

# **Syllabus for Bachelor of Technology**

# **Computer Engineering**

Subject Code: 01CE0410
Subject Name: Computer Network
B.Tech. Year – II

**Objective:** Students are expected to learn basics of Computer Network which will help them to build LAN, MAN and WAN. The course is designed to let students demonstrate an understanding of the protocols, Ip address and Routing algorithms. Additionally, to demonstrate a basic understanding of various internetworking devices.

**Credits Earned:** 4 Credits

**Course Outcomes:** After completion of this course, student will be able to

- Understand the basic terminologies used in networking, various networking topologies, switching techniques and layered architecture of computer network. (Understand)
- Understand various networking protocols of application layer. (Understand)
- Distinguish connection oriented and connection less protocols used for reliable data transfer and relate with flow control and congestion control. (Analyse)
- Apply the concept of IP addressing and subnetting for IP based networks also demonstrate routing protocols. (Apply)
- Demonstrate error correction and error detection techniques in data link layer, use of random access and CSMA protocol. (Apply)

**Pre-requisite: NA** 

## **Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tut	orial/	
							Practical		
							Marks		Total
Theory	Tutorial	Practical	Greats	ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term work (TW)	Marks
3	0	2	4	50	30	20	25	25	150

#### **Contents:**

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Unit	Topics					
	Topics					
1	Introduction					
	Internet today, Data communication, Categories of Network,					
	Layered approach, Understanding of Delay and its types, TCP/IP					
	Reference model, Transmission Mode, Transmission Media,					



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	Total Hours	45			
	Protocols, CSMA, CSMA/CD, CSMA/CA, VLAN.				
	Control, Error Control, Multiple access protocols, Random Access				
	and Error Detection techniques, Parity, Checksum, Framing, Flow				
	Data link layer services, Data link layer design issues, Error correction				
5	Data Link Layer	9			
	Distance Vector Routing, Link State routing, OSPF, EIGRP.				
	routing, Multicast Routing, Inter domain and intra domain routing,				
	Network Layer functionalities, Network Layer design Issues, Unicast				
4	Network Layer	9			
	and Selective Repeat, Flow Control, Congestion Control.				
	Protocol: TCP and UDP, Principles of Reliable data transfer: Go-BACK-N				
	Introduction to Transport layer and its services, Transport layer	9			
3	Transport Layer				
	Domain name server, SMTP, SNMP, FTP, DHCP: Request and Response.				
_	Web and HTTP, File Transfer: FTP, Electronic mail in the internet,				
2	Application Layer	8			
	Switching, Packet Switching.				
	Network: LAN, WAN, MAN, PAN, Switching Techniques: Circuit				
	Network Topologies: Star, Bus, Ring, Mesh, Hybrid, Types of				

#### **References:**

- 1. Andrew S. Tanenbaum, "Computer Networks", 5th Edition
- 2. Behrouz A. Forouzan, (2010), "Data Communications and Networking", 5th Edition
- 3. Kurose and Ross, Computer Networking, Pearson, 8th Edition.
- 4. William Stallings, Data and computer Communication, Pearson, 10th Edition.

## **Suggested Theory distribution:**

Distribution of Theory for course delivery and evaluation								
Remember	Understand	Apply	Analyse	Evaluate	Create			
10 %	35 %	10 %	35 %	5 %	5 %			

### **Laboratory work:**

Laboratory work will be based on cisco packet tracer which includes experiments on LAN, WAN, MAN, various topologies, implementation of different protocols like HTTP, DHCP, DNS, E-mail and routing algorithms.

### **Instructional Method:**

a) The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.



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- b) The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c) Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d) Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

# **Supplementary Resources:**

- a) https://www.netacad.com/about-networking-academy/packet-tracer/
- b) http://vlssit.iitkgp.ernet.in/ant/ant/
- c) http://www.nptelvideos.in/2012/11/computer-networks.html
- d) http://www.networkworld.com/blogs
- e) https://www.tutorialspoint.com/ipv6/