■ 12-Week Azure AKS Learning Bootcamp (In-Depth)

■ Week 1 – Containers & Kubernetes Foundations

- Install: Docker Desktop, kubectl, minikube, Helm
- Install VS Code with Docker, Kubernetes, YAML extensions
- Learn Pods, ReplicaSets, Deployments, Services
- ■ Lab: Run Nginx with Docker & deploy Pod in minikube

■ Week 2 – Azure Basics for AKS

- Azure Resource Groups, VNets, Subnets
- Azure Container Registry (ACR) – push & pull images
- Azure RBAC & Managed Identities
- ■ Lab: Push custom app image to ACR

■ Week 3 – Create Your First AKS Cluster

- Create AKS with CLI/Terraform/Bicep
- System vs user node pools
- kubectl context authentication
- ■ Lab: Deploy app to AKS & expose with LoadBalancer

■ Week 4 – Helm & Ingress

- Helm chart basics
- Install NGINX Ingress Controller
- TLS setup with cert-manager
- ■ Lab: Deploy React + API app with Ingress + TLS

■ Week 5 – CI/CD with Azure DevOps

- Build & push Docker image via Azure Pipelines
- Deploy to AKS with kubectl in pipeline
- ■ Lab: Multi-stage DevOps YAML pipeline for AKS

■ Week 6 – GitHub Actions & IaC

- IaC with Terraform vs Bicep
- Deploy AKS with GitHub Actions
- ■ Lab: GitHub Actions pipeline to build & deploy app

■ Week 7 – Networking

- Kubenet vs Azure CNI
- Internal vs External Load Balancers
- Azure Application Gateway Ingress Controller
- ■ Lab: Deploy app behind App Gateway Ingress

■ Week 8 – Security

- RBAC & Azure AD Integration
- Pod Identity / Workload Identity
- Secrets with Azure Key Vault
- Network Policies
- ■ Lab: Deploy app with Key Vault secret injection

■ Week 9 – Scaling & Autoscaling

- Horizontal Pod Autoscaler (HPA)
- Cluster Autoscaler
- Node pools with Spot & GPU nodes
- ■ Lab: Load test with JMeter / Azure Load Testing

■ Week 10 – Monitoring & FinOps

- Azure Monitor for Containers
- Prometheus + Grafana setup
- Log Analytics integration
- FinOps: right-sizing, Spot, Reserved nodes
- ■ Lab: Grafana dashboard + cost optimization

■ Week 11 – Service Mesh & Policies

- Istio / Linkerd for service mesh
- Traffic splitting, mTLS
- OPA/Gatekeeper for policies
- ■ Lab: Deploy microservices with Istio routing

■ Week 12 – Capstone Projects

- Project 1: 3-tier microservices app with Ingress, HPA, Key Vault, Prometheus
- Project 2: CI/CD pipeline with ACR + AKS
- Project 3: FinOps monitoring dashboard with Grafana + Azure Monitor

■ Learning Outcomes after 12 Weeks:

- Production-ready AKS deployment skills
- CI/CD automation with Azure DevOps & GitHub Actions
- Secure, scalable, and cost-optimized clusters
- Monitoring, FinOps, and service mesh expertise
- 2–3 portfolio projects for resume/LinkedIn showcase