

**Syllabus for Bachelor of Technology**  
**Computer Engineering/Information Technology**

**Subject Code: 01IT0401**

**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, network matrices and applications of the Internet. Additionally, to demonstrate a basic understanding of various internetworking devices.

**Credits Earned:** 5 Credits

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

- Describe the Importance of computer networks and various performance metrics.
- Distinguish and relate various protocols in layered architecture of computer networks.
- Explain various topological and routing strategies for IP based networks.
- Prepare client server application using socket programming.
- Compare various devices and protocols that builds computer network.

**Pre-requisite of course:** NA.

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term work (TW)	
4	0	2	5	50	30	20	25	25	150

**Contents:**

Unit	Topics	Content Hours
1	<b>Introduction:</b> Basic Understanding of Computer Network and Internet, Transmission Media, Switching Techniques, Network Metrics, OSI Model, TCP/IP Model.	8
2	<b>Application Layer :</b> Principles of Network applications, Web & HTTP, Domain Name System, Electronic Mail, Socket Programming.	10
3	<b>Transport Layer :</b> Transport layer Protocols and its services, Multiplexing and Demultiplexing, User Datagram Protocol, Transmission Control Protocol, Principles of Congestion Control.	12
4	<b>Network Layer :</b> Introduction, Connection Oriented and Connectionless networks, Interconnecting Devices, IP Protocol and Subnets, Distance Vector Routing, Link State Routing, Hierarchical Routing.	12
5	<b>Datalink Layer :</b> Data Link layer Design Issues, Link layer services, error-detection and correction techniques, Multiple Access Protocols (MAP), Ethernet.	10
	<b>Total Hours</b>	<b>52</b>

**References:**

1. Kurose and Ross, Computer Networking- A Top-Down approach, Pearson
2. Forouzan, Data Communication Networking TMH Publication
3. Andrew S. Tanenbaum, Computer Networks PHI Publication
4. William Stallings, Data and computer Communication, Pearson.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
20%	20%	30%	15%	10%	5%

**Suggested List of Experiments:**

1. Introduction to Cisco Packet Tracer and configuring various network devices, hosts & transmission media.
2. Configuration of DHCP Server in Packet Tracer Software and analysis of DHCP messages.
3. Configuration of HTTP Server in Packet Tracer Software and analysis of HTTP request & response messages.
4. Configuration of DNS Server with Recursive & Iterative approach in Packet Tracer Software.
5. Configuration of E-mail Server in Packet Tracer Software.
6. Study of basic network commands.
7. Study of Network devices configuration commands.
8. Echo application using Socket programming in C/Java/Python.
9. Chat application using Socket programming in C/Java/Python.
10. Configure Link State Vector Routing (e.g. OSPF) in Packet Tracer Software.
11. Configure Distance Vector Routing (e.g. RIP) in Packet Tracer Software.

**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.
- 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:

1. <https://www.netacad.com/about-networking-academy/packet-tracer/>
2. <http://vlssit.iitkgp.ernet.in/ant/ant/>
3. <http://www.nptelvideos.in/2012/11/computer-networks.html>
4. <http://www.networkworld.com/blogs>
5. <https://www.tutorialspoint.com/ipv6/>