

Branch Name:	Information and Communication Technology
Semester/Year:	Semester I / First Year
Subject Title:	Cloud Computing
Subject Code:	2ET2080104T
Pre-requisite:	Fundamental of Distributed Computing

Course Objective:

The main objective of this course is: To make the students familiar with the fundamentals and essentials components of Cloud Computing. The course aims to make the students use and adopt Cloud services and tools in their real life scenarios. The course intends to enable students exploring GoogleApps, Microsoft Azure and Amazon Web Services and other businesses cloud applications.

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								Total (Marks)
					Theory (Marks)				Practical (Marks)				
	L	T	P	Total	SEE		CCE		SEE		CCE		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
3	3	-	-	3	24	60	16	40	-	-	-	-	100

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	INTRODUCTION TO CLOUD COMPUTING: NIST definition, Service/Deployment Models, Architecture, Features, Advantage/Disadvantage	2	10
2	CLOUD AS A SERVICE: Infrastructure as a Service, Platform as a Service, Software as a Service, Identity as a Service, Security as a Service, Compliance as a Service.	2	10

3	RESOURCE MANAGEMENT: Virtualization, Hypervisors, Load balancing, Server Consolidations, VM Migration	4	18
4	SLA MANAGEMENT: Introduction, Traditional Approaches, Types & Life Cycle of SLA, SLA Management in Cloud	4	18
5	WORKFLOW ENGINE FOR CLOUDS: Introduction, Workflow Management Systems and Clouds, Architecture of Workflow Management Systems	3	12
6	CLOUD SECURITY: Cloud Security Overview, Issues / Challenges, Data security, Identity & Access Management, Distributed intrusion and anomaly detection.	3	12
7	LEGAL ISSUES IN CLOUD COMPUTING: Data Privacy and Security Issues, Jurisdictional Issues, Commercial and Business Considerations	2	10
8	Reviewing case studies (E.g. AWS, Eucalyptus) and understanding simulations tools (E.g. Cloudsim)	4	10

Review Presentation: The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to refer at least two peer reviewed journal papers related to this domain/subject. The student is expected to identify issues/challenges and emerging trends in the domain/subject. Student is supposed to explore various video lectures (E.g. NPTEL) available in the domain/subject. Student is required to make a review-presentation on the work carried out for the same.

Recommended sites for journal papers are (1) dl.acm.org (2) springer.com (3) sciencedirect.com (4) elsevier.com (5) ieeexplore.ieee.org (6) scholar.google.co.in (7) scopus.com or similar of similar repute.

Course Outcome:

Upon successful completion of this course the student would be able to:

- To explain and characterize different cloud computing models.
- To identify security concerns in cloud computing.
- To analyze the trade-offs inherent in Cloud Computing.
- To identify appropriate design choices when solving real-world cloud computing problems.
- To make recommendations on cloud computing solutions for an enterprise

List of References:

1. Barrie Sosinsky, "Cloud Computing Bible", Wiley-India, 2010
2. RajkumarBuyya, James Broberg, Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms", Wile, 2011
3. Nikos Antonopoulos, Lee Gillam , "Cloud Computing: Principles, Systems and Applications", Springer, 2012

4. Ronald L. Krutz, Russell Dean Vines , “Cloud Security: A Comprehensive Guide to Secure Cloud Computing”, Wiley-India, 2010
5. Velte T., Velte A., Elsenpeter R, “Cloud Computing – A practical Approach”, Tata McGrawHill
6. L. Wang, R. Ranjan, J. Chen, and B. Benatallah, Cloud Computing: Methodology, Systems, and Applications, CRC Press, Boca Raton, FL, USA, ISBN: 9781439856413, October 2011.
7. Kai Hwang, Geoffrey Fox, and Jack Dongarra, "Chapter 7, Cloud Architecture and Datacenter Design" in Distributed Computing: Clusters, Grids and Clouds, May 2010

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom’s Taxonomy Level
CLO1	Compare the strengths and limitations of cloud computing	3 Applying, 2 Understanding
CLO2	Identify the architecture, infrastructure and delivery models of cloud computing	3 Applying, 2 Understanding
CLO3	Apply suitable virtualization concept.	5 Evaluate, 4 Analyze
CLO4	Choose the appropriate cloud player, Programming Models and approach.	3 Applying, 2 Understanding
CLO5	Address the core issues of cloud computing such as security, privacy and interoperability	1 Remembering
CLO6	Design Cloud Services and Set up a private cloud.	6 Creating

Mapping of CLOs with Pos& PSOs

Course Learning Outcomes	Program Out comes(POs)												Program Specific Outcomes(PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO1	M				M								H			
CLO2	M	L	M	H					M		L		L	M		
CLO3	M	M		M									L	M		
CLO4	M	L		L				H	L		L					

CLO5	M		M	M	L									M		
CLO6	H	M									L		L			

H:High, M:Medium, L:Low