DATA COMMUNICATION

ourse code: 18IS3DCDCM
: P: T: 3:0:0
xam Hours:03
otal Hours: 40

Credits: 03
CIE Marks: 50
SEE Marks: 50

ourse objectives:

1. Identify the components of a data communication system, factors which impact performance of data communication systems and solve numerical examples related to these.
2. Understand & Analyze Analog to Digital conversions and vice versa, Multiplexing and various types of transmission media used in computer networks and methods to optimize utilization of their capacities.
3. Understand the different types of circuit switched Networks and discuss various error detection and correction techniques employed in data link layer
4. Analyze the various ARQ protocols, frame construction protocols like HDLC, PPP and also the multiple access protocols employed by Data link layer.
5. Understand the structure of 802.3 and 803.11 protocols along with associated headers and algorithms used and also learn about the connecting devices.

ourse Outcomes: At the end of the course, student will be able to:

O1	Inerpret the components of data communication system.
O2	Distinguish different communication models / protocol stacks (OSI & TCP/IP) and solve problems on data transmission by measuring the performanceparameters.
O3	Handle the problems associated with digital data andsignals.
O4	Apply different error detection & correction strategies to solve errors induced during data communication.
O5	Use the different strategies of multiple access and achieve better network efficiency.
O6	Illustrate the architecture and working of different types of network as well as identify the connecting devices to be used for different types of networks.

apping of Course outcomes to Program outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	1	-	-	-	-	-	-	-	-	-	-	-	2
CO2	3	-	1	-	-	-	-	-	-	-	-	1	-	-	3
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	-	3
CO4	3	3	-	-	-	-	-	-	-	-	-	1	-	-	2
CO5	3	3	-	-	-	-	-	-	-	-	-	1	-	-	2
CO6	2	2	-	-	-	-	-	-	-	-	-	-	-	-	3

Unit	Contents of the Unit	Hours	COs
1.	INTRODUCTION Data Communications, Networks, The Internet, Protocols &Standards, Layered Tasks, The OSI model, Layers in OSI model, TCP/IP Protocol suite.	8	CO1 & CO2
2.	Physical Layer-1 Analog & Digital Signals, Transmission Impairment, DataRate limits, Performance, Digital-digital conversion -Only Line coding: Polar, Bipolar and Manchester coding.Analog to digital Conversion:Pulse Code Modulation	8	CO3& CO4
3.	Data Link Layer-1 Error Detection & Correction: Introduction, Block coding, Linear block codes, Cyclic codes, Checksum. Data Link Layer-2 Framing, Flow and Error Control Protocols, Noiseless Channels, Noisy channels	8	CO3 & CO4
4.	Multiple Access & Ethernet Random Access: Carrier Sense Multiple Access(CSMA), Carrier sense multiple access with collision detection(CSMA/CD),Carrier Sense Multiple Access with Collision Avoidance(CSMA/CA), Controlled Access, Channelization: FDMA, TDMA, CDMA Ethernet: IEEE standards, Standard Ethernet, Changes in the standard	8	CO4& CO6
5.	Wireless LANs and Cellular Networks Introduction, IEEE 802.11:Architecture,MAC Sublayer, Addressing Mechanism Bluetooth: Architecture, Bluetooth layers, Radio Layer, Baseband Layer, Connecting devices	8	CO5 & CO6

Self-study component:

Note: 1.Questions for CIE and SEE not to be set from self-study component.

2. Assignment Questions should be from self-study component only.

UNIT 1:Addressing
UNIT 2: Addressing, Analog to digital Conversion:Delta ModulationTransmission Modes, Digital-to-analog conversion, Multiplexing, Spread Spectrum, HDLC, PPP - Framing, Transition phases only.
UNIT 3: Noiseless Channels, Noisy Channels, HDLC.
UNIT 4: Fast Ethernet, Gigabit Ethernet
UNIT 5: Wireless WANS: Satellite Networks, Cellular Telephony

TEXT BOOK:

1. Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, Tata McGraw- Hill, 2006
2.

REFERENCE BOOKS:

1. Alberto Leon-Garcia and IndraWidjaja, Communication Networks –Fundamental Concepts and Key architectures, Second Edition, Tata McGraw-Hill,2004.

2. Wayne Tomasi, Introduction to Data Communications and Networking, Pearson Education, 2005.

Assessment Pattern:

CIE –Continuous Internal Evaluation Theory (50 Marks)

Bloom's Category	Tests	Assignments	AAT1	AAT2
Marks (Out of 50)	30	10	05	05
Remember	10			01
Understand	10	05	01	01
Apply	10	05	02	01
Analyze			02	
Evaluate				
Create				02

*AAT 1– Alternate Assessment Tool 1: Quiz
AAT 2 - Alternate Assessment Tool 2: case study

SEE –Semester End Examination Theory (50 Marks)

Bloom's Category	Marks Theory(50)
Remember	05
Understand	10
Apply	10
Analyze	10
Evaluate	10
Create	05