🚀 Study Roadmap: Cloud-Native Full-Stack Engineer

🧱 Phase 1: Core Architecture & API Design (Month 1–2)

🔹 Modern Application Architecture

Topic	Goal	Resources
Twelve-Factor App	Learn stateless design, config via env, portability	12factor.net
Service-Oriented Architecture (SOA)	Understand loose coupling, service boundaries	Martin Fowler - SOA
API-First Design	Learn Swagger/OpenAPI, design before code	Swagger Docs
FAIR Principles (optional)	For data-heavy systems: Findable, Accessible, Interoperable, Reusable	GO FAIR

✅ **Project**: Build a modular Node.js app using 12-factor principles + Swagger docs

☁️ Phase 2: Cloud Native Fundamentals (Azure Focus) (Month 2–4)

🔹 Azure Cloud Fundamentals

Topic	Skill	Resources
Azure Fundamentals	Core services: VMs, App Services, Functions	Azure Fundamentals
Azure App Service	Deploy Node.js/Next.js	Quickstart Docs
Azure Functions	Event-driven serverless compute	Azure Functions Guide
Azure Kubernetes Service (AKS)	Manage container workloads	AKS Docs
Azure DevOps	CI/CD pipelines, Boards	Azure DevOps Docs

✅ **Project**: Deploy a full-stack Next.js + Express app to Azure using CI/CD pipelines

🔄 Phase 3: DevSecOps + Testing Practices (Month 4–5)

◆ DevSecOps, CI/CD, and Testing

Topic	Skill	Resources
GitHub Actions / Azure Pipelines	Automate tests, builds, deploys	[GitHub Actions Docs](#)
Test-Driven Development (TDD)	Jest, Supertest for Node APIs	[Kent C. Dodds TDD Guide](#)
Security Scanning	Secure your dependencies	[Snyk](#), Dependabot

✅ **Project**: Create a secure, test-driven API with CI/CD & security scanning

🧩 Phase 4: Advanced API Ecosystem & Identity (Month 5–6)

◆ API Security and Management

Topic	Skill	Resources
OAuth 2.0 & OIDC	Secure APIs with industry standard	[OAuth 2.0 Simplified](#)
JWT & Passport.js	Token-based authentication	[Passport.js Guide](#)
API Rate Limiting	Secure APIs	[express-rate-limit](#)
API Gateway Patterns	Manage APIs	[Azure API Gateway](#)

✅ **Project**: Secure microservices using JWT + API Gateway + Rate Limiting

🧠 Phase 5: Infrastructure and Observability (Month 6–7)

◆ IaC and Monitoring

Topic	Skill	Resources
Terraform / Bicep	Infrastructure as Code	[Terraform Azure Docs](#)

Topic	Skill	Resources
Monitoring	Azure Monitor, Log Analytics	Azure Monitor
Logging & Tracing	Winston, Azure logs	Winston Logger

✅ **Project**: Automate cloud infra with Terraform + add monitoring/logging

🌐 Phase 6: System Design & Communication (Month 7–9)

🔹 Soft Skills + Design

Topic	Skill	Resources
System Design	Build scalable systems	System Design Primer
Communication	Lead meetings, docs, feedback	LeadDev Talks
Documentation	Diagrams, Markdown, API Docs	Diagrams.net, Stoplight

✅ **Project**: Design & document a scalable fintech system + present it like a tech lead

🏁 Final Capstone Project (Month 9)

Title: Fintech Microservice Platform on Azure
Stack: Next.js, Node.js (NestJS/Express), Azure Functions, CosmosDB/PostgreSQL, API Gateway, JWT Auth, CI/CD, Monitoring

Deliverables:

- ✅ Microservice architecture
- ✅ 12-Factor principles
- ✅ Secure, scalable API
- ✅ CI/CD + IaC
- ✅ Monitoring + Logging
- ✅ Auth with OAuth2.0
- ✅ System Design Diagram + README

💼 Recommended Certifications

Certification	Benefit	Link
Azure Developer Associate (AZ-204)	Validate Azure dev skills	[AZ-204]
Certified Kubernetes Application Developer (CKAD)	K8s deployment skills	[CKAD]
Terraform Associate	Infra provisioning expertise	[Terraform Cert]

> ✨ **Tip:** Track your progress using Notion, Trello, or GitHub Projects to stay accountable.