AMAZON WEB SERVICES(AWS)

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – VII

Subject Code	:		**Credits**	:	03
Hours / Week	:	03 Hours	**Total Hours**	:	39 Hours
L–T–P–S	:	3–0–0–0			

Course Learning Objectives:

1. **Understand** fundamental of CloudComputing and Amazon Elastic Compute Cloud and Amazon Elastic Block Store using AWS Platform
2. **Devise** the process of services Storage and Virtual Private Cloud in AWS.
3. **Develop** the Database services in AWS platform.
4. **Recognize** the importance of Authentication and Authorization of Security in AWS.
5. **Apply** Domain Name System and Network Routing for an EC2 Web Server.

Teaching-Learning Process (General Instructions)

These are sample new pedagogical methods, where teacher can use to accelerate the attainment of the various course outcomes.

1. ***Lecture method*** means it includes not only traditional lecture method, but different *type of teaching methods* may be adopted to develop the course outcomes.
2. ***Interactive Teaching:*** *Adopt the* ***Active learning*** that includes brainstorming, discussing, group work, focused listening, formulating questions, notetaking, annotating, and roleplaying.
3. Show ***Video/animation*** films to explain functioning of various concepts.
4. Encourage ***Collaborative*** (Group Learning) Learning in the class.
5. To make ***Critical thinking***, ask at least three Higher order Thinking questions in the class.
6. Adopt ***Problem Based Learning***, which fosters students' Analytical skills, develop thinking skills such as the ability to evaluate, generalize, and analyse information rather than simply recall it.
7. Show the ***different ways to solve*** the same problem and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every ***concept can be applied to the real world*** - and when that's possible, it helps improve the students' understanding.

UNIT – I	**08 Hours**

Introduction: Introduction to Cloud Computing and AWS: Cloud Computing and Virtualization, Cloud Computing Optimization, The AWS Cloud, AWS Platform Architecture, AWS Reliability and Compliance, Working with AWS, Amazon Elastic - Compute Cloud and Block Store: EC2 Instances, EC2 Storage Volumes, EC2 Auto Scaling, AWS Systems Manager, AWS CLI Example.

Textbook 1- Chapter 1:3-14, Chapter 2:21-51

UNIT – II	**08 Hours**

Storage and Virtual Private Cloud: AWS Storage – S3 architecture, Durability and Availability, Object Lifecycle, Accessing S3 objects, Amazon S3 Glazier, other storage, AWS CLI Example, VPC – CIDR blocks, Subnets, Elastic Network Interfaces, Internet Gateways, Route Tables, Security groups, Network Access Control Lists, Public IP Addresses, Elastic IP Addresses, NAT, VPC peering.

Textbook 1: Chapter 3: 59-75, Chapter 4:83-114

UNIT – III	06 Hours
Database Services: Relational databases, Amazon RDS, Amazon Redshift, Nonrelational Databases (NoSQL), Dynamo DB **Textbook 1: Chapter 5: 133-158**	
UNIT – IV	**09 Hours**
Authentication and Authorization, Cloud Trial, Cloud Watch: IAM, Authentication tools, Cloud Trial – Management Events, Data Events, Trials, Log File Integrity Validation, CloudWatch – CloudWatch Metrics, Graphing Metrics, Metric Math, CloudWatch Logs, CloudWatch Alarms. **Textbook 1: Chapter 6: 165-175, Chapter 7:183-198**	
UNIT – V	**07 Hours**
DNS, Network Routing, SQS: The Domain Name System, Amazon Route 53, Amazon CloudFront, AWS CLI Example, Simple Queue Service -Queues, Types, Polling, Dead letter queues, Kinesis – Video streams, Data Streams, Data Firehouse, Kinesis Data Firehose vs. Kinesis Data Streams. **Textbook 1: Chapter 8: 211-225, Chapter 9:233-239**	

Course Outcome	Description	Bloom's Taxonomy Level
At the end of the course the student will be able to:		
CO1	Utilize the fundamental concepts of Cloud computing, Amazon EC2, load balancing and Auto scaling in developing AWS cloud platform.	L3
CO2	Examine the services Storage and Virtual Private Cloud runs on AWS platform.	L3
CO3	Design and develop the latest Database Services on AWS Platform.	L3
CO4	Develop Amazon Authentication and Authorization, CloudTrial, Cloud Watch using AWS tools.	L3
CO5	Apply DNS, Network Routing, SQS.	L4

Table: Mapping Levels of COs to POs / PSOs

COs	Program Outcomes (POs)												PSOs	
	1	2	3	4	5	6	7	8	9	10	11	12	1	2
CO1	3	2	3	0	3	0	0	0	0	0	0	3	2	1
CO2	3	2	3	0	3	0	0	0	0	0	0	3	2	1
CO3	3	2	3	0	3	0	0	0	0	0	0	3	2	1
CO4	3	2	3	0	3	0	0	0	0	0	0	3	2	1
CO5	3	2	3	0	3	0	0	0	0	0	0	3	2	1

3: Substantial (High) **2: Moderate (Medium)** **1: Poor (Low)**

TEXT BOOKS:

1. Ben Piper, David Clinton, "AWS Certified Solutions Architect Study Guide: Associate SAA-C02 Exam (Aws Certified Solutions Architect Official: Associate Exam)" – February 2021.

REFERENCE BOOKS:

1. Learning Amazon Web Services (AWS): A Hands-On Guide to the Fundamentals of AWS Cloud, Mark Wilkins, Pearson Education, November 2019.
2. AWS Certified Cloud Practitioner, by Anthony J. Sequeira, Pearson Education, August 2020.

E-Resources:

1. https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html
2. https://docs.aws.amazon.com/AmazonS3/latest/userguide/Welcome.html
3. https://docs.aws.amazon.com/AWSEC2/latest/APIReference/OperationList-query-vpc.html
4. https://aws.amazon.com/cloudfront/?nc=sn&loc=0

Activity Based Learning (Suggested Activities in Class)

1. Demonstration EC2 instances using AWS cloud platform.
2. Creation of AWS S3 storage and Virtual Private cloud.
3. Creation of Amazon RDS, Amazon Redshift and Amazon DynamoDB.
4. Demonstration of Cloud watch and IAM.
5. Demonstration of Amazon Route 53, Amazon CloudFront .

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