# 19CS2204 - COMPUTER NETWORKS

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category:** | Program Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-0-0 |
| **Prerequisite:** | Knowledge in computer fundamentals and basic network essentials. | **Sessional Evaluation:**  **Univ. Exam Evaluation:**  **Total Marks:** | 40  60  100 |
| **Objectives** | * To learn the essentials of computer network layers and Transmission media. * Explore the general issues regarding MAC, Network and Transport layers. * Study various protocols in TCP/IP suite. * Understand the working principle of DNS and E-mail. | | |

|  |  |  |
| --- | --- | --- |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: | |
| CO1 | Understand the basics of computer network layers and overview on transmission. |
| CO2 | Get the design issues, and protocols of data link layer. |
| CO3 | Study various multiple access protocols, and internetworking devices. |
| CO4 | Explore the basic design issues, study various routing, and congestion control algorithms. |
| CO5 | Learn the concept of IPv4 issues and overview on transport layer issues. |
| CO6 | Understand the basic TCP issues and exposure on DNS & E-Mail. |
| **Course Content** | UNIT-I  **Introduction:** Use of Computer Networks, Network Hardware, Network Software.  **Reference Models:** TCP/IP Model, The OSI Model, Comparisons of the OSI and TCP/IP reference model.  **Physical Layer:** Guided Transmission Media.  UNIT-II  **Data Link Layer:** Design issues, Error Detection and Correction, Elementary Data Link Layer Protocols, Sliding window protocol, Examples Data link Protocols.  UNIT-III  **Multi Access Protocols:** the Channel allocation Problem.  **Multiple Access Protocols:** ALOHA, CSMA, Collision free protocols.  **Data link layer switching:** Bridges from 802.x to 802.y, local internetworking, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.  UNIT-IV  **Network Layer:** Design issues: store and forward packet switching, Services Provided to the Transport Layer, Implementation of connection less and connection oriented.  **Routing algorithms:** optimality principle, shortest path, flooding, Distance Vector Routing, the Count-to-Infinity Problem, Link State Routing, Hierarchical Routing, Congestion Control Algorithms.  UNIT-V  **Internetworking:** Connectionless Internetworking, Tunneling, Internetwork Routing, fragmentation, IPv4, IP addresses.  **Transport Layer:** The transport Service - Services provided to the upper layers, Transport Service Primitives, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery.  **The Internet Transport Protocols UDP:** Introduction to UDP, RPC.  UNIT-VI  **The Internet Transport Protocols TCP**: Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling.  **Application Layer:** Introduction, DNS, Electronic mail. | |
| **Text Books and References:** | Text Books:   1. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education. | |
| Reference Books:   1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013 2. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Edication. 3. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER. 4. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K. W. Ross, 3rd Edition, Pearson Eduction. | |
| **E-Resources** | 1. <https://nptel.ac.in/courses> | |