GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Name: Cloud Services & Security(Elective)
Subject Code: 3735502
Semester III

Type of course: ME - Computer Engineering (HIGH PERFORMANCE COMPUTING [HPC])

Prerequisite:

1. Operating System
2. Networking
3. Computer Architecture
4. Cloud Computing

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	PA (V) ESE	PA (I)	
3	2#	0	4	70	30	30	20	150

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment;

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Cloud Computing Fundamental: Cloud computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud, Security Concepts: Confidentiality, privacy, integrity, authentication, non-repudiation,	6	15
2	Availability, access control, defense in depth, least privilege, how these concepts apply in the cloud, what these concepts mean and their importance in PaaS, IaaS and SaaS e.g. User authentication in the cloud, Virtual Private Cloud(VPC),cloud services and virtualization Standards, compliance for the cloud provider vs. compliance for the customer.	6	15
3	Isolation of users/VMs from each other ; Virtualization System Security Issues ,Virtualization System Vulnerabilities, Management console vulnerabilities, management server vulnerabilities, administrative VM vulnerabilities, guest VM vulnerabilities, hypervisor vulnerabilities, hypervisor escape vulnerabilities, configuration issues, malware.	7	20
4	Virtualization System-Specific Attacks: Guest hopping, attacks on the VM (delete the VM, attack on the control of the VM, code or file injection into the virtualized file structure), VM migration attack, hyperjacking	7	20

Reference Books:

1. Cloud Computing: Principles and Paradigms, Editors: Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wile, 2011
2. Ronald L. Krutz, Russell Dean Vines, Cloud Security

Course Outcome:

After learning the course the students should be able to:

1. Understanding the key dimension of the Challenges of Cloud computing
2. Applying relevant methodologies to assess the privacy, compliance and legal challenges organizations face in deploying cloud computing solution to support their mission and Processes
3. Applying relevant methods to assess the important security and sustainability challenges involved in adopting various cloud architectures and making informed decisions for the organization \
4. Applying relevant Comparative methodologies to assess the technological and economic comparative advantages of various cloud computing Architecture
5. Effectively participate in the informed process of selecting the cloud Computing Solution most appropriate for mobile Platform
6. Provide security in the Cloud Services.

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website