17CS2205- COMPUTER NETWORKS

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| **Course Category:** | Core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 2-2-0 |
| **Prerequisite:** | Knowledge in Computer Fundamentals and basic Network essentials. | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **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
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| **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 ProtocolsUNIT - III**Multiple Access Protocols:** the Channel allocation Problem, 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
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| **E-Resources** | 1. [**https://nptel.ac.in/courses**](https://nptel.ac.in/courses)
2. [**https://freevideolectures.com/university/iitm**](https://freevideolectures.com/university/iitm)
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