COMP 4320, Introduction to Computer Networks

Credit hours: 3 lecture
Contact hours: 3 lecture

Catalog Description: Fundamentals of computer networks, OSI model, LAN, WAN, packet transmission, interworking, Internet Protocol, WWW and Java technology.

Prerequisites: COMP 3500 or COMP 3510
Corequisites: None

Required Course (CSCI, SWEN, WIRS)

Instructor or Course Coordinator: Dr. Alvin Lim

Required Textbook
Andrew Tanenbaum and David Weatherall, Computer Networks, 2011

Course Outcomes
The student will be able to
- understand fundamental concepts and principles of computer communication networks.
- understand computer networks from the perspective of the TCP/IP Internet framework.
- gain hands-on experience in UNIX network programming.

Topics Covered
- Introduction to computer networks (1 hour).
- Network applications, services, transport (1 hour)
- Circuit and packet switching, virtual circuits and datagrams, FDM, TDM (3 hours)
- Layered network architectures, ISO OSI reference model, IP protocol suite and comparison with OSI model, BISDN and ATM internetworking (2 hours)
- Network programming (2 hour)
- Physical layer, framing, bit stuffing (2 hours)
- DLL issues (1 hour)
- Simple error detection and correction (1 hour)
- Hamming code and CRC (2 hours)
- ARQ (1 hour)
- Stop and wait protocols (1 hour)
- Alternating bit protocol (1 hour)
- GoBackN (2 hours)
- Selective repeat (1 hour)
- HDLC (1 hour)
- Medium Access Control (1 hour)
- Slotted ALOHA (1 hour)
- Unslotted ALOHA (1 hour)
- CSMA-CD (1 hour)
• Ethernet (1 hour)
• Token Ring (RAT, RAR), Token Bus (3 hours)
• Wireless MAC issues (1 hour)
• Wireless LAN (1 hour)
• Bluetooth (1 hour)
• FDDI (1 hour)
• Introduction to the network layer, virtual circuit vs. datagram routing (1 hour)
• Routing algorithms (1 hour)
• Optimality principle, shortest path algorithms (3 hours)
• Introduction to congestion control (1 hour)
• End-to-end window protocol (1 hour)
• End-to-end flow control (1 hour)
• Domain name server (1 hour)
• Exams (2 hours).

Course Requirements
• Homework assignments (40%)
• Final Exam (60%)

Syllabus prepared: Spring 2016