

GUJARAT TECHNOLOGICAL UNIVERSITY

COMPUTER ENGINEERING (SYSTEMS & NETWORK SECURITY)(56)

DATA CENTER MANAGEMENT

SUBJECT CODE: 2745601

M.E. 4TH SEMESTER

Type of course: Major Elective - V

Prerequisite: Basic networking concept, Basic network security concept

Rationale:

Data Centers are complex system that includes wide varieties of technologies that are constantly evolving. Thus designing and maintaining a data center requires skills and knowledge of servers and applications. This course will help student to learn how to build reliable and secure designs and data center policies that can withstand human fallacies and technical breakdowns.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
				ESE (E)	PA (M)	ESE (V)		PA (I)		
		ESE	OEP			PA	RP			
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	An overview of data center: Data Center Defined, Goals, Facilities, Role of Data Centers in Enterprise and in service provider environment, Application architecture Model, Client server model, n tier model, multitier architecture application environment.	4	10
2	Data Center Architecture: Data Center Requirements, Data center Prerequisites, Budget construction, Selection of geographical location, Selection of building, Architecture Aggregation layer, Access layer, Storage Layer, Data Center Transport Layer, Data Center Services , IP Infrastructure Service, Application Service, Security Services, Storage services, business continuance Infrastructure Services.	4	15
3	Data Center Design overview: Characteristics of an outstanding design, Guidelines for planning Data Center, Data Center Structure, Raised Floor Design and Deployment. Design and Plan against Vandalism, Types of Server Farm and Data center, Internet Server farm, Intranet Server Farm, Extranet Server Farm, Corporate Data Center, Data center Topology.	4	15
4	Data Center security overview: The need for Data Center Security ,Vulnerabilities and common attacks ,Threats, Vulnerabilities, common attack, Network security Infrastructure - ACLs, Firewalls, IDs, Security Fundamental , Cryptography, Virtual private network. Data center security Frame work, Security policies, Life	4	10

	cycle, and secure management framework.		
5	Load-balancing : Load balancing terminology, Advantages of load balancing, Types of load balancing, Implementing network with load balancing switches.	4	10
6	Network Infrastructure in a data center Modular Cabling Design, Points of Distribution, ISP Network Infrastructure, ISP WAN Links	2	5
7	Data Center Maintenance: Network Operations Center, Network Monitoring, Data Center physical security, Data Center Logical security.	3	10
8	Server Administration: Best Practices for System Administration, System Administration Work Automation.	2	5
9	Device Naming : Naming Practices, NIS, DNS, LDAP	2	5
10	Data center Consolidation: Reasons for data center Consolidation, Consolidation opportunity, Server consolidation, Storage Consolidation, Network Consolidation, Service Consolidation, Process Consolidation, Staff Consolidation, Data Consolidation phases	3	7
11	Case Study: 1. IBM Data Center Technology 2. Google Data Center. 3. Blade Server in Data Center.	4	8

Reference Books:

1. Administering Data Centers: Servers, Storage and Voice over IP, Kailash Jayaswal.
2. Data center fundamentals Mauricio Arregoces, Maurizio Portolani.
3. Data Center Blade Server Integration Guide

Course Outcome:

After learning the course the students should be able:

1. Understand the working & management of Data Center

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.