Course Outcomes (COs) with Mappings

After completion of this course students will be able to:

CO	CO Description	PO	Learning Domains	Knowledge Profile	Complex Engineering Problem Solving/ Engineering Activities
CO1	**Identify, use** and **justify** algorithms, protocols and phenomena of different computer network layers for analyzing and designing functional networks	PO2	C2, C3	K4	
CO2	**Analyze**, **develop** and **justify** networking algorithms and protocol for effective design of computer networks	PO3	C2, C3, C4, A2, A4, A5	K5	EP1, EP2, EP3, EP4
CO3	**Apply** appropriate tools to **build** and simulate computer networks and **analyze** packet transmission	PO5	C3, C6, P3	K6	
CO4	**Identify** and **use** appropriate computer network solutions; and construct a complete computer network for coping with the evolving and changing technologies	PO12	P3, P5 A4, A5		

Course Topics, Teaching-Learning Method, and Assessment Scheme

Course Topic	Teaching-Learning Method	CO	CO Marks				Exam (Mark)
			C2	C3	C6		
Introduction to computer networks, layers, transmission media. Data link layer: introduction, design issues, framing.	Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant	CO1, CO2				30	Midterm (30%)
Protocol verification: finite state machine & petri net models							
MAC, Channel allocation problem, CSMA/CD, Contention period, BEB, CSMA							
Collision-free protocols: bit-map, binary countdown, limited contention							
Internet Protocol (IP), IPv4 header, NAT IP addresses and subnets							

Static and dynamic routing algorithm, Distance vector routing, count-to-infinity problem, Link state routing		CO1, CO2				30	Final (30%)
Congestion and congestion control algorithms in network layer							
QoS, leaky bucket algorithm, Jitter, Internetworking, tunneling, fragmentation							
Transport layer: Introduction, transport services, connection establishment, data transfer & connection release, TCP segment header, Congestion control in Transport layer							
Application layer: Introduction, DNS, Web server, Optimization of Web server, Server farm							

Laboratory Experiments and Assessment Scheme

Experiment	**Teaching-Learning Method**	**CO**	**Mark of Cognitive Learning Levels**				**Mark of Psychomotor Learning Levels**	**Mark of Affective Learning Levels**	**CO Mark**
			C2	C3	C4	C6	P3	A2	
Familiarization with transmission media and orientation of CAT5	Lab Experiment, Result analysis and report	CO3							
Creating straight through and cross over cable and data transmission between hosts	Do	CO3							
The basic of Linux networking commands, administrative commands and analyzing parameters	Do	CO3							
Creating networks with Linux	Do	CO3							
Analyzing packets with Wireshirk I		CO3							
Creating network (LAN) with Packet tracer (Simulator)	Do	CO3							
Creating networks with LAN segments and networks with servers (client-server)	Do	CO3							
Creating multiple networks, configuring and implementing routing protocols	Do	CO3							
Lab Exercise Total		CO3							10%
Lab Exam	Exam	CO1							5%
		CO3							5%
Total									**20%**