

<b>CSE21921</b>	<b>Cloud Storage (Elective -II)</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Version 1.0</b>	<b>Contact Hours -45</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>Pre-requisites/Exposure</b>	<b>DBMS, Java, Python, Computer Networking</b>				
<b>Co-requisites</b>	<b>--</b>				

### Course Objectives:

- To introduce cloud computing-based programming techniques and cloud services.
- To introduce concepts and security issues of cloud paradigm.
- To impart the fundamentals of virtualization techniques.

### Course Outcomes:

On completion of this course, the students will be able to

CO1. **Explain** the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.

CO2. **Identify** the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc..

CO3. **Explain** the core issues of cloud computing such as security, privacy, and interoperability CO4. **Determine** flexible and scalable infrastructure suitable to the organizational need.

CO4. **Identify** problems, and explain, analyze, and evaluate various cloud computing solutions. CO5. **Explain** the appropriate cloud computing solutions and recommendations according to the applications used.

### Catalog Description:

This course provides a post graduate-level comprehensive introduction to cloud computing with an emphasis on advanced topics. The objective of this course is to provide graduate students of MCA with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations. Another objective is to expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research. The goal of the final paper is to present a new idea or innovation using cloud computing.

### Course Content:

#### Unit I:

**8 lecture hours**

**Virtualized data center architecture:** Cloud infrastructures; public, private, Hybrid Cloud, Service provider interfaces; SaaS, PaaS, IaaS, VDC environments; concept, planning and design, Business continuity principles, Disaster recovery principles, Managing VDC, Managing cloud environments and infrastructures.

**Information storage security & design:** Storage strategy and governance; Security and regulations, Designing secure solutions; The considerations and implementations involved, Securing storage in virtualized environments., Securing storage in cloud environments, Monitoring and management; Security auditing and SIEM.

**Unit III: 6 lecture hours**

**Information availability design:** Designing backup/recovery solutions to guarantee data availability in a virtualized environment, Design a replication solution, local remote and advanced, Investigate Replication in NAS and SAN environments, Data archiving solutions; analyzing compliance and archiving design considerations.

**Unit IV: 10 lecture hours**

**Storage network design:** Architecture of storage, analysis, Planning, Storage network design considerations; NAS and FC sans, Hybrid storage networking technologies (iscsi, FCIP, fcoe), Design for storage virtualization in cloud computing, Host system design considerations.

**Unit V: 11 lecture hours**

**Optimization of cloud storage:** Global storage management locations, Scalability, Operational efficiency. Global storage distribution; terabytes to petabytes and greater, Policy based information management; metadata attitudes; file systems or object storage.

**Text Books:**

1. Greg Schulz, “Cloud and Virtual Data Storage Networking”, Auerbach Publications [ISBN: 978-1439851739], 2011.
2. Marty Poniatowski, “Foundations of Green IT” Prentice Hall; 1 edition [ISBN: 978- 0137043750], 2009.

**Reference Books:**

1. Mastering Cloud Computing by Rajkumar Buyya, C. Vecchiola & S. Thamarai Selvi McGRAW Hill Publication
2. Miller Michael, “Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education India
3. Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata McGrawHill