

# Development of Cloud Applications

## Requirements

later

## LECTURE STRUCTURE

### L1 - Introduction to Cloud Computing

- Cloud service models (IaaS, PaaS, SaaS)
- Deployment models (public, private, hybrid)
- Shared responsibility model
- Overview of Azure ecosystem

### L2 - Cloud Architecture Principles

- 12-Factor App methodology
- Stateless vs stateful services
- Horizontal scaling
- REST architecture basics

### L3 - Designing Cloud Applications

- Microservices vs monolith
- API-first design
- OpenAPI specification
- Basic system design patterns

### L4 - Containers and Virtualization

- Containers vs VMs
- Docker architecture
- Images, containers, volumes, networks
- Multi-stage builds

### L5 - Cloud Deployment Models in Azure

- Azure App Service
- Azure Container Apps
- Azure Storage (Blob, Table)
- Azure SQL Database

### L6 - DevOps & CI/CD Fundamentals

- Git workflow
- GitHub Actions basics
- Build pipelines
- Infrastructure as Code concept

## **L7 - Security & Identity in Cloud**

- Authentication vs Authorization
- OAuth2 / JWT basics
- Azure Active Directory fundamentals
- Secret management

## **L8 - Cloud Databases & Storage**

- Relational vs NoSQL
- Azure SQL vs Cosmos DB
- Data consistency models
- Migration basics

## **L9 - Serverless Architectures**

- Event-driven systems
- Azure Functions
- Triggers & bindings
- Use cases

## **L10 - Observability & Monitoring**

- Logging principles
- Metrics vs traces
- Azure Monitor & Application Insights
- Health checks

## **L11 - Scalability & Performance**

- Load balancing
- Caching strategies
- CDN basics
- Cost optimization

## **L12 - Resilience & Reliability**

- Retry patterns
- Circuit breaker
- SLA/SLO basics
- Backup strategies

## **L13 - Cloud-Native Trends & Final Architecture Review**

- Kubernetes overview
- Infrastructure as Code (Bicep/Terraform intro)
- Edge computing basics
- Final project architectural consultation

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