

Branch Name:	Information and Communication Technology
Semester/Year:	Semester VII/ Fourth Year
Subject Title:	Cloud Computing (Elective-II)
Subject Code:	1ET1070705
Pre-requisite:	Fundamentals of Distributed Computing

Course Objective:

1. To understand the principles and paradigm of Cloud Computing
2. To understand the Service Model with reference to Cloud Computing
3. To appreciate the role of Virtualization Technologies
4. Ability to design and deploy Cloud Infrastructure
5. Understand cloud security issues and solutions

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	
03	-	-	03	70	30	100

Content:

Sr. No.	Topic	Total Hrs.	Weightage %
1	Introduction to Cloud Computing: Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks	6	20
2	Cloud Architecture, Services and Applications: Exploring the Cloud Computing Stack, Connecting to the Cloud, Infrastructure as a Service, Platform as a Service, SaaS Vs. PaaS, Using PaaS Application Frameworks, Software as a Service Cloud Deployment Models, Public vs Private Cloud, Cloud Solutions, Cloud ecosystem, Service management, Computing on demand, Identity as a Service, Compliance as a Service	8	25
3	Abstraction and Virtualization: Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context, Virtualization of CPU, Memory, I/O Devices, Virtual Clusters and Resource management, Virtualization for Data Center Automation	10	25

4	Cloud Infrastructure and Cloud Resource Management: Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture Development, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources. Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards	8	15
5	Cloud Security: Security Overview, Cloud Security Challenges and Risks, Software-as-a Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Autonomic Security Establishing Trusted Cloud computing, Secure Execution Environments and Communications, , Identity Management and Access control Identity management, Access control, Autonomic Security Storage Area Networks, Disaster Recovery in Clouds	10	15

Course Outcome:

After learning the course the students should be able to:

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computing
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player , Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability
6. Design Cloud Services and Set a private cloud

Text Book:

1. Cloud Computing: Concepts, Technology & Architecture, Ricardo Puttini, Thomas Erl, and Zaigham Mahmood.

List of Reference Books:

1. Rajkumar Buyya et. el., Cloud Computing: Principles and Paradigms, Wiley India Edition
2. Sosinsky B., “Cloud Computing Bible”, Wiley India
3. Mastering Cloud Computing by Rajkumar Buyya, C. Vecchiola & S. Thamarai SelviMcGRAW Hill Publication
4. Miller Michael, “Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education India
5. Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata McGrawHill

e-Resources (If any):

2. CloudSim 3.0.3
3. <http://www.cloudbus.org/>