CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF TECHNOLOGY & ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CS362: COMPUTER NETWORKS

Credit and Hours:

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

Outline of the Course:

Sr. No.	Title of the unit	Minimum Number of Hours
1	Introduction to Computer Networks	04
2	Data Link Layer	08
3	Medium Access Control Sub Layer	10
4	Network Layer	12
5	Transport Layer	08
6	Application Layer	03

Total Hours (Theory): 45

Total Hours (Lab): 30

Total Hours: 75

Detailed Syllabus:

1	**Introduction to Computer Networks**	**04 Hours**	**09%**
1.1	Uses of computer network		
1.2	network hardware, network software		
1.3	OSI model, TCP/IP model, Comparison of OSI and TCP/IP model		
1.4	Example network		
2	**Data Link Layer**	**08 Hours**	**18%**
2.1	Design Issues		
2.2	framing, error control, flow control		
2.3	Error detection and correction		
2.4	Elementary data link protocols		
2.5	simplex, stop and wait, sliding window protocol, HDLC		
3	**Medium Access Control Sub Layer**	**10 Hours**	**22%**
3.1	The channel allocation problem, Multiple Access protocols: ALOHA, CSMA, Collision Free Protocols,		
3.2	Limited Contention Protocols, Wavelength Division Multiple Access Protocols		
3.3	Wireless LAN protocols; Ethernet: Traditional Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet, IEEE 802.2: LLC, Data link layer switching		
4	**Network Layer**	**12 Hours**	**27%**
4.1	Implementation of connection oriented and connection less service, Comparison of virtual circuit and datagram subnets, Routing algorithms		
4.2	Shortest path routing, Flooding, Distance vector routing, Link state routing, Hierarchical routing, Broadcast routing, Multicast routing, Routing for mobile host		
4.3	Routing in ad hoc network, Congestion control algorithms principles, Prevention policies		
4.4	Congestion control in virtual circuit subnets, Congestion control in		

datagram subnets, Load shedding,

4.5 virtual circuit, Connectionless internetworking, Tunneling, Internetwork routing and fragmentation

4.6 The network layer in the internet: The IP protocol, IPaddresses

4.7 Internet control protocol, OSPF, BGP

5	**Transport Layer**	**08 Hours**	**18%**

5.1 The transport service: Services provided to the upper layers

5.2 Transport service primitives, Socket elements of transport protocols addressing

5.3 Connection establishment, Connection release, Flow control

5.4 Multiplexing, Crash recovery the transport protocol: UDP, TCP

6	**Application Layer**	**03 Hours**	**06%**

6.1 DNS: The DNS name space, Resource records, Nameservers

6.2 Electronic mail: Architecture and services

6.3 World Wide Web: Architectural overview, HTTP.

Course Outcome:

After completion of the course students will be able to

CO1	Analyze layered network architecture and passage of data over communication links
CO2	Analyze delay models in Data Networks using Queueing Systems for messaging and delay sensitive applications
CO3	Design and analyze routing algorithms for Internet and multi-hop autonomous networks
CO4	Analyze flow and rate control algorithms between a sender and receiver in wide area networks
CO5	Apply the network fundamentals to analyze performance.
CO6	Use key networking algorithms in simulation.

Course Articulation Matrix:

	PO01	PO02	PO03	PO04	PO05	PO06	PO07	PO08	PO09	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)Ifthere

is no correlation, put "-"

Recommended Study Material:

- **Text Books:**

  1. Computer Network, Andrew S. Tanenbaum, Prentice Hall PTR

- **Reference Books:**

  1. Introduction to Data Communication and Networking by Behrouz Forouzan, McGraw Hill
  2. Data and Computer Communications, William Stallings, Prentice Hall

- **Reference Books:**

  1. http://www.cisco.com
  2. http://compnetworking.about.com