		HTTP: Persistent and Non-persistent connection, Request and response message, Web caching, cookies, Transport Layer Protocols: Controlling conversation, The TCP and UDP, Port addressing, TCP congestion control, Network Security: Major security goals, Symmetric key cryptography, Public key cryptography (RSA), Message Integrity and Digital Signatures, Network Layer Protocols: IPV4 Packet header, Overview of IPV6, Routing Process: Overview of Static and Dynamic routing, Inter-LAN Communication: Default gateway and default route, Autonomous system, Addressing the Network: Types of communications, Reserved IPV4 address ranges, Historic network classes, NAT, Classless addressing, Network Address Management: Internet Assigned Numbers Authority (IANA), ISP roles, Anatomy of IPV4 address, The subnet mask, Subnetting: Basic Terminology, Subnetting a subnet or VLSM, Routing Protocols: Popular routing algorithms and metric, Flooding technique, The distance vector routing (DVR) protocol, Link-state routing, RIP and its drawback, Border gateway protocol (BGP), OSPF, MAC Protocols: Chanel partitioning, random access, taking turns, RTS/CTS protocols, Address resolution protocol (ARP), Wireless & Mobile Networks: 802.11 Architecture, MAC protocols, frame, Advanced features in 802.11, Wi-Fi & Wi-max architecture, Mobile IP, Routing calls to mobile user.
16	**Text Book**	1. Computer Networking (A Top-Down approach) - 5th or 6th Ed. by James F. Kurose and Keith Ross
17	**Reference Book**	1. Computer Networks and Internet-By Tanenbaum 2. Data Communication and Networking (3rd / 4th Edition), by -Beherouz A Forouzan TCP/IP Protocol Suite – Behrouz A. Forouzan.
18	**Course Outcomes (COs)**	Upon completing this course students will be able to: **CO1: Describe** network layers, protocols and related terms for designing computer networks. **CO2: Understand** different application layer protocols and network routing algorithms for effective design of computer networks. **CO3: Design** computer networks by applying the knowledge of computer network fundamentals such as logical addressing, routing protocols, network security etc. **CO4: Analyze** the complex computer networks and the entities involved with the day to day running of the Internet.
	Mapping of COs to POs	

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	√											
CO2	√											
CO3			√									
CO4		√										

CO No.	PO No.	Bloom's Domain / Level	Delivery Methods / Activities	Assessment Tools
CO1	PO1	Cognitive / Understanding	Class Lecture and Discussion	Midterm
CO2	PO1	Cognitive / Understanding	Class Lecture and Discussion	Midterm and Final
CO3	PO3	Cognitive / Applying	Class Lecture and Discussion	Midterm and Final
CO4	PO2	Cognitive/ Analyzing	Class Lecture and Discussion	Final

19 Teaching Strategy

Maximum topics will be covered from the textbook. For the rest of the topics, reference books will be followed. Some class notes will be uploaded on the web. White board will be used for most of the time. Multimedia projector and a PC will be used for the convenience of the students to understand codes practically. Students must participate in classroom discussions for case studies, problems solving and project developments.

20 Assessment and Marks Distribution:

Class Participation	:	10%
Assignment/Presentation	:	10%
Class Test	:	10%
Midterm Examination	:	30%
Final Examination	:	40%

21 Lecture Plan (Weekly Schedule)

Week	Lecture #	Selected Topics	Chapter #	COs	Assessment
1	1	Introduction: Computer networks & Internet, Establishing Communication rules, Quality of communication, Converged network, QoS	01	CO1	**Mid Term Exam 30**
	2	Throughput in computer networks, Delay and Packet loss in packet switched network.	01	CO2	
2	3	Encapsulation process, Addressing and layered architecture in the network.	01	CO1	
	4	Principles of Network Application: Client-server architecture, P2P network and application model. API and Socket addressing.	02	CO1	
3	5	WWW and HTTP: Persistent and Non-persistent connection, Request and response message.	02	CO2	
	6	Web caching, User-Server Interaction: Cookies.	02 **CT-1**	CO2	

4	7	Application Layer Protocols: DNS services, E Mail services, FTP.	02	CO2	
	8	SMTP, POP, POP3, IMAP.	02	CO2	
5	9	IP Addressing (Class full addressing).	Web	CO3	
	10	IP Addressing (Continued). Network Security.	Web & 08	CO3	
6	11	Symmetric Key Cryptography Techniques (Monoalphabetic Cipher, Polyalphabetic Cipher.	08	CO3	
	12	Transport Layer Protocols: Controlling conversation, The TCP and UDP	02	CO2	
7	13	Network Layer Protocols: IPV4 Packet header, Overview of IPV6	04	CO2	
	14	Inter-LAN Communication: Default gateway and default route, Autonomous system Routing Process: Overview of Static and Dynamic routing	04	CO2	
8	**Midterm Examination**				
9	15	Classless addressing	Web	CO3	
	16	Classless addressing (Continued), NAT, Internet Assigned Numbers Authority (IANA), ISP roles	Web 04	CO3	
10	17	Anatomy of IPV4 address, The subnet mask	04 **CT-2**	CO3	
	18	Subnetting: Basic Terminology, Subnetting a subnet or VLSM	04	CO4	
11	19	Network Security: Asymmetric key cryptography	08	CO2	
	20	Public key cryptography (RSA) Practice problems in RSA	08	CO4	Final Exam 40
12	21	Routing Protocols: Popular routing algorithms and metric, Flooding technique	05	CO2	
	22	The distance vector routing (DVR) protocol Link-state routing	05	CO4	
13	23	RIP and its drawback, Border gateway protocol (BGP), Wireless Networking, RTS/CTS protocols	05, 06	CO2	
	24	Address resolution protocol (ARP) Reverse Address Resolution Protocol (RARP) Dynamic Host Configuration Protocol (DHCP)	06	CO2	
14	25	Mobile Networks: Wi-Fi & Wi-max architecture	06	CO2	
	26	Final Exam Review Class			
15	**Final Exam**				