

CE358: COMPUTER NETWORKS

Credits and Hours:

Teaching Scheme	Theory	Practical	Tutorial	Total	Credit
Hours/week	3	2	-	5	4
Marks	100	50	-	150	

Pre-requisite courses:

- Data Communication and Networking

Outline of the Course:

Sr. No.	Title of the unit	Minimum number of hours
1.	Computer Networks and the Internet	04
2.	Application Layer	07
3.	Transport Layer	17
4.	The Network Layer	08
5.	The Link Layer and Local Area Networks	07
6.	Current Trends in computer Network	02
	Total hours (Theory) :	45
	Total hours (Lab) :	30
	Total hours :	75

Detailed Syllabus:

1.	Computer Networks and the Internet	04 Hours	08%
	What Is a Protocol, Access Networks, Physical Media, Packet Switching & Circuit Switching, Delay, Loss, and Throughput in Packet-Switched Networks-Overview, Queuing Delay and Packet Loss, End-to-End Delay, Throughput in Computer Networks, Primer on Latency and Bandwidth		
2.	Application Layer	07 Hours	16%
	Principles of Network Applications, The Web and HTTP, File Transfer: FTP, SMTP, DNS, Optimizing Application Delivery		
3.	Transport Layer	17 Hours	38%
	Introduction and Transport-Layer Services, Multiplexing and Demultiplexing, Connectionless Transport: UDP & Building Blocks		

	of UDP, Principles of Reliable Data Transfer, Connection-Oriented Transport: TCP, Principles of Congestion Control & Building Blocks of TCP		
4.	The Network Layer	08 Hours	18%
	Introduction, Virtual Circuit and Datagram Networks, What's Inside a Router, The Internet Protocol (IP): Forwarding and Addressing in the Internet, Routing Algorithm(SS)		
5.	The Link Layer and Local Area Networks	07 Hours	16%
	Introduction to the Link Layer, Multiple Access Protocols, Link Layer Addressing(SS), Ethernet(SS)		
6.	Current Trends in computer Network	02 Hours	04%
	Limitations of TCP/IP protocol, Need of SDN, SDN architecture, Functionality of different SDN plane, Current trends*.		

* Teacher will decide content of current trends and communicate to students well in advance.

- **Course Outcome (COs):**

At the end of the course, the students will be able to

CO1	Measure and Analyse different network parameters.
CO2	Understand working of application layer protocols.
CO3	Understand and Analyse transport layer services and its impacts on data rate.
CO4	Understand basic functionality of network layer devices.
CO5	Understand functionality of multiple access protocol.
CO6	Analyse traditional network and get familiar with Software defined networking.

- **Course Articulation Matrix:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	3	1	-	-	-	-	-	-	-	2	-
CO2	3	3	1	3	1	-	-	-	-	-	-	-	1	-
CO3	3	3	1	3	1	-	-	-	-	-	-	-	1	-
CO4	3	3	1	3	1	-	-	-	-	-	-	-	1	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	-	-	-	-	3	-	-	-	-	-	-	-	-	-

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

If there is no correlation, put “-”

Recommended Study Material:

❖ **Text Book**

1. Computer Networking: A Top-Down Approach James F. Kurose, University of Massachusetts, Amherst Keith W. Ross, Polytechnic University, Brooklyn

❖ **Reference Materials**

1. Computer Networks by Andrew S Tanenbaum.
2. High Performance Browser Networking by Ilya Grigorik
3. Data Communication and Networking by Behrouz Forouzan

❖ **Web Materials**

1. www.ietf.org – For drafts
2. www.ieee.org – For standards and technical research papers
3. <http://nptel.iitm.ac.in/courses.php?disciplineId=117>