AI Solution Assistance

Introduction to Terraform

- 💬 Lecture: Terraform Course Map
- 💬 Lecture: Introduction to Terraform and Azure

Software Control Management

- 💻 Lecture + Lab: SCM Option #1 - GitHub
- 💻 Lecture + Lab: SCM Option #2 - GitLab

Overview of Terraform

- 💻 Lecture + Lab: Terraform Install

Terraform Modules

- 💬 Lecture: Terraform HCL Syntax
- 💻 Lecture + Lab: Up and Running with Terraform
- 💻 Lecture + Lab: Terraform Variables
- 💻 Lecture + Lab: Output Values
- 💬 Lecture: Avoid the :latest Tag

Azure

- 💬 Lecture: Managing Azure with Terraform
- 💻 Lecture + Lab: Terraform and Azure
- 💬 Lecture: Exploring Terraform Azure modules
- 💻 Lecture + Lab: Starting with VNet
- 💻 Lecture + Lab: Creating Virtual Machines
- 💻 Lecture + Lab: Tracking State with Storage and Databases
- 💻 Lecture + Lab: Creating an Azure Module

Beyond Basics

- 💻 Lecture + Lab: Terraform CLI Workspaces
- 💻 Lecture + Lab: Terraform Expressions and Errors
- 💻 Lecture + Lab: Resources - replace vs taint
- 💻 Lecture + Lab: Dynamic Operations with Functions
- 💻 Lecture + Lab: Creating a Terraform Module
- 💻 Lecture + Lab: Moving State - terraform state mv
- 💻 Lecture + Lab: Dynamic Provisioning with tfvars Files
- 💻 Lecture + Lab: Data Sources and HTTP Provider

Loops

- 💬 Lecture: for_each
- 💻 Lecture + Lab: Looping Constructs - for_each

Provisioning

- 💻 Lecture + Lab: local-exec Provisioner
- 💻 Lecture + Lab: Creating Delays
- 💻 Lecture + Lab: Terraform - templatefile Function

Terraform Cloud

- 💻 Lecture + Lab: Terraform Cloud and Terraform Enterprise
- 💻 Lecture + Lab: Triggering Cloud Builds via Git Commits

Dynamic Blocks

- 💻 Lecture + Lab: Dynamic Blocks

Terraform and Enterprise

- 💻 Lecture + Lab: Deploy a Go RESTful API microservice with Terraform
- 💬 Lecture: Terraform vs. Ansible
- 💻 Lecture + Lab: Terraform and Ansible

Helpful DevOps Tools (OPTIONAL)

- 💻 Lecture + Lab: GitHub Actions - GitLeaks
- 💻 Lecture + Lab: GitHub Actions - Terraform

Terraform Review

- 💬 Lecture: HashiCorp Terraform Study Guide

## Prerequisites

Although not required, students with some experience programming, or pre-existing knowledge of Azure or other cloud architecture, will most appreciate the technical nature of this hands-on course.

## Next Courses

- Jenkins Automation Server Essentials (2 days)
- Ansible Essentials (5 days)
- Go Essentials (5 days)
- Git and GitHub (2 days)
- Git and GitLab (2 days)

## Certification

- Managing Azure with Terraform - Certification Project