

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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