

GUJARAT TECHNOLOGICAL UNIVERSITY

INFORMATION TECHNOLOGY (23)

IT INFRASTRUCTURE MANAGEMENT

SUBJECT CODE: 2722315

SEMESTER: II

Type of course: Elective

Prerequisite: Computer Network, Network Security essentials, Knowledge of Network Operating System

Rationale: Today Networks and IT infrastructure components are the nerves, which enable the information flow both within and outside the organizations. Progressive enterprises have always faced challenges while managing and designing IT infrastructure, which will meet the business needs. Emerging technologies such as unified communications, enterprise wide networks, and next generation intelligent network solutions are expected to be used in unison to meet the growing needs of organizations. There is certain need of professionals who will act as a catalyst in the planning, design, deployment and monitoring of such complex and large networks. This unique role demands a sound understanding of the business and technological domains.

Teaching and Examination Scheme:

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

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	IT infrastructure Introduction, challenges, design issues in IT organization and IT infrastructure, Determining customer's requirements, IT systems, management process, IT service management process, Information system design process, patterns for IT systems management, IT infrastructure library	2	5
2	Service delivery process Service level management, financial management, IT service continuity management, capacity management, availability management	2	5
3	Service support process Configuration management, incident management, problem management, change management, release management	2	5
Introduction - Networking			
4	Protocols : OSI Model, TCP/IP model, Different Protocols, Network Address Translation (NAT), WAN Protocols, Wireless Protocols	4	10
5	IP Subnetting and Variable Length Subnet Masks: Subnetting basics, Classless inter domain routing (CIDR), Subnetting classes, VLSM, VLSM design	4	10

6	Internetwork: Cisco IOS, Router Booting sequence, Configuration Registers, IP Routing – static and dynamic, RIP, IGRP, EIGRP, Layer 2 switching, VLAN	3	10
Network Security			
7	Network Security: Firewall voice traversal, ICMP inspection, Access lists – Extended, advanced, named, Monitoring Access lists, Wild card – masking	3	10
8	Security Management: Computer and Internet Security, Physical Security, Identity Management, Access Management, Intrusion Detection, Security Information Management	2	5
9	IT Ethics: Cyber Ethics, Intellectual Property, Privacy and Law, Computer Forensics, Ethics and Internet, Cyber Crimes	2	10
Server Configuration Management			
10	Linux: Shell scripting for managing hardware devices and networking, X-Windows, Linux commands advanced, IP Address Configuration for Linux, Boxes, SAMBA, Linux kernel – Module installation, Creating & managing user accounts, Creating & managing group accounts, Configuration of User system policies, Configuration of Group system policies	4	10
Data Centre Infrastructure Management			
11	Data Center Infrastructure: Data Center Infrastructure Architecture Overview - Data Center –site location and site configuration, Various Elements in a Data centre-their functions, Hardware and Software Recommendations, Software Recommendations, Data Center Multi-Layer Design, Network Management Data Center Infrastructure Design - Data Center Design Models Routing Between the Data Center and the Core, Switching Architecture for the Server Farm Data Center Infrastructure Configuration - Configuring Network Management, VLAN Configuration, Spanning Tree Configuration, Switch-To-Switch Connections Configuration, Server Port Configuration, Promise of UC	6	10
12	Back-up and recovery: Disaster Recovery, Alternate site	1	0
13	Data Center Security: Security aspects in a DataCentre, Packet Filtering: Aggregation Layer, Packet Filtering: Access Layer, Security for Multi-Tier Server Farms, Intrusion Detection Sensors	3	5
14	Virtual Data Centre: What is a Virtual data Centre, Virtual Data Centre management, Remote Management	2	5

Reference Books:

1. For networking and Network Security –

- CCNA Cisco Certified Network Associate Study Guide - Richard Deal
- CCNA Cisco Certified Network Associate - Todd Lammle

2. For Data Centre Infrastructure Management –

- Data Center Fundamentals” by Mauricio Arregoces, Maurizio Portolani, Cisco Press 2003. ISBN 1587050234
- http://www.commbits.com/html/premium_data_center.php
- http://www.cisco.com/en/US/netsol/ns340/ns394/ns224/ns304/networking_solutions_design_guidances_list.html
- <http://www.cisco.com/go/datacenter>
- <http://www.datanets.ro/datacenter.htm>

3. **It Infrastructure & Its Management, Phalguni Gupta**, Tata McGraw-Hill Education
4. IT Infrastructure and Management (For the GTU and MMTU) (Paperback) Author :Choubey M K
Publisher :PEARSON EDUCATION(SINGAPORE) PTE. LTD.-DELHI

Course Outcome:

After learning the course the students should be able to:

- 1) Understand data security to application level security
- 2) Understand installation, Configuration & Management of Linux OS and its other features.
- 3) Understand basic aspects of architecture, design and security of Data Center

List of Tutorials:

- 1) Design and find out KEY ISSUES for AIRPORT INFRASTRUCTURE . IT infrastructure needed for Improvement of air traffic control services, Improvement of ground facilities, Improvement of cargo handling facilities, Commercial activities, Airport security, Financing airport infrastructure, Environmental issues, Regulatory Mechanism, Legal Framework
- 2) Design and find out KEY ISSUES – RURAL INFRASTRUCTURE. Wired network, wireless network, Pricing of infrastructure services (recovery of capital and operating costs during the life time of the asset)
- 3) Design IT policy for an Enterprise.(Accessing the internet, E-mail)

Major Equipment:

- computer, internet connection and required , router, switch

List of Open Source Software/learning website:

NPTEL resources

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