Teaching Scheme	Examination Scheme
Lectures–3 Hours/week,3Credits	ESE–70 Marks
Practical–2 Hour/week,1Credits	ISE–30 Marks
	ICA–25 Marks

Introduction:
This course introduces OSI reference model and TCP/IP protocol in detail and ital so covers the IPv4 Addressing, Socket Programming, Transport layer and Application layer protocols.

Course Prerequisite: Student should have the knowledge of Basics of Computer Networks and networking devices.

Course Objectives:
1. To Introduce OSI reference model, TCP/IP protocol and different classes of IPv4 addressing.
2. To analyze client-server paradigm for socket interfaces and Transport layer protocols like TCP, UDP and SCTP.
3. To explore different application layer protocols like DNS,FTP and TELNET.

Course Outcomes:
Student will be able to
1. Understand the basic principles of OSI reference model and TCP/IP protocol suite for Network-communication.
2. Identify the different classes of IP address for network set-up.
3. Implement client-server paradigm using transport layer protocols.
4. Select and use appropriate Application Layer Protocols for a given problem.

SECTION-I

UNIT-1 Basics of Computer Networks (08)
OSI Reference model, TCP/IP protocol, Internet Protocol : Introduction, IP Datagram, fragmentation, Addressing : Physical, Logical, Port & Application Specific Addresses. Introduction To IPv4 Addresses: Classful addressing, Classless addressing, Special addresses,NAT

UNIT-2 Transport Layer (07)
UDP: Introduction, User Datagram, UDP Services, UDP Applications.
TCP: TCP Services, TCP Features, Segment, A TCP Connection, Flow Control, Error Control, Congestion Control,TCP Timers.
SCTP: Introduction, SCTP Services, SCTP Features, Packet Format

UNIT-3 Client Server Model and Socket Interface (08)
Client Server Paradigm: Server, Client, Concurrency, Concurrency in Clients, Concurrency in Servers, Socket, Byte Ordering Functions. Socket System Calls, Connectionless Iterative Server, UDP Client Server Programs, and Connection-oriented Concurrent Server.

UNIT-4 Host Configuration & Domain Name System   (07)

Host Configuration : BOOTP Operation, Packet format, DHCP : Introduction, DHCP Operation and Configuration.

Domain Name System: Need for DNS, Name Space, DNS in the Internet, Resolution, DNS Messages, Types of Records.

UNIT-5Remote Login and TELNET   (07)

TELNET Concept, Time-Sharing Environment, Network Virtual Terminal, Embedding, Options, Symmetry, Suboption Negotiation, Controlling the Server, Out-of-Band Signaling, Escape Character, Mode of Operation, User Interface.

SSH:Components, Port Forwarding, Format of SSH Packets.

UNIT-6 File Transfer and Electronic Mail   (08)

FTP: Introduction**,** control & data connections, Communication over data and control connection, Command Processing

TFTP: Messages, Connection, Data Transfer, UDP Ports, TFTP Applications.

Electronic Mail: Architecture, UserAgent, Message Transfer Agent, SMTP, Message Access Agent: POP and IMAP

Internal Continuous Assessment(ICA):

Students should perform minimum 8 experiments based on the following guidelines and preferably conducted on Unix/Linux platform using C language.

1. Configuration of Network-Assigning IP Address, Subnet-Mask, Default Gateway, DNS Server Addresses & Testing Basic Connectivity.
2. Connectionless Iterative Server : C Implementation of Client-Server Programs Using Iterative UDP Server.
3. Connection-oriented Iterative Server : C Implementation of Client-Server Programs Using Iterative TCP Server.
4. Connection-oriented Concurrent Server : C Implementation of Client-Server Programs Using Concurrent TCP Server.
5. Implementation of Simple Network Chatting Application.
6. Remote Login : TELNET
   a. Logon to a remote computer from client using TELNET.
   b. After logging on executes few commands at remote server from client. For example userwants a server to display a file (hello.txt) on a remote server then he/she types: *cathello.txt*.
   c. Logon to a remote computer from client using TELNET and Putty terminal emulator. After logging on execute few commands. Here Client and Server are on heterogeneous systems, for example client is on windows and server is on Linux.
7. Remote Login : SSH
   a. Log on to a remote computer from client using SSH.
   b. After logging on executes few commands at remote server from client. For exampleuser wants a server to display a file (hello.txt) on a remote server then he/she types:*cathello.txt*.
   c. Log on to a remote computer from client using SSH and Putty terminal emulator.After logging on execute few commands. Here Client and Server are on heterogeneous systems for example client is on windows and server is on Linux.
8. Installation and configuration of DHCP
9. Installation and configuration of FTP.