

MCA 505 Grid and Cloud Computing

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:- MCA 204 Operating Systems, MCA 303 Data Communication & Computer Network.

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 I

Recent trends in computing: Cluster Computing, Grid Computing, Utility Computing, Cloud Computing. Introduction to Grid Computing: Motivation, Definition of Grid Computing, Evolution of Grid, Scope in Grid Computing, Benefits of Grid Computing.

UNIT II

Grid Basics: Grid Architecture and its relationship to other distributed technologies, Grid Application Areas. Security Issues in Grids: Authentication Issues Trust and Privacy related Issues, Authorization Issues, Grid Security Framework, and GSI.

UNIT III

Basics Cloud Computing Overview, Characteristics; Applications; Benefits; Limitations; Challenges; Cloud Computing Service Models: Infrastructure as a Service; Platform as a Service; Software as a Service; Cloud Computing Deployment Models: Private Cloud; Public Cloud; Community Cloud; Hybrid Cloud, Major Cloud Service providers

UNIT IV

Cloud Storage and Security: Overview, Advantages, Storage as a Service, Security, Reliability, Advantages, Cloud Storage Providers. Accessing the Cloud: Web Applications and Web API's. Standards: Applications, Client, Infrastructure, Services.

UNIT V

Virtualization Technologies: Types of Virtualization, Benefits of Virtualization, Hypervisors. Scheduling in Cloud Overview of Scheduling problem, Different types of scheduling, Introduction to Mobile Cloud Computing.

UNIT VI

Developing Applications: Programming Paradigms – MapReduce, Hadoop Library from Apache, Cloud Computing Platform and Tool, Google App Engine, Amazon AWS. Cloud Software Environments - Eucalyptus, Open Nebula, OpenStack, Aneka.

Text and Reference Books

- 1- The Grid- Blueprint for a New Computing Infrastructure, Ian Foster, Carl Kesselman, 2nd Edition, Morgan Kaufmann Publications,2003.
- 2- Grid Computing: Making the Global Infrastructure a Reality, Francine Berman, Geoffrey Fox, Tony Hey, John Wiley & Sons,2003.
- 3- Cloud Computing: Principles and Paradigms, RajkumarBuyya and James Broberg, John Wiley & Sons, 2011.
- 4- Cloud Computing, A Practical Approach, Anthony T Velte, McGraw Hill, 2010.

Course Outcomes:

After completing the course, students will be 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.
5. Describe the key components of Amazon web Service.
6. Design & develop backup strategies for cloud data based on features.