

DATA COMMUNICATION AND NETWORKING

SUBJECT CODE: IT 303

Teaching Scheme (Credits and Hours)

Teaching scheme				Total Credit	Evaluation Scheme					Total
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	02	05	04	03	70	30	20	30	150

Learning Objectives

The educational objectives of this course are

- To Focus on information sharing and networks.
- To Introduce flow of data, categories of network, different topologies.
- To Focus on different coding schemes.
- Brief the students regarding protocols and standards.
- To give clear idea of signals, transmission media, errors in data communications and their correction, networks classes and devices,etc.

Outline of the Course

Sr. No	Title of the Unit	Minimum Hours
1	Introduction to data communication and networking	04
2	Study of OSI and TCP/IP protocol suit	04
3	Study of Analog and Digital signals	05
4	Study of Digital transmission	05
5	Study of Analog transmission	05
6	Study of Multiplexing	05
7	Types of transmission media	04
8	Error Detection and Correction	05
9	Study of DTE-DCE in brief	04
10	Introduction to networks and devices	04

Total hours (Theory): 45

Total hours (Lab): 30

Total hours: 75

Detailed Syllabus

Unit No	Topics	Lecture (Hours)	Weight age (%)
1.	Introduction to data communication and networking: Why study data communication?, Data Communication, Networks, Protocols and Standards, Standards Organizations. Line Configuration, Topology, Transmission Modes, Categories of Networks Internet works	04	8
2.	Study of OSI and TCP/IP protocol suit: The Model, Functions of the layers, TCP/IP Protocol Suites	04	11
3.	Study of Signals: Analog and Digital, Periodic and Aperiodic Signals, Analog Signals, Time and Frequency Domains, Composite Signals, Digital Signals	05	10
4.	Study of Digital transmission: Digital to Digital Conversion, Analog to Digital Conversion	05	12
5.	Study of Analog transmission: Digital to Analog Conversion, Analog to Analog Conversion	05	12
6.	Study of Multiplexing: Many to one/one to Many, Frequency division Multiplexing, Wave division Multiplexing, Time division Multiplexing, Multiplexing applications	05	11
7.	Types of transmission media: Guided Media, Unguided Media, Transmission Impairments, Performance Wavelength, Shannon Capacity, Media Comparison, PSTN, Switching	04	8
8.	Error Detection and Correction: Types of Errors, Detection, Parity Check, Vertical Redundancy Check Longitudinal Redundancy Check, Cyclic Redundancy Check, Checksum, Error Correction	05	12
9.	Study of DTE-DCE in brief: Digital data transmission, DTE-DCE Interface, Modems, 56K Modems, Cable Modems	04	8
10.	Introduction to networks and devices: Network classes, Repeaters, Hub, Bridges, Switches, Routers, Gateways Brouters Routing Algorithms, Distance Vector Routing, Link State Routing	04	8
	Total	45	100

Instructional method and Pedagogy

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.

- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Learning Outcome

- On successful completion of the course, the student will be having the basic knowledge of data sharing, transmission media and their protocols.
- Student will have the basic knowledge of computer networks.

Text Books:

1. Data communication & Networking by Bahrouz Forouzan.
2. Computer Networks by Andrew S. Tanenbaum

Reference Books:

1. Data and Computer Communications by William Stallings

List Of Practicals:

Sr No.	List of Practicals
1	Study of Network Components.
2	Study of Analog and Digital Signals.
3	Study of Network Topologies.
4	To connect two pc's using peer to peer communication.
5	Implementation of small network using hub and switch.
6	To study Error Detection methods.
7	To study Error Correction methods.
8	To study the different line coding schemes.
9	Basic study of Network classes.
10	Study of DTE-DCE.
11	Study of Networks.
12	Overview of Boson Simulator.