Program :	**Diploma in Computer Engineering / Diploma in Cloud Computing and Big Data / Cyber Forensics and Information Security**
Course Code : **4132**	Course Title: **Computer Communication and Networks**
Semester : **4**	Credits: **3**
Course Category: **Program Core**	
Periods per week: **3 (L:3 T:0 P:0)**	Periods per semester: **45**

Course Objectives:

- Provide adequate knowledge of the concept of data communication and computer networks.
- Acquire knowledge of data sharing, transmission media and protocols.

Course Prerequisites:

Topic	Course code	Course name	Semester
Number system, Binary arithmetic Error detection and correction		Digital Computer Fundamentals	III

Course Outcomes :

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive level
CO1	Summarize the basic concepts of data communication and computer networks	8	Understanding
CO2	Illustrate physical and data link layer functions and protocols	13	Understanding
CO3	Outline services and protocols of network and transport layers	13	Understanding
CO4	Demonstrate application layer functions and protocols	9	Understanding
	Series Test	2	

CO – PO Mapping

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	2						
CO2	2						
CO3	2						
CO4	2						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Summarize the basic concepts of data communication and computer networks**		
M1.01	Explain the basic concepts of Data communication	2	Understanding
M1.02	Compare types of networks and topology	2	Understanding
M1.03	Explain the layered concept of TCP/IP and OSI models	2	Understanding
M1.04	Compare TCP/IP and OSI models	1	Understanding
M1.05	Summarize protocols in TCP/IP protocol suite	1	Understanding
Contents: **Introduction to data communication** – definition, components, data representations, data flow **Networks** – definition, network criteria, types of connection, physical topology, network types, Internet **TCP/IP and OSI models**- functions of layers in both models, comparison, TCP/IP protocol suite.			
CO2	**Illustrate physical and data link layer functions and protocols**		
M2.01	Describe the concept of physical layer	2	Understanding
M2.02	Outline the features of transmission media	2	Understanding

M2.03	Summarize the basic concepts of data link layer and services	2	Understanding
M2.04	Outline the features and protocols of Data Link Control	3	Understanding
M2.05	Explain features and protocols of Media Access Control	3	Understanding
M2.06	Summarize the features of Ethernet	1	Understanding
	Series Test – I	1	

Contents:

Physical layer – Analog and digital data, Transmission impairment, Transmission modes

Transmission media – Guided media, Unguided media

Datalink layer –Datalink control, DLC services-framing, flow and error control, connectionless and connection oriented

Datalink layer protocols – simple, stop and wait

Media Access Control –Random Access protocols-Aloha, SMA,CSMA/CD,CSMA/CA

Ethernet –IEEE 802 project, Ethernet evolution.

CO3	**Outline services and protocols of network and transport layers**		
M3.01	Summarize network layer services and IP addressing	2	Understanding
M3.02	Explain network layer protocols and functions	3	Understanding
M3.03	Compare routing algorithms	3	Understanding
M3.04	Summarize transport layer services	2	Understanding
M3.05	Compare the features of transport layer protocols	3	Understanding

Contents:

Network layer- Network layer services, IP v4 addresses, subnetting

Network layer protocols – Internet protocol, IPv6 protocol- Packet Format

Routing algorithms- Link state, Distance vector

Transport layer- Transport layer services

Transport layer protocols- UDP-User Datagram, Services, Applications, Features, TCP –Services, Features, Applications, Segment.

CO4	Demonstrate application layer functions and protocols		
M4.01	Summarize the functions of Application layer	1	Understanding
M4.02	Compare client-server and peer to peer paradigms	2	Understanding
M4.03	Describe the features of application layer Protocols	6	Understanding
	Series Test – II	1	

Contents:

Application layer - services **Application layer paradigms**- client-server, peer to peer

Application layer protocols - WWW-architecture, URL, web documents, HTTP-Non persistent v/s Persistent, FTP-basic model, Electronic mail- Architecture, TELNET, DNS-Namespace, DNS in the Internet, Resolution, SSH-components.

Text / Reference

T/R	Book Title/Author
T1	Behrouz A. Forouzan -**Data Communications and Networking** – McGraw Hill Edn. –Fourth Edition/Fifth Edition
R1	Andrew S. Tanenbaum ,David J. Wetherall **Computer Networks** – Prentice Hall fifth Edition
R2	William Stalling - **Data Communication & Networks -** Prentice Hall-Tenth Edition
R3	Fred Halsall -**Data Communications, Computer Networks and Open Systems** - Addison-Wesley, 1996

Online Resources

Sl.No	Website Link
1	https://www.tutorialspoint.com/data_communication_computer_network/
2	https://www.geeksforgeeks.org/computer-network-tutorials/