

Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Electronics and Instrumentation)			
Subject Code & Name	Instructions Hours per Week			Credits			
5EIRG3 COMPUTER NETWORKS	L	T	P	L	T	P	Total
		3	1	0	3	1	0
Duration of Theory Paper: 3 Hours							

Course Objective:

The course is designed

1. To understand the basics of Data Communication.
2. To understand the principles of computer networking, including protocol design, protocol layering, algorithm design, and performance evaluation.
3. To study and understand TCP/IP Protocol suite designed for the application layer, transport layer, network layer, Data link layer and Physical Layer.
4. To implement various Algorithms of TCP/IP suite and analyse their performance.

Prerequisite(s): Fundamental knowledge of data transmission

COURSE CONTENTS

Unit I

Computer network – Hardware, Software, Reference model, physical layer

Network and application, categories of network-LAN, MAN, WAN, Wireless Network, Internetwork, Reference models.– OSI,TCP/IP model and their comparison, Line configuration-point to point, multicast ,broadcast ,Network Topology – Mesh , Star ,Tree , Bus , Ring , Hybrid

Physical Layer – Shannon’s maximum data rate of a channel, Transmission media – Guided as Magnetic, Twisted Pair, coaxial cable, fiber optics etc., wireless as radio wave, microwave, infrared

Unit II

Data Link Layer

Framing techniques , Error detection-correction , Multiplexing-TDM ,FDM,WDM ; switching – circuit , message , packet switching , Repeaters, Hubs , Bridges ,switches ,routers and gateways ;Data link protocols-- unrestricted simplex protocol, stop & wait , sliding window ,Go-back- n ,selective repeat, data link layer in internet

Unit III

Medium Access control sublayer

Channel allocation, Multiple access protocols – ALOHA, CSMA, CSMA /CD, collision-free protocol

Ethernet- frame format, cabling, encoding, performance, fast Ethernet, gigabit Ethernet, Broadband and wireless LAN, Bluetooth

Unit IV

Network layer

Connectionless – connection oriented service, comparison of virtual circuit and datagram subnet, Routing algorithms- shortest path , flooding ,distance vector , hierarchical routing , congestion control and prevention ,Quality of service , network layer in internet- IP protocol and IP address, IPv6, OSPF, BGP routing protocol.

Unit V

Transport layer and Application layer

Elements of transport protocol, internet transport protocol-UDP / TCP protocol, performance issues-Network performance measurement, system design for better performance
Domain name system, email, world wide web- architecture, HTTP

Course Outcome:

Students earned credits will develop ability to

CO.No.	CO	PO
CO1	To analyze the classification of network services, protocols and architectures.	PO-2,PO-3
CO2	To understand key Internet applications and their protocols.	PO-1,PO-8
CO3	To learn basic concepts of MAC protocols and demonstrates wireless LAN.	PO-2, PO-9
CO4	To design and analysis of the routing Protocols	PO-4,PO-7
CO5	Investigate various design issues in Application layer.	PO-1, PO-3, PO-5

CO-PO Relationship

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1		2	1									
CO2	1							3				
CO3	1								2			
CO4				1			2					
CO5	2		1		3							

BOOKS RECOMMENDED

- [1] Andrew S. Tannenbaum, Computer Networks, 4/E Pearson Education, 2003 ,
- [2] William Stallings ,Data and Computer Communications , 8/E Prentice Hall India, 2007