

Course Code	050020501			
Category	Core Subject			
Course Title	Computer Networking			
Scheme and Credits	Theory	Tutorial	Lab	Credits
	3	1	0	4
Pre-requisites (if any)	Basic Concept of Data Structures, Operating systems, Programming Language			

1. Learning Objectives:

1	Describe how computer networks are organized with the concept of layered approach
2	Describe how packets in the Internet are delivered.
3	Analyze the contents in a given Data Link layer packet, based on the layer concept.
4	Design logical sub-address blocks with a given address block
5	Decide routing entries given a simple example of network topology
6	Describe what classless addressing scheme is
7	Describe how routing protocols work

2. Course Contents

Unit	Course Content	Weightage
I	Introduction Network Hardware & Software, OSI Reference Model, TCP/IP Model, and Comparison of the OSI & TCP/IP model. Network Terminologies: Signals, amplitude, frequency, wavelength, bitrate, baudrate The Physical Link layer: Guided Transmission Media, Physical Layer Standard.	20%
II	The Data Link Layer: Need for Data Link Control, Service provided by the Data Link Layer, Frame Design Consideration, Flow control Mechanism, Data Link Error control, Error Control in Stop-and-wait Mechanism & Sliding Window Mechanism, Sequence numbering, Piggybacking Acknowledgements, Data Link Management.	25%
III	MAC Protocols: Random access Protocols – ALOHA, IEEE 802.3 Ethernet, CSMA/CD	25%

	The network layer: network layer design issue, purpose of network layer, Functions of the Network Layer, Introduction to Internet Protocol: IPv4 Format, Routing Algorithms: Static Routing, Dynamic Routing	
IV	Transport Layer: Transport layer design issue, Transport of network layer, Functions of the Transport Layer, Connection oriented and connection less transmission, Difference between TCP and UDP	15%
V	Application Layer: Domain name system, Electronic Mail–SMTP, the World Wide Web	15%

3. Text Books:

1. “Andrew S Tanenbaum, David. J. Wetherall”, “Computer Networks”, 5th Edition, Pearson Education
2. Bhushan H Trivedi, “Computer Networks”, Oxford University Press
3. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, Fourth Edition
4. Computer Networking- A Top-Down approach, 5th edition, Kurose and Ross, Pearson
5. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Fifth Edition, Morgan Kaufmann Publishers, 2011.
6. Computer Networking and the Internet (5th edition), Fred Halsall, Addison Wesley
7. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, “Computer Networks: An Open Source Approach”, Mc Graw Hill Publisher, 2011.

4. Webilography :

- 1) <https://technet.microsoft.com/en-us/library/bb727023.aspx>
- 2) <https://docs.python.org/2/howto/sockets.html>
- 3) <https://www.aircrack-ng.org/>
- 4) <https://www.kismetwireless.net/>
- 5) Download Wireshark from its official webpage, it is a network packet analyzer
<https://www.wireshark.org/>

5. Accomplishment of the student after completing the course: :

At the end of the course, the student should be able to:

1. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
2. Have a basic knowledge of the use of cryptography and network security.
3. Specify and identify deficiencies in existing protocols, and then go on to formulate new and better protocols.
4. Analyze, specify and design the topological and routing strategies for an IP based networking infrastructure