

Cloud Computing Course Syllabus

Total Duration: 90hrs

Module 1

Chapter 1: Introduction to Cloud Computing

1. Definition of Cloud Computing
2. Characteristics of Cloud Computing
3. Benefits of Cloud Computing Over Traditional Computing
4. Service Delivery Models Overview in Cloud Computing
5. Real-World Applications of Cloud Computing

Chapter 2: Cloud Deployment Models

1. Public, Private, and Hybrid Cloud – Definitions
2. Pros and cons of each model
3. Use Case-Based Deployment Decisions
4. Comparison with on-premise environments

Chapter 3: Cloud Service Models

1. Infrastructure as a Service (IaaS)
2. Platform as a Service (PaaS)
3. Software as a Service (SaaS)
4. Practical examples of each

Chapter 4: Virtualization & Hypervisors

1. What is virtualization in cloud computing
2. Hypervisor types: Type 1 and Type 2
3. Virtual machines vs containers
4. Benefits of Virtualization in Cloud Computing

Chapter 5: Overview of Cloud Providers

1. Introduction to AWS, Azure, GCP
2. Core services comparison
3. Free tier offerings
4. When to choose which provider

Chapter 6: Creating Free-tier Cloud Accounts

1. Signing up for AWS, Azure, GCP
2. Navigating cloud dashboards
3. Budget alerts and free-tier limits
4. Security best practices during setup

Chapter 7: Launching & Managing Virtual Machines

1. Creating EC2 (AWS), Azure VM, and Compute Engine
2. Choosing machine types and images
3. Connecting via SSH or browser

Chapter 8: Hosting a Static Website in the Cloud

1. Setting up AWS S3 static hosting
2. Hosting on Azure Blob and GCP Cloud Storage
3. Configuring bucket permissions
4. Mapping custom domains

Chapter 9: CLI and SDK Tools Setup

1. Installing AWS CLI, Azure CLI, GCP SDK
2. Authentication and configuration
3. Performing operations via command line
4. Scripting basics with cloud SDKs (AWS CLI, Azure CLI, GCP CLI)

Chapter 10: Virtual Networks and Security Groups

1. Creating a Virtual Private Cloud (VPC)
2. Subnets, route tables, and gateways
3. Setting up firewalls and security groups
4. Internet access and NAT configuration

Module 2

Chapter 11: Cloud Storage Concepts

1. Object vs Block vs File Storage
2. Use cases and provider equivalents
3. Cloud storage pricing models
4. Data redundancy and durability

Chapter 12: Managing Buckets and Lifecycle Rules

1. Creating S3 buckets and configuring permissions
2. Enabling versioning and lifecycle policies
3. Storage class transition rules
4. Cross-region replication basics

Chapter 13: Introduction to Cloud Databases

1. Cloud SQL vs NoSQL overview
2. Differences between RDS and DynamoDB
3. Firebase Realtime Database basics
4. Use cases for structured vs unstructured data

Chapter 14: Deploying and Managing Cloud Databases

1. Launching RDS MySQL database
2. Creating and querying DynamoDB tables
3. Connecting Firebase to frontend apps
4. Security and backup options

Chapter 15: Load Balancing & Auto Scaling

1. Concepts of load distribution and elasticity
2. Configuring AWS ELB, Azure Load Balancer
3. Creating Auto Scaling groups
4. Scaling policies based on metrics

Chapter 16: Introduction to Containers & Docker

1. What is Docker and why use it

2. Images, containers, Dockerfiles
3. Building and running containers
4. Docker Hub and private registries

Chapter 17: Running Containers in the Cloud

1. Installing Docker on EC2 / Azure VM
2. Pulling and deploying images
3. Networking and volumes in containers
4. Exposing ports and accessing apps

Chapter 18: Monitoring Cloud Resources

1. Introduction to CloudWatch and Azure Monitor
2. Creating custom metrics and alarms
3. Viewing logs and setting retention
4. Performance monitoring dashboards

Chapter 19: Serverless Computing & IAM

1. Introduction to AWS Lambda / Azure Functions
2. Writing and deploying serverless functions
3. Identity and Access Management (IAM) concepts
4. Creating roles, policies, and access controls

Chapter 20: CI/CD and Full-Stack Cloud Deployment (Final Project)

1. Setting up GitHub Actions for CI/CD
2. Backend deployment using serverless functions
3. Frontend + DB integration with IAM permissions
4. Monitoring and cost optimization