

<b>Department Name/Institute Name</b>	Department of Computer Science and Engineering / Chitkara University Institute of Engineering & Technology.	
<b>Program Name</b>	BE -Computer Science and Engineering	
<b>Course Code</b>	CSL3203	
<b>Course Name</b>	Computer Networks	
<b>Lecture / Tutorial (per week)</b>	3-0-0	<b>Course Credits</b> 3
<b>Course Coordinator Name</b>	Er. Vidhu Baggan	

### 1. Course Objectives

The purpose of this course is to inculcate the skill to infer computer networks in our students.  
At the successful completion of this course a student will be able to :

1. Categorize and interrelate the functions of layers of OSI and TCP/IP reference model.
2. Interpret the error detection as well as correction at Layer 2 and at Layer 3.
3. Design and configure network topologies with interior routing protocols.
4. Summarize the mechanism of Cellular, Satellite and MPLS Networks.
5. Interpret the rationality behind congestion in networks and quality of service.
6. Gauge the existing protocols, who carry the onus of network communication at Application layer.

### 2. Recommended Books:

1. Data Communications and Networking' by Forouzan, 5TH edition.
2. Data Communications and Networking' by Forouzan, 4TH edition.
3. Computer Networks' By Andrew S. Tanenbaum Fourth edition, Pearson Education
4. Data Communications and Networking' by Forouzan, 2nd edition.
5. Data and computer Communications' by William Stallings, 8<sup>th</sup> edition, Pearson
6. CCNA Cisco Certified Network Associate Study Guide', by Todd Lammle, Wiley, 7<sup>th</sup> edition
7. Computer Networking: A Top-Down Approach', by James Kurose and K.W. Ross, Pearson Education, 3<sup>rd</sup> edition

### 3. Other readings and relevant websites

Sr No.	Link of Journals, Magazines, websites and Research Papers
1.	<a href="http://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html">http://nptel.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html</a>
2.	<a href="http://nptel.ac.in/courses/106105081/1">http://nptel.ac.in/courses/106105081/1</a>
3.	<a href="http://www.brainbell.com/tutorials/Networking/">http://www.brainbell.com/tutorials/Networking/</a>
4.	<a href="https://learningnetwork.cisco.com/index.jspa?ciscoHome=true">https://learningnetwork.cisco.com/index.jspa?ciscoHome=true</a>
5.	<a href="http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-263j-data-communication-networks-fall-2002/lecture-notes/">http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-263j-data-communication-networks-fall-2002/lecture-notes/</a>
6.	<a href="https://www.slideshare.net/VidhuBaggan1/mpls-by-vidhu">https://www.slideshare.net/VidhuBaggan1/mpls-by-vidhu</a>

### 4. Recommended Tools and Platforms:

Cisco Packet Tracer-6.3 or above versions

## 5. Course Plan

Lecture Number	Topics
1-2	Introduction: Uses of Computer networks, Network hardware (Topologies, components of communication, modes of transfer, type of connections), Network software (protocols and standards)
3-4	Seven-Layer OSI architecture of ISO, Concepts of Layer Protocols and Layer interfaces
5-6	TCP/IP reference model , Comparison of OSI and TCP/IP reference models Activity1 :Role Modeling of Reference Models
7-8	<b>Physical Layer:</b> Transmission Media, Wireless Transmission, Switching methods
9	<b>Data Link Layer:</b> Design Issues (Framing, Character stuffing, bit stuffing, byte stuffing)
10-11	Error Detection and Correction- Parity Bit, CRC, Check Sum ,Hamming code & distance
12-14	Data link protocols: Noiseless Channels- Elementary data link protocols, Stop and Wait , Noisy Channel: Stop and Wait Automatic Repeat Request, go back-n, selective repeat
15	Medium Access sub Layer : protocols - Random Access
16-17	Controlled Access, Channelization
18	Wired LANs: Ethernet: Bridged, Switched, Fast, Gigabit, Wireless Lans, Connecting Devices
19	Wireless WANs, Cellular Telephone, Satellite Networks, SONET/SDH, MPLS
20-21	Network Layer: IPv4 protocol, IP addresses, Subnets, IP addresses, IPv6.
22	ICMP, IGMP, Unicast Routing, Multicast Routing, Distance Vector Routing, Link state Routing

23	Static and Dynamic routing algorithms- Shortest Path Routing, Flooding
24-26	Routing Protocols (Static and Dynamic): RIPv2, OSPF, EIGRP Routing Protocol.
27-30	Access Control Layer, Network Address Translation
31-32	Transport Layer: Transport services, elements of transport protocol, Congestion control algorithms
33	Quality of Service, Integrated Services, Differentiated Services
34-36	Application Layer: DNS, SMTP, SNMP,IMAP, FTP, POP3, HTTP, HTTPS VPN, TELNET, SSH , WWW, Cookies, Proxy Server

**6.Evaluation Scheme:**

Component 2 *	Sessional Tests (STs)	40
Component 3 **	End Term Examination	60
	<b>Total</b>	<b>100</b>

\* There are three Sessional Tests (STs) for all theory papers. The average of best two will be considered.

\*\* The End Term Comprehensive examination will be held at the end of semester. The mandatory requirement of 75% attendance in all theory classes is to be met for being eligible to appear in this component.

**7. Syllabus with weightage**

<b>Contents</b>	<b>Lectures</b>	<b>Weightage(%age)</b>
Introduction Concepts: Goals and Applications of Networks, Network structure and architecture, The OSI reference model, services, Network Topology Design - Delay Analysis, Backbone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.	8	25
Medium Access sub layer: Medium Access sub layer - Channel Allocations, LAN protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.	10	25
Network Layer: Network Layer - Point - to Point Networks, routing, Congestion control Internetworking -TCP / IP, IP packet, IP address, IPv6.	11	25
Transport Layer: Transport Layer - Design issues, connection management, Session Layer-Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, TCP - Window Management.	3	15
Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application. Example Networks - Internet and Public Networks.	4	10

**This Document is approved by:**

<b>Designation</b>	<b>Name</b>	<b>Signature</b>
Course Coordinator	Er. Vidhu Baggan	
Associate Dean	Er. Sudha Goyal	
Deputy Dean	Er. Meenu Khurana	
Date	08 Jan. 17	