MCA 405: Cloud Computing and Virtualization	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	**Examination Scheme** Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Operating Systems, Computer Networking.

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Course Objectives:

1. To describe grid and cloud computing as an emerging technologies.
2. To understand the importance of grid and cloud computing along with various security issues.
3. To identify the differences between various types of computing techniques, Cloud deployment models and service models.
4. To understand the implementation of cloud security and mobile cloud computing concepts..
5. To analyze various virtualization and scheduling techniques.
6. To study the design approaches used by various cloud service providers.

Detailed Syllabus

Unit-1 **Recent trends in computing**: Introduction to Grid Computing: Motivation, Definition of Grid Computing, Evolution of Grid, Examples and Usages, Research Possibilities, Benefits of Grid Computing, Cluster Computing, Grid Computing, Utility Computing, Cloud Computing. Introduction to Grid Computing
Unit-2 **Cloud Computing Fundamentals**: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , Applications cloud computing, Business models around Cloud – Major Players in Cloud Computing - Issues in Cloud - Eucalyptus - Nimbus - Open Nebula, CloudSim.
Unit-3 **Cloud Computing Service Models:** Infrastructure as a Service; Platform as a Service; Software as a Service. **Accessing the Cloud:** Web Applications, Web API's, and Web Browsers.
Unit-4 **Cloud Storage and Security:** Overview, Advantages, Storage as a Service, Security, Reliability, Advantages, Cautions, Theft, Cloud Storage Providers. **Standards:** Applications, Client, Infrastructure, Services.
Unit-5 **Virtualization Technologies:** 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. Introduction to MapReduce, GFS, HDFS, Hadoop Framework.
UNIT-6 **Security in the Cloud:** Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

Course Outcomes:

Students will able to:

1. Define Cloud Computing and memorize the different Cloud service and deployment models.
2. Describe importance of virtualization along with their technologies.
3. Use and Examine different cloud computing services.
4. Analyze the components of open stack & Google Cloud platform and understand Mobile Cloud Computing.

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