20XW42 COMPUTER NETWORKS AND TCP/IP

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**Prerequisites:**

 [20XW25 COMPUTER ORGANIZATION](https://sureshbalusamy.github.io/DAMCSRegulationDocuments/curriculum/ss/2020/syllabi.html" \l "a20xw25)

 [20XW35 MICROPROCESSOR SYSTEMS AND PROGRAMMING](https://sureshbalusamy.github.io/DAMCSRegulationDocuments/curriculum/ss/2020/syllabi.html" \l "a20xw35)

**Introduction:** Network goals - Applications of Networks - Design issues for the layers - OSI Reference Model - Types of Network - Network Topologies- Analog and Digital data transmission- Data encoding- Bandwidth and data rate-.Bit Rate, Baud Rate (5)

**DATA COMMUNICATION:** Multiplexing - Synchronous and Asynchronous TDM – FDM –CDM - Switching, Circuit Switching, Packet Switching Transmission of Digital Data: Transmission Impairments - Single and Multiple bit error correction-Error Detection and Correction - Cyclic Redundancy Check Code - Hamming Code (6)

**Data Link Control and Protocols:** Line Discipline - Flow Control - Sliding Window Protocol -Random Access protocols- Ethernet – Fast Ethernet – Gigabit Ethernet – Wireless LANs- Internetworking- LAN -LAN Connections – Repeaters- Hubs - Bridge – Spanning tree-Switches – Routers. (8)

**IP:** TCP/IP Protocol Structure - Internet Protocol – IP addressing- ARP –ICMP ROUTING: Distance vector routing - Link state Routing – RIP – OSPF (8)

**TRANSPORT LAYER:**- TCP concepts - Port number - UDP – TCP-Congestion control- Quality of services (9)

**Applications:** DHCP, SNMP, SMTP - MIME , DNS, HTTP (9)

Total L: 45

**TEXT BOOKS:**  
1. Behrouz A Forouzan, “Data Communications and Networking”, Tata McGraw Hill, 2012  
2. Behrouz A Forouzan, “TCP/ IP Protocol Suite”, Tata McGraw Hill, 2010.  
  
**REFERENCES:**  
1. Kevin Fall R and Richard Stevens W, "TCP/IP Illustrated, Volume 1: The Protocols”, Addison-Wesley, 2011.  
2. , Keith Ross, “Computer Networking: A Top-Down Approach”, Pearson Addison-Wesley, 2017.  
3. Douglas Comer, “Internetworking with TCP/IP”, Prentice Hall, 2014.  
4. William Stallings, "Data and Computer Communications", Prentice Hall, 2014.

### 20XW46 COMPUTER NETWORKS AND TCP/IP LAB

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1. Familiarize with GNS3 simulator.  
2. Implement Hamming code and CRC.  
3. Implement a primitive email server.  
4. Familiarize with packet capturing tools in Java and Wireshark.  
5. Implement a simple firewall system.  
6. Analyse the existing routing protocols and implement any one of them.  
7. Write a program where a single entity can communicate with other entities by using IP-multicasting.  
8. Assignments using the network simulator.