

<b>COURSE TITLE</b>	<b>COMPUTER NETWORK</b>
<b>COURSE CODE</b>	<b>01AI0404</b>
<b>COURSE CREDITS</b>	<b>4</b>

**Objective:**

- 1 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 metrics and applications of the Internet. Additionally, to demonstrate a basic understanding of various internetworking devices.
- 2 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 metrics and applications of the Internet. Additionally, to demonstrate a basic understanding of various internet working devices.

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

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

**Pre-requisite of course:**NA

**Teaching and Examination Scheme**

<b>Theory Hours</b>	<b>Tutorial Hours</b>	<b>Practical Hours</b>	<b>ESE</b>	<b>IA</b>	<b>CSE</b>	<b>Viva</b>	<b>Term Work</b>
3	0	2	50	30	20	25	25

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Introduction</b> Basic Understanding of Computer Network and Internet, Transmission Media, Switching Techniques, Network Metrics, OSI Model, TCP/IP Model	9
2	<b>Application Layer</b> Principles of Network applications, Web & HTTP, Domain Name System, Electronic Mail, Socket Programming	8
3	<b>Transport Layer</b> Transport layer Protocols and its services, Multiplexing and Demultiplexing, User Datagram Protocol, Transmission Control Protocol, Principles of Congestion Control.	10

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
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	10
5	<b>Datalink Layer</b> Data Link layer Design Issues, Link layer services, error-detection and correction techniques, Multiple Access Protocols (MAP), Ethernet	8
<b>Total Hours</b>		<b>45</b>

### Suggested List of Experiments:

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Practical 1</b> Study and demonstration of networking commands.	2
2	<b>Practical 2</b> Study of networking devices.	2
3	<b>Practical 3</b> Demonstration of Cisco Packet Tracer by taking two end point devices.	2
4	<b>Practical 4</b> Demonstration of networking devices in packet tracer.	2
5	<b>Practical 5</b> Demonstration of Network Topologies in cisco packet tracer	2
6	<b>Practical 6</b> Implement the concept of static routing.	2
7	<b>Practical 7</b> Implement the concept of dynamic routing	2
8	<b>Practical 8</b> Implement the concept of VLAN using Network Simulator.	2
9	<b>Practical 9</b> Configuration of DHCP Server in Packet Tracer Software and analysis of DHCP messages	2
10	<b>Practical 10</b> Implement the concept of subnetting in Packet tracer and show then ARP protocol activities.	2
11	<b>Practical 11</b> Packet capture and header analysis by wire-shark (TCP, UDP, IP)	2
12	<b>Practical 12</b> Configuration of E-mail Server in Packet Tracer Software.	2
13	<b>Practical 13</b> Preparing straight and cross cables.	2

### Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
14	<b>Practical 14</b> A program in C/C++/JAVA/Python for socket programming and share your file from one system to another.	2
<b>Total Hours</b>		<b>28</b>

### Textbook :

- 1 Computer Networks, Andrew S. Tanenbaum, PHI Publication, 2005

### References:

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

### Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	20.00	30.00	30.00	5.00	5.00

### Instructional Method:

- 1 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.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 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/>

**Supplementary Resources:**

- 3 <http://www.nptelvideos.in/2012/11/computer-networks.html>
- 4 <http://www.networkworld.com/blogs>