20CS005 CLOUD COMPUTING

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P
45	-	30

WA/RA	SSH/HSH	CS	SA	S	BS
15	30	-	5	5	-

Course Description and Objectives:

This course gives an introduction to cloud computing and its techniques, issues, and its' services that will lead to design and development of a simple cloud service.

Course Outcomes:

Students are able to

Upon Completion of the course, the students will be able to

✓ Compare the strengths and limitations of cloud computing

✓ Identify the architecture, infrastructure and delivery models of cloud computing

✓ Apply suitable virtualization concept.

✓ Choose the appropriate Programming Models and approach.

✓ Address the core issues of cloud computing such as security, privacy and interoperability

✓ Design Cloud Services

SKILLS:

✓ Gain broad perceptive of cloud architecture and models

✓ Understand the concept of Virtualization and implements it.

✓ Understand the features of cloud simulator and simulate cloud environment

✓ Apply different cloud programming models.

✓ Learn and Design the trusted cloud computing system.

UNIT- I

INTRODUCTION: Definition, Historical developments, Computing platforms and technologies. PRINCIPLES OF PARALLEL AND DISTRIBUTED COMPUTING: Parallel versus distributed computing, Elements of parallel computing, Elements of distributed computing, Technologies for distributed computing.

UNIT– II

VIRTUALIZATION: Introduction, Characteristics, Virtualization techniques, Virtualization and cloud computing, Pros. and cons. of virtualization, Technology examples.

CLOUD COMPUTING ARCHITECTURE: Introduction, Cloud reference model, Types of clouds, Economics of clouds, Open challenges.

UNIT- III

Cloud Resource Management and Scheduling: Policies and Mechanisms for Resource Management, Applications of Control Theory to Task Scheduling on a Cloud, Stability of a Two-Level Resource Allocation Architecture, Feedback Control Based on Dynamic Thresholds, Coordination of Specialized Autonomic Performance Managers, A Utility-Based Model for Cloud-Based Web Services, Resource Bundling: Combinatorial Auctions for Cloud Resources, Scheduling Algorithms for Computing Clouds, Fair Queuing, Start-Time Fair Queuing, Borrowed Virtual Time, Resource Management and Dynamic Application Scaling.

UNIT- IV

CLOUD PLATFORMS IN INDUSTRY: Amazon web Services, Google app engine, Microsoft Azure. CLOUD APPLICATIONS: Scientific applications in healthcare, biology, geo-science; Business applications in– CRM and ERP, productivity, social networking, media applications, multiplayer online gaming.

UNIT- V
Cloud Security: Cloud Security Risks, Security: The Top Concern for Cloud Users, Privacy and Privacy Impact Assessment, Trust, Operating System Security, Virtual Machine Security, Security of Virtualization, Security Risks Posed by Shared Images, Security Risks Posed by a Management OS, A Trusted Virtual Machine Monitor

ADVANCED TOPICS IN CLOUD COMPUTING: Energy efficiency in clouds, Market based management of clouds.

LIST OF EXPERIMENTS

LIST OF EXPERIMENTS   **TOTAL HOURS: 30**

1.   Launch Amazon Linux EC2 Instance and connect windows client to it.

2.   Launch Windows EC2 instance in AWS and connect windows client to it..

3.   Configure Web Server on Amazon Linux instance with Elastic IP.

4.   Manage Elastic Block Storage(EBS).

5.   Configure Amazon Simple Storage Service (Amazon s3).

6.   Configure Amazon S3 Glacier.

7.   Configure Amazon EFS.

8.   Configure Amazon Virtual Private Cloud (VPC).

   a) Create your own VPC.

   b) Create public subnet.

   c) Create private subnet.

   d) Create a Internet gateway and attach to your VPC.

   e) Create Pubic Routing Table, associate subnet and add routing rules.

   f) Create Private Routing Table, associate subnet and add routing Rules.

g) To launch Windows instance in Public subnet.

9. Configure Amazon Elastic Load Balancer.

10. Configure Relational Database Service(RDS).

TEXT BOOKS:

1. Raj Kumar Buyya, C Vecchiola and S TSelvi , "Mastering Cloud Computing", 1st edition, Tata McGraw Hill Education (India), 2013.

2. Dan Marinescu ,Cloud Computing: Theory and Practice, 2nd Edition, Elsevier, 2017

REFERENCE BOOKS :

1. RajKumarBuyya, Broberg J and GoscinskiA, "Cloud Computing - Principles and Paradigms", 1st edition, Wiley, 2011.

2. Rittinghouse J W, and Ransome J F, "Cloud Computing - Implementation, Management, and Security", 1st edition, CRC Press, 2009.

3. Michael Wittig and Andreas Wittig, "Amazon Web Services in Action", 2nd edition, Manning Publications, 2015.