

**Hemchandracharya North Gujarat University, Patan**  
**B.E. SEMESTER – IV (IT)**

**IT403: DATA COMMUNICATION AND NETWORKING**

**Teaching Scheme**

Theory 4 hrs/week  
Tutorial -  
Practical 02 hrs/week  
Total 06 hrs/week

**Examination Scheme**

Theory 100 Marks  
Practical 25 Marks  
Term Work 25 Marks  
Total 150 Marks

1. **INTRODUCTION**  
Why study data communication? Data Communication, Networks, Protocols and Standards, Standards Organizations
2. **BASIC CONCEPTS**  
Line Configuration, Topology, Transmission Modes, Categories of Networks Internet works
3. **THE OSI MODEL**  
The Model, Functions of the layers, TCP/IP Protocol Suites
4. **SIGNALS**  
Analog and Digital, Periodic and Aperiodic Signals, Analog Signals, Time and Frequency Domains, Composite Signals, Digital Signals
5. **ENCODING AND MODULATION**  
Digital to Digital Conversion, Analog to Digital Conversion, Digital to Analog Conversion, Analog to Analog Conversion
6. **TRANSMISSION OF DIGITAL DATA**  
Digital data transmission, DTE-DCE Interface, Modems, 56K Modems, Cable Modems
7. **TRANSMISSION MEDIA**  
Guided Media, Unguided Media, Transmission Impairments, Performance Wavelength, Shannon Capacity , Media Comparison, PSTN , Switching
8. **MULTIPLEXING**  
Many to one/one to Many, Frequency division Multiplexing, Wage division Multiplexing, Time division Multiplexing, Multiplexing applications
9. **ERROR CORRECTION AND DETECTION**  
Types of Errors, Detection, Parity Check, Vertical Redundancy Check Longitudinal Redundancy Check, Cyclic Redundancy Check, Checksum, Error Correction
10. **LOCAL AREA NETWORKS**  
802, Ethernet, Other Ethernet Networks, Token Bus, Token Ring FDDI
11. **NETWORKING AND INTERNETWORKING DEVICES**  
Repeaters, Hub, Bridges, Switches, Routers, Gateways Brouters, Routing Algorithms, Distance Vector Routing, Link State Routing
12. **UPPER OSI LAYERS**  
Duties of Transport Layer, Duties of Session Layer, Duties of Presentation Layer, Duties of Application Layer

**Reference Books:**

1. Data communication & Networking by Bahrouz Forouzan.
2. Data and Computer Communications by William Stallings
3. Computer Networks by Andrew S. Tanenbaum
4. Introduction to Data Communications and Networking by Wayne Tomasi