II BCA – III SEMESTER – COMPUTER NETWORKS AND CYBER SECURITY

UNIT I

Networks: Introduction – Network Hardware – Software - Reference Models – Internet - ATM. **Physical layer:** Transmission Media - Wireless Transmission – Switching Methods: Circuit switching - Packet switching - Hybrid switching – Communication Satellites.

UNIT II

Data link layer Design: Issues – Error Detection and Correction – Elementary Data Link Protocols – Sliding Window Protocols – Data Link Layer in the Internet. Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – Ethernet Wireless LANs – Bluetooth - **Network Layer:** Design Issues – Routing Algorithms – Congestion Control Algorithms – Internet Working – IP Protocol - IP Address – Internet Control Protocol.

UNIT III

Transport layer: Transport Services – Elements of Transport Protocols - TCP protocols – UDP protocols. **Application Layer:** HTTP protocol – SMTP protocol – DHCP protocol – DNS protocol – SNMP protocol – FTP protocol – TFTP protocol.

UNIT IV

Network Security: Message Authentication code (MAC), HMAC, NIST. **Digital Signature:** Digital Signature Algorithm - Elliptic Curve Digital Signature Algorithm - RSA-PSS Digital Signature Algorithm. **Authentication Systems:** Password Based Authentication – Address Based Authentication – Cryptographic Authentication Protocols – K.D.C. – C.A. – Session Key Authentication - Domain Name system (DNS) - Simple Network Management Protocol (SNMP) – Electronic Mail – World Wide Web.

UNIT V

Secure Electronic Transaction (SET): SET Functionalities - Dual Signature - Roles & Operations - Purchase Request Generation - Purchase Request Validation - Payment Authorization and Payment Capture. **Firewalls:** Firewall Characteristics - Types - Firewall Basing - Firewall Location and Configurations. **Electronic Mail Security:** Privacy - S/MIME, DNSSEC, and Domain Keys Identified Mail.

REFERENCE BOOKS:

1. Computer Networks - A.S. TANENBAUM, DAVID J. WETHERALL - PEARSON Publications.