16IT350 CLOUD COMPUTING

Course Description and Objective:

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:

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.

Activities:

- Identify various network devices in laboratory.
- Investigate various network topologies.
- Connect various workstations in Ethernet.
- Simulate the data link protocols.
- Design of detecting and correcting errors in data transmission.
- Identify the different classes of IP addresses.
- Study on functionalities of routers.
- Simulate routing algorithms.

UNIT 1

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 2

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 3

ANEKA: Cloud Application Platform: Framework Overview, Anatomy of the Aneka Container, Building Aneka Clouds, Cloud Programming and Management.

HIGH THROUGHPUT COMPUTING- TASK PROGRAMMING: Task Computing, Task-Based application models, Aneka Task-Based programming.

UNIT 4

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

ADVANCED TOPICS IN CLOUD COMPUTING: Energy Efficiency in Clouds, Market Based Management of Clouds, Federated Clouds / Inter Cloud, Third Party Cloud Services.

Prescribed Text Books:

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

REFERENCEBOOKS:

1. RajKumar Buyya, 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.

LABORATORY EXPERIMENTS

1. To Launch Amazon Linux EC2 Instance
    1.1 To connect to Amazon Linux instance from Windows client operating system
2. To Launch Windows EC2 instance in AWS
    2.1 To connect Windows instance from Windows client operating system
3. To configure Web Server on Amazon Linux instance with Elastic IP
4. To Assign Elastic IP address
5. To Manage Elastic Block Storage(EBS)
6. To Configure Amazon Simple Storage Service (Amazon s3)
7. To configure Amazon S3 Glacier
8. To Configure Amazon EFS
9. To Configure Amazon Virtual Private Cloud (VPC)
    9.1. To Create your own VPC
    9.2. To Create public subnet
    9.3. To Create private subnet
    9.4. Create a Internet gateway and attach to your VPC
    9.5. Create Pubic Routing Table, associate subnet and add routing rules
    9.6. Create Private Routing Table, associate subnet and add routing Rules
    9.7. To launch Windows instance in Public subnet
10. To configure Amazon Elastic Load Balancer
11. To configure Relational Database Service (RDS)