SYLLABUS
CprE 530   ST-751U

Advanced Computer Networking

Spring 2004

Note:

The spring semester is a replay of the lectures from the fall semester. Please contact the instructor for any questions that come up during the course. As far as due dates for the assignments, they all have a date and a length. Go by the length of time. I will have no hard deadlines for any assignments or tests. I would like to have everyone finished with the course be mid May. Everything is available as of today, so you can go at your own pace through the course (You can go faster than the schedule if you want)

Instructor:

Doug Jacobson
Dept of Electrical and Computer Engineering
2419 Coover Hall
Iowa State University
Ames, Iowa 50011

Office: (515) 294-8307   Dept: (515) 294-2663
FAX: (515) 294-8581
e-mail: dougj@iastate.edu

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:

Examinations: Three midterms (80 min)	75%
Projects: 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 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

Spring 2004

Class	Day	Date	Topic	Chapter
1	Tue	13-Jan	Introduction	1
2	Thr	15-Jan	Introduction	2
3	Tue	20-Jan	Data link Layer	3
4	Thr	22-Jan	Network Layer (lab 1)	4 - 10
5	Tue	27-Jan	Network Layer	4 - 10
6	Thr	29-Jan	Network Layer	4 - 10
7	Tue	3-Feb	Network Layer (lab 2)	4 - 10
8	Thr	5-Feb	Network Layer	4 - 10
9	Tue	10-Feb	Transport Layer	11, 12
10	Thr	12-Feb	**test 1**	
11	Tue	17-Feb	Transport Layer (lab 3)	11, 12
12	Thr	19-Feb	Transport Layer	11, 12
13	Tue	24-Feb	routing	13, 14
14	Thr	26-Feb	Sockets	16
15	Tue	2-Mar	Application Layer	17-25
16	Thr	4-Mar	Application Layer (lab 4)	17-25
17	Tue	9-Mar	Application Layer	17-25
18	Thr	11-Mar	Application Layer	17-25
			Break	
19	Tue	23-Mar	Application Layer	17-25
20	Thr	25-Mar	**Test 2**	
21	Tue	30-Mar	Application Layer	17-25
22	Thr	1-Apr	Application Layer (lab 5)	17-25
23	Tue	6-Apr	Application Layer	17-25
24	Thr	8-Apr	Application Layer	17-25
25	Tue	13-Apr	Mobile IP	27
26	Thr	15-Apr	Real Time	28
27	Tue	20-Apr	IPv6	31
28	Thr	22-Apr	IPv6	31
29	Tue	27-Apr	peer to peer	
30	Thr	29-Apr	**Test 3**	
		4-May	Final Week	