Proposed Courses and Outlines to Add in CSE Curriculum

CSE 310 Data Communication (3.0 credits)

Introduction: Communication model, data communication tasks, data communication network standards and organizations. Protocol architecture, communications between layers, peer to peer communication between remote layers, service access points, service primitives and communication between adjacent layers, encapsulation of PDUs, addition of headers on transmission; removal on reception, segmentation & reassembly by protocol layers, introduction to TCP/IP model and OSI models. Definition of a communications network, types of network, understanding of operation and examples of use-point-to-point connections, circuit-switched networks, message-switched networks, packet-switched networks. types of equipment-end systems, intermediate systems (IS), types of communication - client and server communication, broadcast, unicast and multicast modes, types of packet-switched network-wide area networks (WANs), Internet service providers (ISPs), local area networks (LANs). 2. Physical Layer: Signal: Analog and digital data transmission, spectrum and bandwidth, transmission impairments, data rate and channel capacity. Transmission Medium: Characteristics and applications of various types of guided medium. Wireless Transmission: Characteristics and applications of wireless transmission-terrestrial and satellite microwave, radio waves, propagation mechanism, free space propagation, land propagation, path loss, slow fading, fast fading, delay spread, inter symbol interference, VSAT. Digital transmission: Line coding techniques-NRZ, RZ, Manchester, and differential Manchester encoding, AMI, Block coding, analog to digital conversion based on PCM, delta modulation, etc. Analog transmission: ASK, FSK, PSK, QPSK, QAM encodings, AM, PM, FM, etc. Data Transmission: Synchronous and asynchronous data transmission techniques, interfacing and V.24BIA-232-F, Multiplexing: FDM, international FDM carrier standards, synchronous TDM, international TDM carrier standards, statistical time division multiplexing. Spread Spectrum: Frequency hopping spread spectrum, direct sequence spread spectrum, code division multiple access. High speed digital access: DSL, SONET, SDH, etc. 3. Data Link Layer: Error Detection and Correction; parity check, CRC, forward error correction technique, linear block code, hamming code, etc. Data Link Control: Line configurations, flow control and error control techniques- sliding window, stop and wait ARQ, selective reject ARQ and HDLC protocols. Local Area Network: Topologies and transmission media, LAN protocol architecture, bridges, repeaters, hub, switches, routers, Ethernet, Token ring, Fiber channel, Introduction to wireless LAN. 4. Data Communication

and Network: Circuit switching network, packet switching network, comparison of circuit and packet switching, X.25 etc., Introduction to telecommunication structure of public telephone system and its operation simplex, duplex, half duplex, full-duplex communication, etc.

Books Recommended:

1. Haykin, Communication Systems.

2. Behrouz A. Forouzan, Data Communications and Networking

3. William Stallings, Data and Computer Communications.

CSE 310L Data Communication (1.5credits):

The lab work based on the Data Communication course

CSE445: Software Engineering (3.0credits):

The Product and the Process: the Product, the Process. Managing Software Projects: Project Management Concepts , Software Process and Project Metrics, Software Project Planning, Risk Analysis and Management, Project Scheduling and Tracking, Software Quality Assurance, Software Configuration Management. Conventional Methods for Software Engineering: System Engineering, Analysis Concepts and Principles, Analysis Modeling, Design Concepts and Principles, Architectural Design, User Interface Design, Component-Level Design, Software Testing Techniques ,Software Testing Strategies,Technical Metrics for Software. Object Oriented Software Engineering: Object- Oriented Concepts and Principles, Object-Oriented Analysis, Object-Oriented Design ,Object-Oriented Testing, Technical Metrics for Object-Oriented Systems. Advanced Topics in Software Engineering: Formal Methods, Cleanroom Software Engineering, Component-Based Software Engineering, Client/Server Software Engineering, Web Engineering, Reengineering, Computer-Aided Software Engineering.

TextBooks:

1.FrederickP.Brooks,Jr.,TheMythicalManMonth.Addison-Wesley,1972.

2.Sommerville,Ian,SoftwareEngineering,FifthEdition.Addison-Wesley,1996.

3.Pfleeger,ShariLawrence,SoftwareEngineeringTheoryandPractice,secondedition.Prentice-

Hall2001.

CSE445L Software Engineering Lab (1.5credits):

The lab work based on the Software Engineering course