RAMAKRISHNA MISSION VIDYAMANDIRA

CBCS Syllabus B.Sc. Computer Science Honours

Semester-IV

Course Code: CMSA CC 10 Credit: 6
Course Type: Core Course

Course Outcome:

i) Analyze the concepts of networks, types and architectures and identify error free transmission of data and analyze data collision with various protocols.
ii) Illustrate the real time applications of networks.
iii) Able to use common programming interfaces for network communication.
iv) Learn the basics of static and dynamic website development.
v) Acquire knowledge of UNIX/LINUX OS to build client-server applications.

CMSA CC 10 T: Data Communication, Networking and Internet Technology

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Credit: 4   **Marks: 50**

Introduction to Computer Networks: Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite. [4 L]

Data Communication Fundamentals and Techniques: Analog and digital signal; Digital Transmission: Line Coding (NRZ, NRZ-L,NRZ-I, RZ, Manchester, Differential Manchester); Block Coding (Basic Idea); Code Modulation (PCM, DM), Concepts of ADSL Modem; Analog Transmission: Shift Keying (ASK, FSK, PSK, QPSK, QAM); Multiplexing techniques: FDM, TDM, WDM; Transmission media: Transmission Spectrum, Guided (Twisted Pair, Coaxial, Optical Fiber) and Unguided (Radio Wave, Microwave, Infrared, and Satellite Communication: Geostationary, Low Orbit and VSAT); Data rate limitations: Nyquist Theorem and Shannon Capacity. [15 L]

Networks Switching Techniques and Access mechanisms: Circuit switching; packet switching- connectionless datagram switching, connection-oriented virtual circuit switching. [4 L]

Data Link Layer Functions and Protocol: Error detection and error correction techniques; data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet. [10 L]

Multiple Access Protocol and Networks: CSMA/CD protocols; Ethernet LAN; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways. [5 L]

Networks Layer Functions and Protocols: Logical Addressing, IPv4 (Classless and Classful), CIDR, NAT, IPv6 (Basic Idea), Basic idea of Routing. [6 L]

Transport Layer Functions and Protocols: Transport services- error and flow control fundamentals, Connection establishment and release- three way handshake. [6 L]

Internet Technologies: Distributed and Client-Server Computing; Servers.
World Wide Web: Concepts, URL, Browser, Web Documents (Static and Dynamic, Active and Inactive); Domain Name Server (DNS): Level, Domains, Generic and Country wise domain; E-Mail: Architecture, User Agent, Case Studies: SMTP, POP3, IMAP4, MIME; Web Based Mail. Other application layer protocols: TELNET, SSH, FTP, HTTP. [10 L]

CMSA CC 10 P: Network Programming and Web Development Laboratory

Credit: 2   **Marks: 25**

Web Development: Static and dynamic webpage development using HTML, CSS, JavaScript, and PHP: Introduction, Handling forms, methods, events and loops, functions. [20 L]

Network programming: Fundamental ideas on client-server programming using socket and their implementation. [20 L]

Recommended Books:

1. Data Communications and Networking by Behrourz A. Forouzan, 4th Edition; TMH.
2. Data and Computer Communication by William Stallings, 6th Edition; Pearson.
3. Computer Networks by Tanenbaum; Pearson.
4. HTML5 Black Book by DT Editorial Service, Dreamtech Press.
5. Web Technologies Black Book by DT Editorial Service, Dreamtech Press.
6. PHP The Complete Reference by Steven Holzner; McGraw-Hill.