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| COURSE TITLE | PUBLIC CLOUD-I |
| COURSE CODE | 05CA0401 |
| COURSE CREDITS | 4 |

Objective:

- 1 Understand the concepts and procedures involved in installing and configuring cloud environments using Microsoft Azure
- 2 Explain the principles and applications of Infrastructure as a Service (IaaS) in cloud computing
- 3 Demonstrate the ability to configure and manage cloud environments using Amazon Web Services (AWS)

Course Outcomes: After completion of this course, student will be able to:

- 1 Describe the fundamental concepts and architecture of Amazon Web Services (AWS).
- 2 Explain the various AWS storage services (e.g., S3, EBS, Glacier) and their use cases
- 3 Apply the knowledge of AWS Technical Essentials to configure and manage basic AWS infrastructure.

Pre-requisite of course:NA

Teaching and Examination Scheme

| Theory Hours | Tutorial Hours | Practical Hours | ESE | IA | CSE | Viva | Term Work |
|---------------------|-----------------------|------------------------|------------|-----------|------------|-------------|------------------|
| 3 | 0 | 2 | 50 | 30 | 20 | 25 | 25 |

| Contents : Unit | Topics | Contact Hours |
|------------------------|---|----------------------|
| 1 | AMAZON WEB SERVICES AWS structure and organization, AWS Account and Services Layer, , EC2 AMIs and Virtualization, EC2 Purchasing Options, EC2 Placement Groups, Instance Details and Bootstrapping | 10 |
| 2 | AWS STORAGE SERVICES Storage Services: S3 Essentials, S3 Components, Website Hosting with S3, Glacier, Transferring Data into S3 | 10 |
| 3 | AWS TECHNICAL ESSENTIALS VPC Network Routing Basics, VPC Security Basics, Elastic Load Balancing, Route 53 Essentials, , Route 53 DNS Failover | 15 |
| 4 | AWS CLOUD WATCH Cloud Watch Essentials, Network Flow logs., VPC Flow Logs and Access Logs, Introduction to Service Oriented and Server less Architectures, Lambda Essentials | 10 |
| Total Hours | | 45 |

Suggested List of Experiments:

| Contents : Unit | Topics | Contact Hours |
|--------------------|--|---------------|
| 1 | Unit 1 Create an AWS account and explore the AWS Management Console, Launch an EC2 instance, connect via SSH, and install a web server, Explore EC2 AMIs (Amazon Machine Images) and create a custom AMI, Configure EC2 Placement Groups and test network performance, Automate EC2 setup using Bootstrapping scripts with User Data | 15 |
| 2 | Unit 2 Create an S3 bucket and upload/download files using AWS Console & CLI, Enable Static Website Hosting on S3 and configure public access, Implement Lifecycle Policies in S3 for data transition to Glacier, Use AWS CLI to transfer data into an S3 bucket, Configure S3 bucket policies and permissions for access control. | 15 |
| 3 | Unit 3 Create a VPC with a custom IP range and test basic network routing, Implement Security Groups and Network ACLs in a VPC, Deploy an Elastic Load Balancer (ELB) and distribute traffic across EC2 instances, Register a custom domain with Route 53 and configure DNS records. Implement Route 53 DNS Failover for high availability | 15 |
| 4 | Unit 4 Configure AWS CloudWatch Alarms for EC2 instance monitoring, Enable and analyze VPC Flow Logs to monitor network traffic, Set up CloudWatch Logs to track server performance, Deploy a Lambda function to execute a scheduled task, Use AWS CloudWatch Metrics to analyze CPU and memory usage | 15 |
| Total Hours | | 60 |

Textbook :

- 1 Public Cloud Computing: Architecture & Applications, Rajkumar Buyya, Morgan Kaufmann, 2021
- 2 Cloud Computing: Concepts, Technology & Architecture, Thomas Erl, Pearson Education, 2020

References:

- 1 Cloud Computing: Principles and Paradigms, Cloud Computing: Principles and Paradigms, Rajkumar Buyya & James Broberg, Wiley, 2011
- 2 Mastering Cloud Computing: Foundations and Applications, Mastering Cloud Computing: Foundations and Applications, Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, McGraw Hill Education, 2013

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery

| Remember / Knowledge | Understand | Apply | Analyze | Evaluate | Higher order Thinking / Creative |
|-----------------------------|-------------------|--------------|----------------|-----------------|---|
| 20.00 | 30.00 | 25.00 | 15.00 | 10.00 | 0.00 |

Instructional Method:

- 1 Board Work
- 2 PPT
- 3 DEMO

Supplementary Resources:

- 1 <https://www.w3schools.com/aws/>