

Terraform with Azure – 4-Month Project-Based Roadmap

This roadmap is designed to take a learner from beginner to senior-level expertise in Terraform with Azure as the cloud provider. It spans 4 months, organized by monthly themes. Each project progressively builds on the previous one, incorporates industry best practices, CI/CD integration, and requires exploring Azure resources via Portal and CLI before codifying with Terraform.

Month 1 – Foundations (Networking & Compute)

Provision Resource Group & Storage Account

Requirement: Set up Resource Group + Storage Account as a remote state backend.

Azure Resources to Learn: Resource Groups, Storage Accounts, Access Keys

CI/CD Layer: Basic GitHub Actions pipeline: terraform fmt, validate, init, plan.

Best Practices: Remote state storage, tagging conventions, secure backend secrets in Key Vault.

Build Virtual Network with Subnets & NSG

Requirement: Create VNet + Subnets + secure traffic with NSG.

Azure Resources to Learn: VNets, Subnets, NSGs

CI/CD Layer: Add linting + terraform plan to pipeline.

Best Practices: Introduce modules, variables, and environment-specific tfvars.

Deploy VM with Networking

Requirement: Launch a Linux VM inside subnet + NSG with Public IP.

Azure Resources to Learn: Virtual Machines, NICs, Public IPs

CI/CD Layer: Pipeline deploys dev workspace automatically.

Best Practices: Use locals for naming, RBAC for VM access, secure SSH keys in Key Vault.

Multi-Environment Setup

Requirement: Use Terraform workspaces to manage Dev/QA/Prod for VM + VNet infra.

Azure Resources to Learn: Previously used resources

CI/CD Layer: Add environment-based pipelines with workspace selection.

Best Practices: Tagging by environment, cost alerts, workspace segregation.

Month 2 – PaaS Services (App Hosting & Databases)

Deploy App Service with Azure SQL

Requirement: Host a web app on App Service with Azure SQL backend.

Azure Resources to Learn: App Services, App Service Plans, Azure SQL Database

CI/CD Layer: Add pipeline secret integration with Key Vault.

Best Practices: Store DB credentials in Key Vault, secure networking, outputs for connection strings.

Scalable App Behind Load Balancer

Requirement: Deploy VM Scale Set behind Azure Load Balancer.

Azure Resources to Learn: Load Balancer, VM Scale Sets

CI/CD Layer: Introduce manual approval before prod deployment.

Best Practices: Reusable compute module, auto-shutdown dev/test, health probes in LB.

Month 3 – Containers & Event-Driven Workloads

Deploy AKS Cluster with ACR

Requirement: Deploy AKS cluster + push image to ACR.

Azure Resources to Learn: AKS, ACR

CI/CD Layer: Pipeline pushes container image + deploys infra.

Best Practices: RBAC-enabled AKS, network policies, kubeconfig stored in Key Vault.

Secure AKS with Ingress + Application Gateway

Requirement: Ingress via Application Gateway for AKS workloads.

Azure Resources to Learn: Application Gateway, Managed Identities

CI/CD Layer: Deploy helm charts via pipeline after infra.

Best Practices: HTTPS via Key Vault certs, autoscaling policies, NSG-secured workloads.

Event Hub + Azure Functions

Requirement: Event Hub triggers Functions for event processing.

Azure Resources to Learn: Event Hub, Functions, Storage Accounts

CI/CD Layer: Add function deployment step after infra apply.

Best Practices: Zip deployment, Key Vault secrets, Log Analytics integration.

Month 4 – Enterprise Infra (Governance & Monitoring)

API Management + Logic Apps

Requirement: Secure APIs with API Management, integrate with Logic Apps.

Azure Resources to Learn: API Management, Logic Apps

CI/CD Layer: Deploy APIs and workflows via pipeline stages.

Best Practices: RBAC policies, monitoring via Azure Monitor + Log Analytics, policy enforcement.

Enterprise Monitoring & Governance

Requirement: Centralized monitoring + enforce policies across infra.

Azure Resources to Learn: Azure Monitor, Log Analytics, Alerts, Azure Policy

CI/CD Layer: Add policy checks pre-deployment.

Best Practices: Policy as code, diagnostics settings, budgets and cost alerts.

Multi-Region, Multi-Subscription Landing Zone

Requirement: Deploy landing zone with networking, security, governance.

Azure Resources to Learn: Management Groups, Role Assignments, VNets, ExpressRoute/VPN Gateway

CI/CD Layer: Full pipeline with lint, plan, approval, apply for each subscription.

Best Practices: Full modular repo, DR strategy, Terragrunt/monorepo, security baselines.