

Course Code	Course Name	Teaching Scheme	Credits Assigned					
		Theory	Practical	Tutorial	Theory	TW/ Practical	Tutorial	Total
ETC603	Computer Communication Networks	04	--	--	04	--	--	04

Course Code	Course Name	Examination Scheme								
		Theory Marks					Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam					
		Test 1	Test 2	Ave. Of Test 1 and Test 2						
ETC603	Computer Communication Networks	20	20	20	80	-	-	-	100	

**Course pre requisite:** ETC 502 Analog Communication

**Course Objective:**

- To introduce analysis and design of computer and communication networks.
- To understand the network layered architecture and the protocol stack.

**Course Outcomes:**

**Upon completion of the subject, students will be able to:**

- Assemble the components of a PC and install one or more network operating systems resulting in a functioning
- Design a small or medium sized computer network including media types, end devices, and interconnecting devices that meets a customer's specific needs.
- Perform basic configurations on routers and Ethernet switches.
- Demonstrate knowledge of programming for network communications
- Learn to simulate computer networks and analyze the simulation results
- Troubleshoot connectivity problems in a host occurring at multiple layers of the OSI model
- Develop knowledge and skills necessary to gain employment as computer network engineer and network administrator.

<b>Module No.</b>	<b>Topics</b>	<b>Hrs.</b>
<b>1.</b>	<b>Network Architectures, Protocol layers, and their Service Models:</b>	<b>04</b>
	<b>1.1</b> OSI-RM model and TCP/IP protocol	
<b>2</b>	<b>Principles of Network Applications:</b>	<b>10</b>
	<b>2.1</b> Application layer protocols such as HTTP, FTP, and SMTP.	
	<b>2.2</b> Peer-to-Peer File Sharing Protocols and Architectures	
	<b>2.3</b> ISPs and Domain name systems, Socket API and network socket programming	
<b>3</b>	<b>3.1 Reliable and Unreliable Transport-layer protocols:</b>	<b>10</b>
	<b>3.2</b> TCP and UDP, Port numbers, Multiplexing and de-multiplexing	
	<b>3.3</b> Flow control and congestion control. fairness delay, jitter, and loss in packet-switched networks	
	<b>3.4</b> Bandwidth, throughput, and quality-of-service	
<b>4</b>	<b>4.1 Network layer Services and Protocols</b>	<b>10</b>
	<b>4.2</b> Switching fabric, routing and forwarding, queues and buffering	
	<b>4.3</b> Virtual-circuit and datagram networks, internet protocol. IPv4 and IPv6 tunneling	
	<b>4.4</b> Link State and Distance Vector algorithms, Routing in the Internet RIP, OSPF, and BGP	
	<b>4.5</b> Broadcast and multicast, handling mobility	
<b>5</b>	<b>Data link layer Services and Protocols:</b>	<b>10</b>
	<b>5.1</b> Link-layer and its services, Ethernet, hubs, bridges, and switches	
	<b>5.2</b> Link-layer addressing, ATM and MPLS	
	<b>5.3</b> Local area networks and IEEE 802.11 wireless LANs, multiple-access protocols. Random access, efficiency of pure and slotted ALOHA, CSMA, CSMA/CD, and CSMA/CA	
<b>6</b>	<b>Introduction to Physical-layer Services and Systems</b>	<b>08</b>
	<b>6.1</b> Introduction to physical media, Coax, fiber, twisted pair, DSL, HFC, WiMax, cellular, satellite, and telephone networks, bit transmission, frequency division multiplexing. time division multiplexing	
<b>Total</b>		<b>52</b>

**Recommended Books:**

1. Andrew Tanenbaum, “*Computer Networks*”, PHI New Dehli,
2. Natalia Olifer and Victor Olifer, “*Computer Networks*”, Wiley India, New Delhi
3. J. F. Kurose and K. W. Ross, “*Computer Networking: A Top-Down Approach*”, Pearson Publication, 5th Edition, March 2009
4. L. Garcia et al, “*Communication Networks*”, McGraw Hill Publication, 2nd Edition
5. B. Forouzan, “*Data Communication and Networking*”, McGraw Hill Publication, 5th edition.

**Internal Assessment (IA):**

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of two tests should be considered as final IA marks

**End Semester Examination:**

1. Question paper will comprise of 6 questions, each of 20 marks.
2. Total 4 questions need to be solved.
- 3 Question No.1 will be compulsory and based on entire syllabus wherein sub questions for 2 to 5 marks will be asked.
4. Remaining questions will be selected from all the modules.