GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Name: Infrastructure Management & Virtualization
Subject Code: 3735501
Semester III

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

Prerequisite:

1. Cloud Computing
2. Resource management for scalable system

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	PA (V) ESE	PA (I)	
3	0	2#	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	Servers, desktop, network Virtualization, The evolution of computing infrastructures and architectures from standalone servers to rack optimized blade servers and Data centers, HVAC, Basic requirements for driving Data Centers, environmental & physical challenges in driving Data Centers	6	15
2	Provision, monitoring and management of multiple enterprise-level virtual servers and virtual machines through software management interface, LXC, Docker, Vagrant, kvm, xen Hyper v, Bare-metal Introduction, Bootstrapping Chef/puppet, Chef/puppet recipes Centralized logging: nagios Statsd Graphite ,bottlenecks Auto-scaling, Auto-rebuilding old instances Updating without downtime Auto-healing, Devops, Deployment & migration, CI, Monitoring		
3	Performance Management in a Virtual Environment: Management techniques, methodology and key performance metrics used to identifying CPU, memory, network, virtual machine and application performance bottlenecks in a virtualized environment	6	15
4	Backup and recovery of virtual machines using data recovery techniques; Scalability: Scalability features within Enterprise virtualized environments using advanced management applications that enable clustering, distributed network switches for clustering, network and storage expansion; High Availability : Virtualization high availability and redundancy techniques, Software Defined network	7	20
5	Introduction to hibernate, HQL, J2EE (struts) and hibernate, Introduction to Spring Framework	7	20

Reference Books:

1. Administering Data Centers: Servers, Storage and Voice over IP by Kailash Jayaswal
2. IT Virtualization Best Practices: A Lean, Green Virtualized Data Center Approach, MC Press

Course Outcome:

After learning the course the students should be able to:

1. Describes the Server management
2. Design how the virtual machines are working in the Cloud environment
3. Demonstrate the Scalable Assessment of infrastructure management
4. Describes how the performance analysis is done
5. Study on back-up and recovery planning is done in virtual environment

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