**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY**

**DESIGN AND MANUFACTURING (IIITD&M) KANCHEEPURAM**

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| Course Title | Computer Networking | Course No | To be filled by the office | | | |
| Specialization | Computer Science and Engineering | Structure (IPC) | 3 | 0 | | 3 |
| Offered for | UG and DD Computer Science and Engineering | Status | Core | | Elective | |
| Pre-requisite | Computer Organization and Design | To take effect from |  | | | |
| Objectives | To introduce the basics of computer networking, error detection and correction techniques, and flow control techniques. Also an exposure to IP addressing and routing and its associated protocols would be given. A highlight of various application layer protocols and its relevance in modern networking world would be discussed. | | | | | |
| Course Outcomes | To be able to design a local area network and analyze the network using performance metrics.  To appreciate the importance of subnetting, masking, and nuances involved in setting up a  campus network. | | | | | |
| Contents of the course | Evolution of computer networks, creating a small network, Data transfer between nodes, encoding of bits in physical layer, NRZ, Manchester, Differential Manchester, Performance evaluation of a network: propagation delay, transmission delay, RTT, effective bandwidth.  (10)  Error detection techniques in Data link layer (LRC, CRC, Two dimensional parity check), Hamming Error correcting codes. Data transfer between nodes using stop and wait protocol, sliding window protocol (Go-back-n and selective reject), performance analysis of stop and wait and sliding window protocols. Flow control at data link layer. Introduction to layer-2 devices (switches, bridges) and addressing scheme at Layer-2 (MAC addresses).  (10)  Creating a small network using Ethernet (IEEE 802.3) Token Ring (IEEE 802.5), Performance evaluation of IEEE 802.3 and 802.5 networks. Introduction to Layer-3 devices, IP addresses, IPv4,IPv6, Error detection at layer-3 using Checksum. IP addressing schemes, subnetting, CIDR  (12)  Introduction to TCP/IP, IP routing, RIP, OSPF, Circuit and Packet switching, ICMP,  Introduction to networking commands: Ping, Traceroute, IPconfig, UDP, congestion control and  avoidance.  (10)  Introduction to DHCP, FTP, HTTP and other application layer protocols. (3) | | | | | |
| Text and References | **Text Book:**  1)Larry L.Peterson and Bruce S Davie, Computer Networks: A systems Approach,Morgan, 5th  Edn, 2011.  2) William Stallings, Data and Computer Communications, 10th Edn, Pearson, 2017.  **Reference Books:**   1. Andrew S. Tanenbaum, Computer Networks, 5th Edn, 2014. 2. Behrouz Forouzan, TCP/IP protocol suite, Tata McGraw Hill, 4th Edn, 2010. | | | | | |