B. Tech. IV (EC) Semester VIII	L	T	P	C
EC 404: COMPUTER & COMMUNICATION NETWORKS	**4**	**0**	**2**	**5**

- **DATA COMMUNICATIONS AND NETWORKING OVERVIEW** **(03 Hours)**
  A Communications Model, Data Communications, Data Communication Networking, An Example Configuration
- **PROTOCOL ARCHITECTURE** **(03 Hours)**
  The Need For A Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP / IP Protocol Architecture
- **DIGITAL DATA COMMUNICATION TECHNIQUES** **(04 Hours)**
  Asynchronous And Synchronous Transmission, Types Of Errors, Error Detection, Error Correction, Line Configuration, Interfacing
- **DATA LINK CONTROL** **(03 Hours)**
  Flow Control, Error Control, High-Level Data Link Control, Performance Issues
- **ROUTING IN SWITCHED NETWORKS** **(03 Hours)**
  Routing In Circuit-Switching Networks, Routing In Packet-Switching Networks, Least-Cost Algorithms
- **CONGESTION CONTROL IN SWITCHED DATA NETWORKS** **(03 Hours)**
  Effects Of Congestion, Congestion Control, Congestion Control In Packet-Switching Networks
- **LOCAL AREA NETWORK OVERVIEW** **(04 Hours)**
  Background, Topologies And Transmission Media, LAN Protocol Architecture, Bridges
- **HIGH-SPEED LANs** **(05 Hours)**
  The Emergence Of High-Speed LANs, Ethernet, Token Ring
- **WIRELESS LANs** **(04 Hours)**
  Overview, Wireless LAN Technology
- **INTERNETWORK PROTOCOLS** **(05 Hours)**
  Basic Protocol Functions, Principles Of Internetworking, Connectionless Internetworking, Internet Protocol, IPv6
- **INTERNETWORK OPERATION** **(02 Hours)**
  Multicasting
- **TRANSPORT PROTOCOLS** **(02 Hours)**
  Transmission Control Protocol, User Datagram Protocol
- **NETWORK SECURITY** **(02 Hours)**
  Security Requirements And Attacks, Confidentiality With Symmetric Encryption, Message Authentication And Hash Functions, Public-Key Encryption And Digital Signatures
- **DISTRIBUTED APPLICATIONS** **(02 Hours)**
  Electronic Mail – SMTP And MIME, Hypertext Transfer Protocol, Network Management - SNMP

(Total Contact Time: 45 Hours)

PRACTICALS:

1. **Cyclic Redundancy Check (CRC) Method for Error Detection**
2. **PC to PC Serial Link Using Com Port**
3. **Hamming Code for Error Detection and Correction**
4. **Packet Transmission**
5. **Bit Stuffing**
6. **Sliding Window Protocol**
7. **Short Path Algorithm**
8. **Stop & Wait Protocol**
9. **Cipher**
10. **Token Ring Implementation**

BOOKS RECOMMENDED:

1. **Tanenbaun Andrew S. ,** *"Computer Networks"*, Prentice Hall Of India, 3rd Ed., 1998
2. **Stallings William,** *"Data And Computer Communications"*, Prentice Hall Of India, 6th Ed., 2000
3. **Forouzen Behrouz A.**, *"Data Communications And Networking",* Tata McGraw-Hill, 2nd Ed., 2000
4. **Gallager R. G. and Bertsekas D., "***Data Networks"*, Prentice Hall of India, 1st Ed., 1992
5. **Garcia Leon and Widjaja I.**, *"Communication Networks"*, Tata McGraw-Hill, 1st Ed., 2000