Database Management Systems (DBMS)

Unit	Course Topics	Hours
1	**Introduction to Computer Networks:** Types of networks (LAN, WAN, MAN, PAN), network hardware, OSI model, TCP/IP model, protocols & services	**4L**
2	**Physical Layer:** Transmission media (guided/unguided), signals, bandwidth, multiplexing (FDM, TDM), switching techniques, encoding methods	**6L**
3	**Data Link Layer:** Framing, error detection & correction (Parity, CRC, Hamming), flow control, MAC sublayer, LAN technologies, Ethernet, CSMA/CD, CSMA/CA	**6L**
4	**Network Layer:** IPv4 & IPv6 addressing, subnetting, routing algorithms (distance vector, link state), ARP, ICMP, packet switching, NAT	**6L**
5	**Transport Layer:** TCP vs UDP, flow control, congestion control, reliability, 3-way handshake, ports & sockets	**5L**
6	**Application Layer:** HTTP/HTTPS, DNS, FTP, SMTP, DHCP, Telnet, SNMP, client-server architecture	**4L**
7	**Network Security & Emerging Technologies:** Firewalls, VPN, encryption basics, wireless networking (Wi-Fi, Bluetooth), cloud networking, IoT networking	**4L**