16MA306	COMPUTER COMMUNICATION AND NETWORKS	3/0/0/3

Course Pre-requisites: Basics of Internet

Course Objectives:

1. To introduce computer networks and concentrate on building a firm foundation for understanding the overview of Data Communications and Computer Networks.
2. To make the students understand state-of-the-art in network protocols and standards, architectures, and applications in different layers
3. To understand the network models that serves to organize, unify, and control the hardware and software components of data communications and networking.

Course Outcomes:
Upon completion of the course, students shall have ability to

1. Understand the basic taxonomy of data communications and computer networks.
2. To understand and apply a wide range of error correction, routing, addressing, and network security algorithms.
3. Identify the different types of network devices and their functions within a network
4. Understand and building the skills of subnetting and routing mechanisms.
5. Familiarity with the state-of-art protocols of computer networks, and how they can be used to assist in network design and implementation.
6. Ability to simulate and implement some of the existing networking protocols and also the ability to design and develop new protocols.

Course Contents

UNIT NO.	DESCRIPTION	TEXT BOOK	PAGES	LECTURE HOURS
I	Introduction: Networks – Protocols and standards – Standards organizations – Line configurations	T1	3-21	2
	Topology – Transmission mode – Categories of networks – Inter networks.	T1	76-96	2
	OSI model: Functions of the layers.	T1	29-42	1
	Encoding and modulating: Digital-to-digital conversion – Analog-to-digital conversion – Digital-to-analog conversion –Analog-to-analog conversion.	T1	101-131, 141-156	4
	Transmission media: Guided media – Unguided media – Transmission impairment – Performance.	T1	191-208	1
II	Error detection and correction: Types of errors – Detection – Vertical Redundancy Check (VRC) – Longitudinal Redundancy Check (LRC) – Cyclic Redundancy Check (CRC) –Check sum - Error correction.	T1	267-299	4
	Data link control: Line discipline – Flow control – Error control.	T1	307-339	4
	HDLC, Project 802 – Ethernet – Token ring – FDDI- Bridges.	T1	340-343,395-454	4
III	Switching: Circuit switching–Packet switching – Message switching.	T2	214-221	2
	Internetworks- IP addressing methods – Subnetting	T2	549-572	2
	Networking and internetworking devices: Repeaters – Bridges – Gateways – Other devices	T2	445-455	2
	Routing algorithms – Distance vector routing – Link state routing.		658-678	2

	Duties of transport layer – Multiplexing – Demultiplexing – Sockets	T2	703-708	1
	User Datagram Protocol (UDP) – Transmission Control Protocol (TCP)	T2	709-735	2
IV	Congestion Control	T2	765-773	2
	Quality of services (QOS) – Integrated Services.	T2	775-784	2
	Domain Name Space (DNS) – SMTP	T2	798-812,	2
V	FTP – HTTP – WWW-SNMP	T2	840-845,861-870,877-897	3
	Network Security.	T2	961-990	3
			Total instructional hours:45	

TEXT BOOKS:

T1. BehrouzA.Forouzan, 'Data Communication and Networking', Fourth, Tata McGraw
    Hill, 2007.

REFERENCE BOOKS:

1. Andrew Tannenbaum.S. 'Computer Networks', Pearson Education, 4th Edition, 2011.
2. William Stallings, 'Data and Computer Communication', 8th Edition, Pearson Education, 2007.

WEB REFERENCES:

1. http://http://nptel.ac.in/courses/106105082/