

Course Name : Electronics Engineering Group

Course Code : IF/ IE/ IU

Semester : Sixth FOR IF / IE SEVENTH FOR IU

Subject Title : Data Communication and Networking (Elective-I for IE/IU)

Subject Code : 9170

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
03	--	02	03	80	20	--	25@	--	125

Rationale:

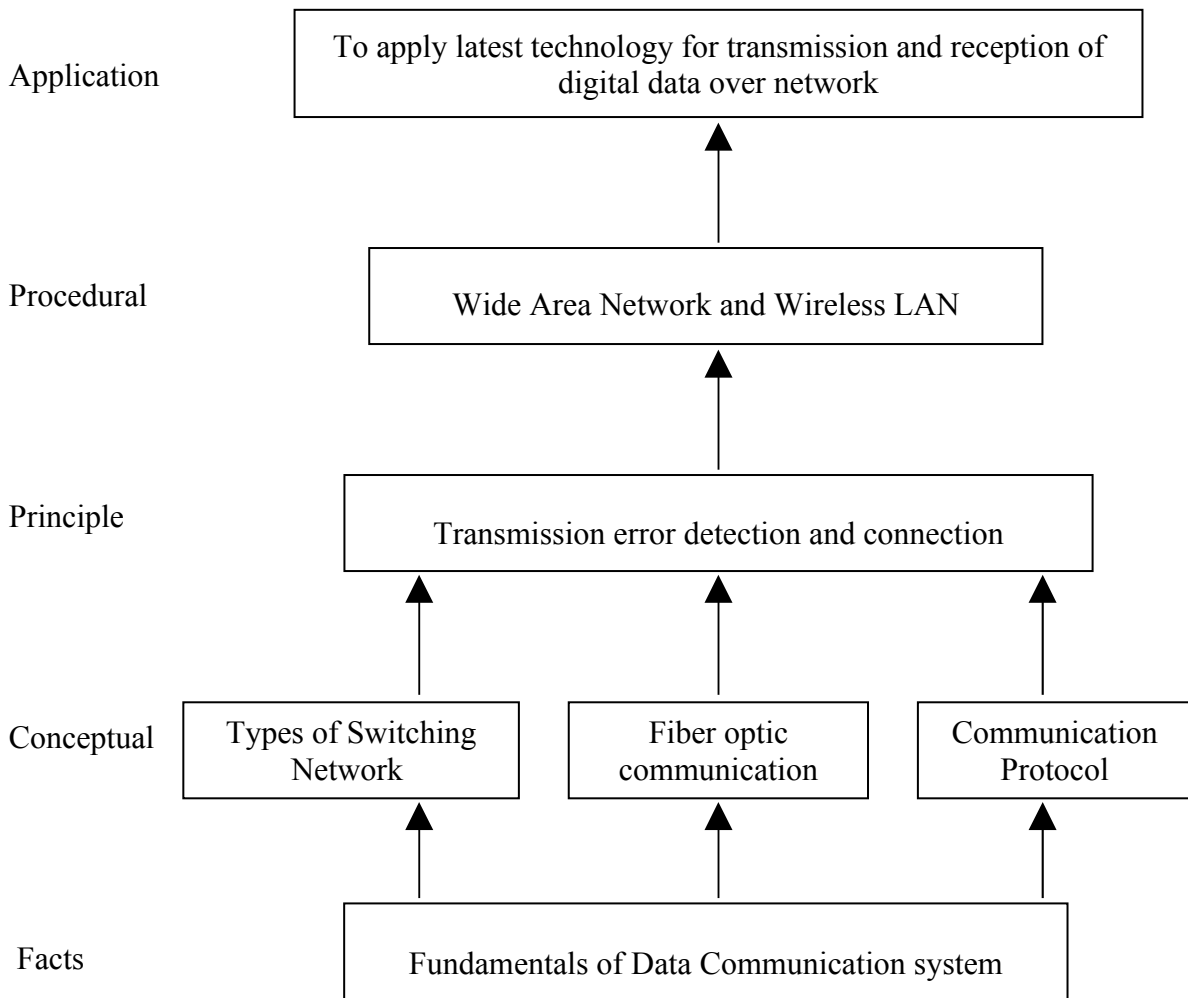
After understanding basic communication system it is worth to discuss Data Communication & Networking. Telecommunication & Data communication is fastest growing technology & undoubtedly has strong growth in future so we should know data transfer from one system to another system through different communication networks like WAN, MAN & different switching techniques.

Objective:

The student will be able to:

1. Distinguish between different terms used for digital data communication
2. Describe the working of different switching techniques.
3. Identify the error & suggest corrective techniques.
4. Describe Wireless LAN Technology.
5. Describe fiber optic communication techniques.
6. Compare different distributed application system.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Concept of Data Communication & Networking 1.1 Data Communication – Protocols; Standards; Standards Organizations; 1.2 Signal Propagation - Analog & Digital Signals; Bandwidth of signal & a medium; Data transmission rate and the bandwidth.	06	12
02	WAN 2.1 Switching Basics - Circuit Switching; Packet Switching - Datagram approach, Virtual circuit approach; Message Switching 2.2 Frame Relay - Introduction; The need for Frame Relay; How Frame Relay works; Frame Relay frame format 2.3 Asynchronous Transfer Mode (ATM) – Introduction, Overview of ATM, Packet Size, ATM Cells, Switching, ATM layers.	12	16
03	Fiber Optic Communication 3.1 Light Propagation - Basic Concepts, Reflection & Refraction, light into the cable; 3.2 Fiber Cables – Construction, Propagation effect, Fiber optic cable modes, Refractive indexes in fiber cores; 3.3 Light Sources – Light emitting diodes, lasers; 3.4 Optical detections 3.5 Fiber Cable Losses - Connector and cable misalignment, Effects of bends in the cable, Absorption losses & scattering.	10	16
04	Transmission Errors-Detection & Correction 4.1 Error classification – Delay distortion, Attenuation, Noise; Types of Errors. 4.2 Error detection - Vertical redundancy check; longitudinal redundancy check; Cyclic redundancy check. 4.3 Recovery from errors – Stop & Wait, Go-back-in, Sliding Windows	04	08
05	Distributed Application 5.1 Application - Simple Network Management Protocol (SNMP); Simple Mail Transfer Protocol (SMTP); Multipurpose Internet Mail Extension (MIME); Hyper Text Transfer Protocol (HTTP); File Transfer Protocol (FTP) Uniform Resource Locator (URL)	08	16
06	Wireless LAN 6.1 IEEE 802.11 - Architecture- BSS, ESS; Physical layer – FHSS, DSSS, OFDM; MAC layer – DCF, PCF 6.2 Bluetooth – Architecture; Bluetooth layers – Media layer,	08	12

	base band layer, physical links, L2 CAP.		
		Total	48
			80

List of Practical:

1. Measurement of NA of given optical fiber.
2. Radiation pattern of LED / Laser.
3. Study of Optical detector characteristics.
4. Measurement of fiber losses.
5. Study of switching in data Networks.
6. Study of Frame relay & ATM.
7. Study of error detection & recovery.
8. Study of FHSS, DSSS.
9. Study of Bluetooth Technology.

Learning Resources:

Books:

Sr. No.	Author	Title	Publication
01	Achyut S. Godbole	Data Communication & Networking	Tata McGraw-Hill Edition
02	B.A. Forouzan	Data Communication & Networking	Tata McGraw-Hill Edition (4 th Edition)
03	Michal Miller	Data & Network Communication	Thomson Delmar Learning