CS 455 (Undergraduates only)
Introduction to Networks & Communication
Spring 2007
Course Outline

Instructor:	Ravi Mukkamala
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Lecture:	Tuesday 7:10-9:50 PM (Hughes 1117)
Office Hours:	Tuesday 1:30-3:00 PM (E&CS 3317)
Prerequisites:	CS 270, STAT 330U. If you have not taken these courses, contact the instructor.
Text:	*Computer Networks*, Andrew S. Tanenbaum, 4th Edition, Prentice Hall PTR, 2003.

Course Objectives: The main objective of this course is to introduce the students to the basic concepts of networks and data communications. The summary of the contents is as follows.

- The course begins with an introduction to the Open Systems Interconnection (OSI) model proposed by ISO and then discusses the more frequently used TCP/IP reference model.
- At the physical layer, we discuss theoretical limitations for data rates for different media. More importantly, we will look at the wireless and mobile communication systems.
- At the data link layer, we discuss error detection and correction procedures, the stop-and-wait and sliding window protocols, and some methods to specify communication protocols.
- At the medium access level, we discuss ALOHA, Ethernet, wireless LANs, and Bluetooth protocols.
- At the network layer, we discuss different types of routing algorithms and congestion control schemes. The intricacies of internetworking and the IP protocol are also discussed.
- At the transport layer, TCP and UDP protocols are discussed in great detail. In addition, general performance issues in computer networks are discussed.
- The network security concepts will be discussed in four classes. In this context, we will also look at network security issues and cover the secret-key and public-private key algorithms. Kerberos is also discussed briefly.
- Finally, we will look at some day-to-day applications built on top of data networks. The worldwide web and its relationship to the concepts discussed in class are also covered.

Grading Criteria: Your grade will be based on the following:

Mid-term Examination	150 points	2/27/07 (7:10-9:50 P.M.)
Final Examination	150 points	5/1/07 (7:00-10:00 P.M.)
Paper Project	20 points	
Programming assignment	20 points	
Homework	100 points	
Class participation	10 points	
Total	450 points	

Make-up Tests and Late Assignments:
Late homework and papers and make-up exams will not normally be permitted. I will give appropriate consideration to documented emergencies, but such arrangements must be made *prior to the due date* in any situations where the conflict is foreseeable.

Grading Scale:

Percentage	Letter Grade
90-100	A
87-89	A-
84-86	B+
80-83	B
76-79	B-
72-75	C+
69-71	C
62-68	C-
58-61	D+
55-57	D
50-54	D-
0-49	F

Honor Code:
All students are expected to abide by the ODU Honor Code. This means that *all* exams and assignments are to be the exclusive work of the student. An honor pledge will be required on *all* work which is to be graded. For more details on the ODU honor code, refer to the Honor pledge posted on the course web-page.

E-mail:
I will use electronic mail on the CS Dept. network for timely communication, especially of clarification/corrections/changes to homework or projects. Students should check their e-mail on a regular basis.

Homework
These are problems generally assigned from the textbook. There will be six such assignments during the semester, each weighted equally. You will have one week to work on each of the assignments. While the students are encouraged to discuss the problems, each individual should prepare their own answers. Any violation of this rule will be considered as cheating and will be dealt with accordingly.

Programming assignment: This involves writing some C++ programs in topics such as socket programming. These are meant to give you hands-on experience in terms of network protocols and functionality.

Paper project: The main purpose of this project is to integrate the theoretical concepts that students learn in the class with the real-world developments. Since trade journals (e.g., LAN magazine, Network Review, Networks, Communications) contain abundant information on the latest product developments and techniques being practiced (or suggested), they are the best sources to meet the stated purpose.

For this semester, you are required to write one paper. The topic for the paper will be

announced soon in the class. The article should be read, understood, and related with concepts discussed in the class. For each topic, the result will be a four-page write-up (**which is not the same as reproducing sentences or paragraphs from the article**) summarizing what you have learned from the article and relating it to the concepts learned in the class. Instead of providing s separate summary for each article that you have read, you should provide a single summary that integrates the concepts in all articles in a unified manner. You must provide complete references to all referred articles. ODU library and the public libraries are a good source of trade journals. **Do not look at journals such as IEEE Transactions on Communications.** IEEE magazine articles are quite acceptable as they cover practical issues. The intent is to select articles dealing with practical issues or applications.

Class Participation As a student enrolled in this class, you are expected to take an active role in the class. It does not necessarily mean that you ask questions frequently just to make your presence felt. However, when you do have a genuine question, or would like to share your networking experience in a related topic being discussed in the class, consider sharing your thoughts. Whenever I feel that a question being asked is irrelevant to the topic or if it will be answered in future, I shall postpone answering it to a later date. Sometimes, I may discourage questions or differ answering them due to time constraints. 10 points (out of 450 points) are allocated for participation in the class. I will be monitoring your individual participation throughout the semester and allocate points at the end.

Attendance: Attendance at classes is not generally required, but students are responsible for all material covered and announcements made in class. Consequently, if you are going to miss class, be sure to get notes, handouts, etc., from another class member.

Academic Honesty: Everything turned in for grading in this course must be your own work. The instructor reserves the right to question a student orally or in writing and to use his evaluation of the student's understanding of the assignment and of the submitted solution as evidence of cheating. Violations will be reported to the Honor Council for consideration for punitive action. By CS Dept. policy, students found to be in violation of this rule will, at the very least, receive a failing grade in the course and may be subject to stiffer penalties.

Course Outline:
In addition to the chapters listed below, additional readings may be made available via the course web page or through handouts in the class.

Lecture and Homework Schedule

Month	Day	Activity	
January	9	Chapter 2	Physical Layer ((HW1 assigned)
	16	Chapter 3	The Data Link Layer
	23	Chapter 3	Cont. (HW2 assigned)
	30	Chapter 4	The Medium Access Layer
February	6	Chapter 4	Cont. (HW3 assigned)
	13	Chapter 5	The Network Layer
	20	Chapter 5	Cont. (HW4 assigned)
	27	Exam I	Mid-term Examination (Chapters 2-4) (PRG assigned)
March	6	NO CLASS	Spring Holiday
	13	Chapter 6	The Transport Layer (HW5 assigned)
	20	Chapter 6	Cont.
	27	Chapter 8	Network Security
April	3	Chapter 8	Cont. (HW 6 assigned)
	10	Chapter 7	The Application Layer
	17	Chapter 7	Cont. (Paper Due)
	24	Review	
May	1	**Final Examination**	Covers Chapters 2-8 (7:00-10:00 PM)