EE-4272
Computer Networks

Curricular Designation:  CpE: elective,  EE: elective

Catalog Description:
Computer Networks focuses on the fundamental network architecture concepts and their core principles and issues in the emerging Communication/Data Networks. Credits: 3.0 Lec-Rec-Lab: (0-3-0) Semesters Offered: Fall  Prerequisites: EE 2150 and (MA 3710 or MA 3720). Restrictions: Must be enrolled in one of the following Class(es): Junior/Senior

Textbooks(s) and/or Other Required Materials:

Prerequisites by Topic:
1. Introduction to elementary probability, communication theory
2. Familiarity with high-level-language computer programming, including Java/C/C++

Course Objectives:
1. Introduction to the design issues and principles of the computer and data networks.
2. Familiarity with various network architectures and key protocols.
3. Exposure to network design alternatives.
4. Introduction to the challenging issues in the growing Internet.
5. Gain hands-on experience with programming and simulation techniques for network protocols and performance issues

Topics Covered:
1. Introduction: Requirements of Building a Network; Network Architectures; Implementing Network Software.
2. Direct Link Networks: Fundamental of Digital Transmission, Encoding, Framing, Error Detection, Reliable Transmission, Ethernet, Token Ring, SONET.
4. Circuit Switching: Space-Division Switching, Time-Division Switching, Routing in Circuit Switch Networks, Control Signaling.

5. Packet Switching: Switching/Forwarding, Bridges & LAN Switches, ATM, Switching Hardware.

6. Internetworking: IP, Routing, Global Internet, Multicast.

7. End-to-End Protocol: UDP, TCP.

8. Congestion Control & Resource Allocation: Queuing Disciplines, TCP Congestion Control, QoS.

9. Term project/paper

**Relationship of Course to Program Outcomes** (See UPAC SOP, Tables 1 and 2):

- **EE:**
  - Outcome: a via topic(s): all
  - Outcome: e via topic(s): all
  - Outcome: g via topic(s): all
  - Outcome: k via topic(s): 9
  - Outcome: l via topic(s): 9

- **CpE:**
  - Outcome: a via topic(s): all
  - Outcome: e via topic(s): all
  - Outcome: g via topic(s): all
  - Outcome: k via topic(s): 9
  - Outcome: q via topic(s): 9

**Contribution of Course to Meeting the Professional Component:**

- **EE:** Engineering Topics
- **CpE:** Engineering Topics

**Class/Laboratory Schedule** (note: 1 hour = 50 minutes):

- Lecture: 3 hours/week for 15 weeks

**Prepared by:**

Chunxiao (Tricia) Chigan, Assistant Professor, October 29, 2004