ITE~~317~~ 1	**Data Communication and Computer Networks**	L	T	P	C
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Prerequisite					
Objectives	• To study the foundational principles, architectures, and techniques employed in computer networks. • To study the concepts of communication networks, protocols and their performance.				
Outcomes	Students shall be able to • Understand about working of Intranet, LAN, WAN, MAN setups, different topologies. • Gain familiarity with common networking protocols and algorithms • Implement network protocols and analyze its performance.				
Unit I	**INTRODUCTION TO COMPUTER NETWORKS** Networking principles; switching - circuit switching, packet switching, frame relay, cell switching, multiple access.				
Unit II	**COMMUNICATIONS NETWORK PROTOCOLS** Network protocol (syntax, semantics, and timing); Protocol suites (OSI and TCP/IP); Layered protocol software (stacks): Physical layer networking concepts; data link layer concepts; network layer concepts; transport and application layer concepts; Network Standards and standardization bodies.				
Unit III	**LOCAL AND WIDE AREA NETWORKS** LAN topologies (bus, ring, star), LAN technologies (Ethernet, token Ring, Gigabit Ethernet), Error detection and correction, Carrier sense multiple access networks (CSMA), Large networks and wide areas, Protocols (addressing, congestion control, virtual circuits, quality of service). **Interne**t - addressing, routing, end point control; Internet protocols - IP, TCP, UDP, ICMP, HTTP, CIDR				
Unit IV	**ROUTING AND CONGESTION CONTROL ALGORITHMS** Flooding; Minimal spanning trees; Bellman Ford, Dijkstra's, OSPF, BGP shortest path algorithms; The leaky bucket, floyd warshall and Random Early Detection congestion methods; **Data security and integrity:** Fundamentals of secure networks; cryptography; Encryption and privacy: Public key, private key, symmetric key; Authentication protocols; Packet filtering; Firewalls; Virtual private networks; Transport layer security.				
Unit V	**NETWORK MANAGEMENT AND PERFORMANCE ANALYSIS OF NETWORKS** Overview of the issues of network management; Domain names and name services; Issues for Internet service providers (ISPs); Quality of service issues: performance, failure recovery.				
Text Books	1. W. Stallings, Data & Computer Communications, Prentice-Hall, 2005. 2. A. S. Tanenbaum, Computer networks, Prentice-Hall,2005. 3. Behrouz A Forouzan, Data Communications and Networking, Tata Mc-grawhill, 2007. 4. I. Mitrani, Modelling of Computer and Communication Systems, Cambridge, 1987. 5. J.Walrand and P.Varaiya, High Performance Communication Networks, Harcourt Asia (Morgan Kaufmann), 2000. 6. J.F.Kurose and K.W.Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Pearson Education, 2001. 7. D. E. Comer and D.L. Stevens, Internetworking with TCP/IP, Vol.1, Prentice-Hall				
Reference Books					
MoE	Written examinations, seminar, assignments, surprise tests and quizzes				
Recommended by the Board of Studies on					
Date of Approval by the Academic Council					