

**SYLLABUS**  
**CprE 530 ST-751U**

**Advanced Computer Networking**

**Fall 2004**

**Instructor:**

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Course web site: USE WEBCT

**Text:**

TCP/IP Protocol Suite, Behrouz A. Forouzan McGraw Hill second edition

**Prerequisites:**

knowledge of basic computer concepts

**Course Objective:**

Design, implementation, and analysis of computer networks and data communications systems. Detailed examination of modern communication standards, protocol systems and their implementation. Transmission technology, packet switching, routing, flow control, and protocols

**Course Requirements and Grading Policy:**

<b>Examinations:</b>	Three midterms (80 min)	75%
<b>Projects:</b>	Programs, homework and labs	25%

Note that:

In accordance with University policy, +/- grading will be used

**Course Learning Objectives:**

Upon completing this course a student will:

- Understand the relationship between network layers, network services and functions.
- Understand the function of each of the layers in the TCP/IP protocol suite.
- Be able to describe the TCP/IP network protocols and the effect of an open network protocol on security
- Be able to snoop traffic from a network and decode the data
- Be able to understand the effect of EM and the goals of TEMPEST and TEMPEST policies
- Be able to write programs the use the TCP/IP socket level interface.
- Understand the tradeoffs used in the design of the network protocols
- Be able to setup routing table for IP
- Be able to describe the functions of the packets used in each of the upper layers
- Be able to describe the function of each of the packets in the most common TCP/IP applications

**Major Topics:**

- Introduction
- Data link Layer
- Network Layer
- Transport Layer
- Sockets
- Application Layer
- System Issues
- IPng
- other networks

**Method of Instruction:**

The course is taught using lectures which are also video taped to the off campus students. The course also has a laboratory component where the students write a network packet sniffer and decoder. The students will write the decode module for each protocol we discuss in class.

In a field of cutting-edge technological engineering students will be required to be creators of knowledge and inventors of processes, not simply users of information. This requirement will make students move beyond being knowledgeable about the content and into the higher realms of analyzing situations, designing systems, and evaluating results. To accomplish these cognitive goals, the emphasis in the classroom will be on the student. Student-centered classrooms will enhance student learning by helping them understand the content on the basis of real-world experiences, engaging them in interactive learning situations, and providing problem-based projects from which they will learn.

## CprE 530

### Tentative Schedule

#### Fall 2004

Class	Day	Date	Topic	Chapter
1	Tue	24-Aug	Introduction	1
2	Thr	26-Aug	Introduction	2
3	Tue	31-Aug	Data link Layer	3
4	Thr	2-Sep	Network Layer	4 - 10
5	Tue	7-Sep	Network Layer	4 - 10
6	Thr	9-Sep	Network Layer	4 - 10
7	Tue	14-Sep	Network Layer	4 - 10
8	Thr	16-Sep	Network Layer	4 - 10
9	Tue	21-Sep	Transport Layer	11, 12
10	Thr	23-Sep	<b>test 1</b>	
11	Tue	28-Sep	Transport Layer	11, 12
12	Thr	30-Sep	Transport Layer	11, 12
13	Tue	5-Oct	routing	13, 14
14	Thr	7-Oct	Sockets	16
15	Tue	12-Oct	Application Layer	17-25
16	Thr	14-Oct	Application Layer	17-25
17	Tue	19-Oct	Application Layer	17-25
18	Thr	21-Oct	<b>No class</b>	
19	Tue	26-Oct	Application Layer	17-25
20	Thr	28-Oct	<b>Test 2</b>	17-25
21	Tue	2-Nov	Application Layer	17-25
22	Thr	4-Nov	Application Layer	17-25
23	Tue	9-Nov	Application Layer	17-25
24	Thr	11-Nov	Application Layer	17-25
25	Tue	16-Nov	Mobile IP	27
26	Thr	18-Nov	Real Time	28
		23-Nov	Break	
		25-Nov	Break	
27	Tue	30-Nov	IPv6	31
28	Thr	2-Dec	IPv6	31
29	Tue	7-Dec	peer to peer	
30	Thr	9-Dec	<b>Test 3</b>	
		14-Dec	Final Week	