

0903 –DIPLOMA IN ELECTRONICS & COMMUNICATION
SEMESTER -6
090363- DIGITAL AND DATA COMMUNICATION

RATIONALE

This course deals with the advanced digital and data communication techniques. It involves the use of modems in synchronous and asynchronous data transmission. It encompasses the modern communication network and integrated services like ISDN and radio paging along with cellular mobile telephones, FAX, electronic exchanges etc. The students should understand the advantages and limitations of various analog and digital modulation systems on a comparative scale and relate to them while studying practical communication systems.

DETAILED CONTENTS

1. Introduction

Basic block diagram of digital and data communication systems, Their comparison with analog communication system. Synchronous and Asynchronous communication system.

2. Digital Communication

Basic scheme of PCM system, quantization, quantization error companding, block diagram of TDM-PCM communication system and function of each block Advantages of PCM system, concept of differential PCM (DPCM) system

3. Data Communication Hardware

UART, USART, their need in communication. Need and function of modems. Mode of modems operation (low speed, medium speed and high speed modems). Modem interconnection, Modem data transmission speed. Modem modulation methods, Modem interfacing (RS 232 interface other interfaces)

4. Network and Control Considerations

Protocols and their functions
Data communication network organisation. Basic idea of various modes of digital switching Circuit switching, message switching, packet switching.
a) Basic concept of integrated services.
b) Digital Network (ISDN) its need in modern communication, brief idea of ISDN interfaces
c) Basic idea of local area Network (LAN), and its various topologies, LAN interconnection, Eathernet
d) Introduction to EPABX

5. Mobile Communication

Operation of Cellular mobile telephone system. cells and frequency reuse, cell spitting, cell sectoring, interference, handover, concept of first generation analog, second generation TDMA (GSM) and CDMA cellular system. Introduction to personal communication system (PCS). Introduction

to WLL, Introduction to G₁, G₂, G₃ mobile communication

6. Facsimile (FAX)

Basic idea of FAX system and its applications; Principle of operation and block diagram of modern FAX system. Important features of modern FAX machines.

LIST OF PRACTICALS

1. Observe wave forms at pulse code modulation and demodulation
2. To study the construction and working of a telephone handset.
3. To study the construction and working of a FAX machine.
4. To study the features and working of an EPABX.
5. To study the working & features of a cellular mobile system and pagers.
6. To study the working of a LAN system.

NOTE

Visits to the sites of all types of telephone exchanges including mobile and rural exchanges be made with a view to understand their working. A comprehensive report must be prepared by all the students on these visits, especially indicating the dates and locations of their visits.

RECOMMENDED BOOKS

1. Communication by W.Stalling, Pearson Publishers
2. Electronics Communication System by KS Jamwal, Dhanpat Rai & Co., New Delhi
3. Computer Network by Tenenbaun Andrews, Prentice Hall of India, New Delhi
4. Data Communication and Networking by Foronzan TMH, New Delhi