Course Title: Data Communication	***Course Code: 20CS430***
Credits: 4	***Contact Hours (L: T: P): 52:0:0***
Type of Course: Theory	***Category: Professional Core Course***
CIE Marks: 50	***SEE Marks: 100***

Pre-requisite: Data Structures.

Course Objectives: The course should enable the students to:

Sl. No.	Course Objectives
1	Introduce the basic concepts of data communication
2	Learn and analyse the working of physical, data link and network layers.
3	Learn to solve the problems related to TCP/IP protocols, Line coding, Switching, Error detection and other related protocols.

Unit No.	Course Content	No. of Hours
1	**Introduction:** Data Communications, Networks, Network Types, Standards and Administration, **Networks Models:** Protocol Layering, TCP/IP Protocol suite, The OSI model.	8
2	**Introduction to Physical Layer-1:** Data and Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission:** Digital to Digital Conversion (Only Line coding: Polar, Bipolar and Manchester coding), Analog to Digital conversion (only PCM), Transmission Modes.	10
3	**Bandwidth Utilization:** Multiplexing, **Transmission Media:** Guided Media, Unguided Media **Switching:** Introduction, Circuit Switched Networks and Packet switching, Structure of a Switch.	10
4	**Error Detection and Correction:** Introduction, Block Coding, Cyclic Codes: Cyclic Redundancy Checksum**,** Forward Error Correction: Hamming distance, XOR.	12
5	**Data link Layer: Introduction to Data-Link Layer:** Introduction, Link-Layer Addressing, **Data link Services:** DLC services, Data link layer protocols, Point to Point protocol (Framing, Transition phases only). **Media Access control:** Random Access, Controlled Access and Channelization.	12

Text Books:

Sl. No.	Author/s	Title	Publisher Details
1	Behrouz A. Forouzan	Data Communications and Networking	5th Edition, Tata McGraw-Hill, 2013

Reference Books:

Sl. No	Author/s	Title	Publisher Details
1	William Stallings	Data and Computer Communication	10th Edition, Pearson Education, 2014
2	Alberto Leon-Garcia and Indra Widjaja	Communication Networks - Fundamental Concepts and Key architectures	2nd Edition Tata McGraw-Hill, Reprint 2017
3	Larry L. Peterson and Bruce S. Davie	Computer Networks – A Systems Approach	5th Edition, Elsevier, 2012
4	Nader F. Mir	Computer and Communication Networks	Pearson Education, 2007

Web Resources:

Sl. No.	Web Link
1	https://nptel.ac.in/courses/106105183/
2	https://nptel.ac.in/courses/106/105/106105082/

Course Outcomes:

CO1	Explain the basic concepts of computer networks and different types of network models.
CO2	Discuss various elements of physical layer and different data transmission modes.
CO3	Explain the fundamental concepts of multiplexing, transmission media and switching.
CO4	Apply various error detection and correction methods.
CO5	Illustrate data link layer services and different media access control.

Mapping Course Outcomes with Program outcomes & Program Specific outcomes:

Course Outcomes	Program Outcomes												PSO's			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	P012	PSO1	PSO2	PSO3	PSO4
CO1	3	-		-	-	-	-	-	-	-	-	-	-	3	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	3	3	-	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	3	3	3	-
CO4	3	3	3	1	-	-	-	-	-	-	-	-	3	3	3	-
CO5	3	3	3	-	-	-	-	-	-	-	-	-	-	3	-	-

1-Low association, 2- Moderate association, 3-High association