Cnt 4104 - Introduction to Data Communications
Fall 2010

Course Description:
To develop an understanding of the various aspects of data communications and computer networking systems. Topics include: data transmission, multiplexing, switching, protocols and architecture, internetworking and ISDN.

Textbook:

Reference:

Instructor: Dr. Sam Hsu, S&E 404; Tel: 561/297-3728; Fax: 561/297-2800
Email: sam@cse.fau.edu; WWW: http://www.cse.fau.edu/~sam

Office hours: T, R: 11:00am-12:00noon, 2:00pm-4:00pm; other times by appointment.

Course objectives:
To provide a solid conceptual understanding of the fundamentals of data communications and computer networks. More specifically,
1. To learn the basic concepts of data communications.
2. To learn the layered architecture of communication protocols.
3. To learn digital signal transmission and encoding techniques.
4. To learn multiplexing techniques.
5. To learn the concepts and techniques in error detection and correction.
6. To learn data link control and its related protocols.
7. To learn LAN architectures and systems.
8. To learn switching techniques.
9. To learn the main protocols and standards of the Internet.
10. To learn basic concepts of internetworking, addressing, and routing.

Prerequisites:
1. COP 3530  Data Structures and Algorithm Analysis
2. CDA 3331C Introduction to Microprocessor Systems

Course outline (book chapters in parentheses):

Part 1: Overview
1. Introduction (1)
2. Network models (2)

Part 2: Physical layer and Media
3. Data and Signals (3)
4. Encoding and Modulation (4, 5)
5. Multiplexing and Spreading (6)
6. Transmission Media (7)
7. Switching (8)
8. Telephone and Cable Networks (9)
Part 3: Data link layer
9. Error Detection and Correction (10)
10. Data Link Control and Protocols (11)
11. Random and Controlled Accesses (12)
12. Local Area Networks (LANs) (13-15)
13. Wide Area Networks (WANs) (16)
14. SONET/SDH (17)
15. Frame Relay and ATM (18)

Part 4: Network layer
16. Logical Addressing (19)
17. IPv4 and IPv6 Protocols (20)
18. Address Mapping, Error Reporting, and Multicasting (21)
19. Packet Delivery, Forwarding, and Routing (22)

Part 5: Transport layer
20. Transport layer in the Internet (UDP, TCP, SCTP) (23)
21. Congestion control and Quality of Service (QoS) (24)

Part 6: Application layer
22. Domain Name System (DNS) (25)
23. Remote Logging, Electronic Mail and FTP (26)
24. World Wide Web and HTTP (27)
25. Network Management (28)
26. Multimedia (29)

Part 7: Security
27. Cryptography (30)
29. Security Protocols, Virtual Private Networks (VPNs) and Firewalls (32)

Grading: Grades will be determined primarily from the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tr>
<td>Homework assignments</td>
<td>25%</td>
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<tr>
<td>Exams</td>
<td>75%</td>
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Your final grade will be based on the scores you have earned from your homework assignments, including a possible term project, and exams, compared to the performance of other students in the class.

Notes:

1. Reading assignments will be announced in class and/or posted on the Web on a regular basis. Students are expected to read the material to be covered in the lectures ahead of time.
2. Submission of homework assignments will be done electronically via either the instructor’s Web page or by accessing the following URL directly. Follow the screen prompts.


3. Changes in class policies and/or office hours may be necessary during the semester and if so the changes will be announced in class and/or in the course home page. It is the student's responsibility to be aware of any such changes.
4. When and whether you attend class is up to you. However, you are responsible for all material presented in class. Missed homework and exams will only be excused by documented evidence, verifying that the student was unable to attend class that day due to causes beyond her/his control.

   All work in this course must be INDIVIDUAL effort unless otherwise specified.