

Annexure – A

COMPUTER NETWORK DESIGN					
Course Code	ET826		Credits	3	
Scheme of Instruction Hours/ Week	L	T	P	TOTAL	
	3	0	0	45 hrs/sem	
Scheme of Examination TOTAL = 125 marks	IA	TW	TM	P	O
	25	0	100	0	0

Course Objectives:

1. An introduction to key components of any data network.
2. An understanding of the hierarchical addressing of devices, IP addressing and how this allows communication between networks.
3. An understanding of the various layers and their interfaces in the TCP/IP model.
4. An ability to configure devices, apply address and VLANs in a network topology.
5. An introduction of Wireless LAN technology.

Course Outcomes:

After successful completion of the course student will be able to:

C01	Explain the impact of networking devices and its associated protocols in an enterprise network.
C02	Apply various addressing schemes including subnetting and VLSM to a network for catalyst switches and routers.
C03	Compare various services provided by each layer of TCP/IP protocol.
C04	Design networks as per requirements based on various protocols.

UNIT -1	
Internetworking basics: Types of networks, Line configuration, Modes of transmission, Topology; OSI reference model; Ethernet Cabling. Three Layer Hierarchical Model: Core layer, Distribution layer, Access layer. Networking devices: Hubs, Switches, Routers, Repeaters, and Bridges.	9 hrs
UNIT -2	
TCP/IP model: 4 layers protocols; IP addressing: class A, B, C, D, E, Private IP Addresses; IPV4 Address types: Unicast, broadcast, multicast; IP Subnetting: Subnet masks, Classless Inter-Domain Routing (CIDR), Subnetting Class C Addresses, Subnetting Class B Addresses, and Subnetting Class A Addresses. Variable Length Subnet Masks (VLSM): VLSM Design, Implementing VLSM Networks. IPv6: Benefits and Uses; Addressing; Working; IPv6 Routing Protocols: RIP, EIGRPv6, OSPFv3; Migrating to IPv6.	12 hrs

UNIT -3	
Router Fundamentals: Internal Components, Ports, Router Boot Sequence; Command-Line Interface (CLI): Overview of Router Modes; Router Administrative Configurations: Hostnames, Banners, Setting passwords, recovering passwords; Router Interfaces: Configuring an IP Address on an interface, Bringing up an interface, Serial Interface Commands; Viewing, Saving Erasing and Changing Configurations. IP Routing: Routing Basics; IP Routing Process; Configuring IP Routing: Static Routing: Manual, Default Routing; Dynamic Routing: Routing Protocols Basics, Distance-Vector Routing Protocols, Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF); Introduction to Access Control Lists (ACLs): Standard, Extended; Network Address Translation (NAT), HSRP, DHCP, Ether Channels.	12 hrs
UNIT -4	
Layer 2 Switching; Switching services; Types of switches; Spanning Tree Protocols (STP); Configuring Catalyst Switches: Basic Commands, Port security; Virtual LANs (VLANs): VLAN Basics, Routing between VLANs, Configuring VLANs; VLAN Trunking Protocol (VTP): Modes of operation, Configuring VTP. Wireless LAN: Basic Wireless Devices; Wireless Topologies: Independent Basic Service Set (Ad Hoc), Basic Service Set (BSS), Infrastructure Basic Service Set; Wireless Standards. Wireless Security.	12 hrs

TEXTBOOKS

1	Todd Lammle, CCNA Routing and Switching Study Guide, Wiley-India, Seventh Edition, 2011.
2	Wendell Odom, Cisco CCNA Routing And Switching ICND2 200-101, Official Cert Guide, Cisco Press,2013.

REFERENCES

1	James Macfarlane; Network Routing Basics: Understanding IP Routing in Cisco Systems, Wiley-India, Edition 2006.
2	James F Kurose, Keith W Ross, Computer Networking: A Top-down Approach Pearson Sixth Edition, 2005.
3	Andrew S Tenenbaum, Computer Networks, Pearson , Fourth Edition.2003.
4	Prakash C Gupta, Data Communications and Computer Networks, PHI Learning Private Ltd,2nd Edition,2014.
5	Behrouz A. Forouzan, Data Communication & Networking, Tata Mc-Graw Hill, 2nd edition,2007.