Cloud Computing – Course Syllabus

Course Code: CS-XXX
Credits: 3
Duration: 12–14 Weeks
Level: Undergraduate (or Postgraduate)

Course Objectives:

- Understand the fundamental concepts of cloud computing and service models (IaaS, PaaS, SaaS).
- Explore the architecture, deployment models, and applications of cloud technologies.
- Learn virtualization and containerization techniques used in the cloud.
- Evaluate popular cloud platforms like AWS, Azure, and IBM Cloud.
- Understand security, privacy, and regulatory issues in cloud environments.
- Design and deploy scalable cloud-based solutions.

Module-wise Breakdown:

Week	Module Title	Topics
1	Introduction to Cloud Computing	Definition, Evolution, Characteristics, Benefits, Challenges
2	Cloud Service Models	IaaS, PaaS, SaaS – Concepts & Examples
3	Cloud Deployment Models	Public, Private, Hybrid, Community
4	Virtualization in Cloud	Types of Virtualization, Hypervisors, VMs
5	Containerization	Docker, Kubernetes, Container vs VM
6	Cloud Storage & Databases	Object storage, Block storage, DBaaS
7	Cloud Providers Overview	AWS, Azure, GCP, IBM Cloud – Key Services
8	Cloud Security	Threats, Authentication, Encryption, Compliance
9	Cloud Resource Management	Auto-scaling, Load Balancing, Monitoring
10	Serverless Computing	Lambda, Functions as a Service (FaaS)
11	Cloud-Based Applications	Real-time examples: Netflix, Zoom, Dropbox
12	Cost Management in Cloud	Billing, Pricing Models, TCO Calculation
13	Case Studies / Tools	Hands-on: AWS EC2, IBM Cloud CLI, Azure Portal
14	Project Presentations & Review	Final review, group project demo

Assessment Methods:

- Quizzes – 10%
- Mid-term Exam – 20%
- Lab Exercises – 20%
- Final Project – 30%
- Attendance & Participation – 5%
- Final Exam – 15%

Suggested Readings & Tools:

Books:
• Cloud Computing: Concepts, Technology & Architecture by Thomas Erl
• Cloud Computing: Principles and Paradigms by Rajkumar Buyya
Tools/Platforms:
• AWS Educate
• IBM Cloud Lite
• Microsoft Azure Free Tier
• Docker, Kubernetes, GitHub

Learning Outcomes:

- Explain cloud concepts and architecture.
- Compare cloud providers and services.
- Demonstrate cloud deployment using real tools.
- Secure and manage cloud resources.
- Build a small-scale cloud-based application.