

## **EC-501 Voice and Data Communication**

### **Unit I**

#### **Telephone instruments and signals**

Introduction, the subscriber loop, standard telephone set, basic call procedure, call progress tones and signals, cordless telephones, caller identification, electronic telephones.

#### **Telephone circuit**

Introduction, the local subscriber loop, channel noise and units of power measurements, transmission parameters, voice frequency circuit arrangements, crosstalk.

### **Unit II**

#### **Public telephone network**

Introduction, transmission system environment, public telephone network, instruments, local loops, trunk circuits, - local central and operator-assisted exchanges, automated central office switches and exchanges, telephone numbering plan, telephone services, telephone switching hierarchy, common channel signaling system.

#### **Multiplexing of telephone channels**

Introduction, time division multiplexing, T1 digital carrier, digital hierarchy, digital carrier line encoding, T carrier systems, digital carrier frame synchronization, bit versus word interleaving, statistical TDM, codecs and combo chips, frequency division multiplexing, FDM hierarchy, composite baseband signal, formation of master group, wavelength division multiplexing.

### **Unit III**

#### **Multiplexing of telephone channels**

Introduction, time division multiplexing, T1 digital carrier, digital hierarchy, digital carrier line encoding, T carrier systems, digital carrier frame synchronization, bit versus word interleaving, statistical TDM, codecs and combo chips, frequency division multiplexing, FDM hierarchy, composite baseband signal, formation of mastergroup, wavelength division multiplexing.

### **Unit IV**

#### **Data Communications**

Components, protocols and standards, standards organizations, line configuration, topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media- guided and unguided, transmission impairment, performance, wavelength and Shannon capacity.

### **Unit V**

#### **Error detection and correction**

Types of error, error detection- redundancy check (longitudinal, vertical and cyclic), checksum, error correction-hamming code.

#### **Switching**

Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and datagram approach), message switching.

#### **References:**

1. Tomasi: Advanced Electronic Communication Systems, PHI Learning.
2. Forouzan: Data Communications and Networking, TMH.
3. Tomasi: Introduction to Data Communication Systems, Pearson Education.
4. William Stallings: Data and Computer Communications, Pearson Education
5. Brijendra Singh: Data Communications and Networks, PHI Learning.