# 20CS2103 - COMPUTER NETWORKS

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| 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 equip the students with a general overview of the concepts of computer networks. * Familiarize the students with the standard networks layer models. * To establish the communication and their applicability. | | |

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| Course Outcomes | Upon successful completion of the course, the students will be able to: | |
| CO1 | Understand the basic concepts of computer networks. |
| CO2 | Acquire the knowledge about various types of application layer protocols. |
| CO3 | Exposure on transport layer functions. |
| CO4 | Learn the concept of IPv4 issues and supporting mechanism. |
| CO5 | Know about working principle of router and routing protocols. |
| CO6 | Understand the design issues, protocols and their applicability in data link layer. |
| Course Content | UNIT-I  **Computer networks and the Internet:** What is the Internet, the Network edge, the Network core, delay, loss, and throughput in Packet-Switched Networks, Protocol Layers and their service models.  UNIT-II  **Application Layer:** Principles of network applications, the Web and HTTP, Electronic mail in the Internet, DNS—the Internet’s directory service.  UNIT-III  **Transport Layer:** Introduction and Transport-layer Services, Multiplexing and Demultiplexing, Principles of reliable data transfer, Connectionless Transport: UDP, Connection-oriented transport: TCP.  UNIT-IV  **Introduction to Network layer:** Forwarding and Routing, Network Service Models.  **Virtual circuit and Datagram networks:** Virtual-Circuit Networks, Datagram Networks, Origins of VC and Datagram Networks.  **The internet protocol:** Datagram Format, IPv4 Addressing, ICMP.  UNIT-V  **What’s inside a router:** Input Processing, Switching, Output Processing, Where does queuing occur, the Routing Control Plane.  **Routing algorithms:** The Link-State Routing Algorithm, the Distance-Vector Routing Algorithm, Hierarchical Routing.  **Routing in the internet:** RIP, OSPF, BGP.  UNIT-VI  **The link layer:** Introduction to the Link Layer, Error-Detection and Correction Techniques, Multiple Access Links and Protocols, Switched Local Area Networks. | |
| Text Books &  References  Books | **TEXT BOOKS:**   1. Computer Networking: A Top-Down Approach, James F. Kurose, K. W. Ross, 6th Edition, Pearson Education.   **REFERENCE BOOKS:**   1. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education. 2. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition. 3. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education. 4. Computer Networks, L. L. Peterson and B. S. Davie, 4th edition, ELSEVIER. | |
| E-Resources | 1. <https://nptel.ac.in/courses> | |

**CO-PO Mapping:** 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | 2 | 2 | - | - | - | - | 2 | 3 | 3 | 1 | - | 2 |
| **CO2** | 3 | 2 | - | - | - | - | 2 | 1 | - | 1 | - | 2 |
| **CO3** | 3 | 2 | 1 | 1 | - | - | 2 | 1 | - | 1 | - | 2 |
| **CO4** | 3 | 2 | 3 | 3 | 1 | - | 2 | 1 | 1 | 1 | - | 2 |
| **CO5** | 3 | 2 | 3 | 3 | 2 | - | 2 | 1 | 1 | 1 | - | 2 |
| **CO6** | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |