

17CS005 CLOUD COMPUTING

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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 perceptives 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 I

Cloud History and Fundamentals: Cloud computing at a Glance, Historical Developments, Building cloud computing environments, Computing platforms and technologies, Cloud architecture, types of clouds, Economics of the cloud.

UNIT II

Virtualization: Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

UNIT III

Cloud Services and File System: Types of Cloud services: Software as a Service - Platform as a Service –Infrastructure as a Service - Database as a Service - Monitoring as a Service –

Communication as services. Service providers: Google App Engine, Amazon EC2, Microsoft Azure, Sales force. Introduction to Map Reduce, GFS, HDFS, Hadoop Framework.

UNIT IV

Programming Model: Parallel and Distributed Programming Paradigms – Map Reduce, Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments - Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

UNIT V

Security in the Cloud: Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Text Books:

1. Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, Mastering Cloud Computing, McGraw Hill Education, 2013
2. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, “Distributed and Cloud Computing, From Parallel Processing to the Internet of Things”, Morgan Kaufmann Publishers, 2012.
3. John W.Rittinghouse and James F.Ransome, “Cloud Computing: Implementation, Management, and Security”, CRC Press, 2010.
4. John Rittinghouse& James Ransome, “Cloud Computing Implementation Management and Strategy”, CRC Press, 2010.(UNIT-III)
5. Toby Velte, Anthony Velte, Robert Elsenpeter, “Cloud Computing, A Practical Approach”, TMH, 2009.