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**Course Code: CSE302**

**Semester: V**

## **Computer Networks**

### **COURSE OBJECTIVE:**

- This course will help the learner to analyse various application layer protocols and its implication and criticize the TCP flow control, TCP congestion control mechanism and evaluate various inter-domain, intra-domain routing protocols and link layer protocols.

### **UNIT - I**

**15 Periods**

**Computer Networks and the Internet:** Introduction about Internet - The Network Edge - The Network Core - Delay, Loss, and Throughput in Packet-Switched Networks - Protocol Layers and Their Service - **Application Layer:** The Web and HTTP - FTP - Electronic Mail in the Internet - DNS - The Internet's Directory Service - Peer-to-Peer Applications

### **UNIT - II**

**15 Periods**

**Transport Layer:** Introduction and Transport-Layer Services - Multiplexing and Demultiplexing - **Connectionless Transport:** UDP - Principles of Reliable Data Transfer - **Connection-Oriented Transport:** TCP - Principles of Congestion Control - TCP Congestion Control

### **UNIT - III**

**15 Periods**

**The Network Layer:** Introduction - Virtual circuits and datagram networks - Inside a Router - The Internet protocol (IP) forwarding and addressing in the Internet - Routing algorithms - Routing in the Internet - Broadcast and multicast routing

### **UNIT - IV**

**15 Periods**

**The Link Layer:** Introduction to the link layer - Error detection and correction techniques - Multiple access links and protocols - Switched Local area networks - Link virtualization - Data centre networking - Wireless link & network characteristics - 802.11 wireless LAN - **Network Management:** The Network management - The infrastructure for Network management - The Internet standard management framework

### **TEXTBOOK**

1. James F. Kurose, and Keith W. Ross. Computer Networking: A Top-down Approach. Pearson Education, Seventh Edition, 2017.

### **REFERENCES**

1. William Stallings. *Data and Computer Communications*. Prentice Hall of India, Tenth Edition, 2014.

2. Behrouz A Forouzan and Firouz Mosharraf. *Computer Networks - A Top-Down Approach*. Tata McGraw Hill. Indian Edition, 2012.
3. Larry L Peterson and Bruce S. Davie. *Computer Networks: A Systematic Approach*, Elsevier. Seventh Edition, 2011.
4. Andrew S Tanenbaum and David J. Wetherall. *Computer Networks*. Pearson Education. Fifth Edition, 2010.

## ONLINE MATERIALS

1. NPTEL-  
[https://nptel.ac.in/courses/106105081/https://onlinecourses.nptel.ac.in/noc18\\_cs38/preview](https://nptel.ac.in/courses/106105081/https://onlinecourses.nptel.ac.in/noc18_cs38/preview)
2. MIT Courseware: <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/>
3. Coursera course: <https://www.coursera.org/courses?query=computer%20network>

## UNITWISE LEARNING OUTCOMES

Upon successful completion of this course, the learner will be able to

Unit I	<ul style="list-style-type: none"> <li>➤ Discuss about the networking principles and its Quality of Service parameters</li> <li>➤ Demonstrate the application layer functionalities</li> </ul>
Unit II	<ul style="list-style-type: none"> <li>➤ Categorise various routing protocols</li> <li>➤ Demonstrate IPv4 and IPv6 packet and addressing structures</li> </ul>
Unit III	<ul style="list-style-type: none"> <li>➤ Assemble Internet- Transport layer services and its significance in networking</li> <li>➤ Analyse the TCP congestion control strategies</li> </ul>
Unit IV	<ul style="list-style-type: none"> <li>➤ Describe link layer functionalities and classify various multiple link access protocols</li> <li>➤ Evaluate the network management framework</li> </ul>

## COURSE LEARNING OUTCOMES

Upon successful completion of this course, the learner will be able to

- Analyse the networking principles and various network QoS metrics
- Discuss about various application layer protocols
- Compare various routing protocols in the network layer and evaluate Internet packet formatting and forwarding
- Criticise Transport layer services in Internet and evaluate TCP congestion and flow control mechanisms
- Demonstrate link layer functionalities and multiple link access methods
- Analyse Internet network management framework