Course Title: Cloud Computing with AWS

Course Description:

This course explores the fundamental concepts of cloud computing with a specific focus on Amazon Web Services (AWS), the leading cloud service provider. Students will learn about AWS core services, architecture, security, and best practices, and will gain hands-on experience through practical labs and projects.

Course Objectives:

- Understand the key concepts of cloud computing.
- Learn about AWS core services including EC2, S3, RDS, Lambda, and more.
- Master the AWS management console and CLI.
- Design and deploy scalable, highly available, and fault tolerant systems on AWS.
- Understand AWS security measures and best practices.
- Develop skills in cloud architecture and solutions design.

Prerequisites:

- Basic knowledge of networking concepts.
- Familiarity with fundamental principles of IT services.
- Prior programming experience can be helpful but is not required.

Weekly Syllabus Outline:

Week 1: Introduction to Cloud Computing

- Definition and characteristics of cloud computing.
- Service models (IaaS, PaaS, SaaS) and deployment models (Public, Private, Hybrid).
- Benefits and challenges of cloud computing.

Week 2: Getting Started with AWS

- Overview of AWS services and global infrastructure.
- Setting up an AWS account.
- Introduction to the AWS Management Console and AWS CLI.

Week 3: Amazon EC2 and EBS

- Understanding Amazon EC2 and instances.
- Configuring and managing EC2 instances.
- Introduction to Elastic Block Store (EBS).

Week 4: Amazon S3 and Glacier

- Understanding Amazon S3 for storage.
- Creating and managing S3 buckets.
- Introduction to Glacier for long-term storage.

Week 5: Amazon RDS and DynamoDB

- Introduction to Amazon RDS.
- Setting up and managing a relational database.
- Basics of DynamoDB as a NoSQL solution.

Week 6: Networking in AWS

- Introduction to Amazon VPC.
- Subnetting, Security Groups, and ACLs.
- Amazon Route 53 for DNS management.

Week 7: AWS Security Measures

- AWS Identity and Access Management (IAM).
- Best practices for securing AWS resources.
- Understanding AWS compliance and assurance programs.

Week 8: Serverless Architectures with AWS Lambda

- Understanding AWS Lambda.
- Building and deploying serverless applications.
- Integration with other AWS services.

Week 9: AWS Application Integration Services

- Overview of SQS, SNS, and SWF.
- Decoupling applications using AWS messaging services.
- Hands-on lab on message queuing and notification.

Week 10: Monitoring and Management

- Introduction to Amazon CloudWatch.
- Monitoring AWS resources and applications.
- Automation using AWS Auto Scaling and Elastic Load Balancing.

Week 11: Architecting on AWS

- Best practices for cloud architecture.
- Designing fault tolerant and high availability systems.
- Cost optimization strategies.

Week 12: Developing and Deploying

- Introduction to AWS Elastic Beanstalk.
- Deployment models and managing application environments.
- Integrating DevOps practices with AWS.

Week 13: Disaster Recovery and Backup

- Strategies for backup and disaster recovery.
- Using AWS services for backup and DR scenarios.
- Hands-on lab on setting up backup routines.

Week 14: Capstone Project

- Project proposal phase focusing on a real-world AWS-based solution.
- Implementation phase using learned AWS services.
- Applying best practices for security and performance.

Week 15: Project Presentations and Course Wrap-Up

- Final project demonstrations.
- Peer and instructor feedback.
- Course review and final assessments.

Assessment Methods:

- Weekly hands-on labs and assignments.
- Quizzes to review key concepts from each module.
- A capstone project requiring the design and deployment of an AWS-based solution.