MSI 416: Communication Networks and Security
University at Albany, State University of New York
Spring 2005

Instructor Information
Name: Sanjay Goel / Jakov (Yasha) Crnkovic
Email: goel@albany.edu / yasha@albany.edu
Phone: (518)442-4925 / (518) 442-5318
Office Location: BA 310b / BA 332
Office Hours: (Goel) M 12:30-2:00 or by appointment / (Crnkovic) MW 10:00 - 11:30am

Class Information
Time: MW 8:30 - 10:15am
Location: BA 233
Dates: January 19 - April 13
Credit(s): 3
Call #: 4315
Available Lab(s): Undergraduate Lab

Course Overview
This course covers the basic technologies required for communication on the networks, including the Internet. The course covers fundamentals of signal transmission, transmission hardware and concepts such as error control and multiplexing. The course also covers Network Topologies, the OSI model, and the TCP/IP protocol suite. We will also discuss the vulnerabilities of the network and techniques for protecting data and networks. Cryptography and Public Key Infrastructure, which are currently used for secure data transmission over the web, will also be discussed. Also discussed in the class are issues of ethics and privacy in the use of computer networks.

Learning Objectives

Students will learn:
1. Hardware and protocols involved in transmission of data over networks
2. Various networking architectures and their applications
3. Use of cryptographic techniques used for secure communication on networks
4. To analyze the threats, vulnerabilities and solutions for information system security
5. Through hands-on experience in auditing & testing the security of computer networks
6. Critical thinking skills via debates on the ethics and legal issues in electronic data access

Text & Reference Books
Text: Data Communications & Computer Networks: A Business Users' Approach by Curt M. White
Reference: Security In Computing (Third Edition) by Charles P. Pfleeger & Shari Lawrence Pfleeger
Reference: Hackers Beware by Eric Cole

Grading

Assignments & Paper: 50%

Assignments
Assignments given in any week is due at the beginning of the class on the same day in the following week. There will be a penalty for late assignments unless there is a very pressing

reason for the delay. Please work individually on all assignments. Stop by the instructor offices if you have difficulty in understanding the assignment or the course material discussed in the class.

Term Paper (Computer Security)
If students are asked to write a term paper the students should make two person teams. Each team must complete a term paper on one of the topics presented by the instructor. The paper should include a broad introduction of the topic and a comprehensive discussion of a few selected aspects of the topic. The paper should be four pages (single spaced, 12 pt text, 1 inch margins) long so the students should make an effort to write four pages of original text. The paper should reflect a clear understanding of the subject by the student. The presentation should not exceed more than five content slides. Please use your critical thinking skills to be concise and focused on both the paper as well as the presentations. As an alternative the instructor may give the students some readings that he/she is supposed to analyze and discuss in the class.

Exam: 50%

Course Schedule

No.	Date	Topics	Readings	Instructor
1	1/19	Introduction / The Big Picture of Networks	Chapter 1	Crnkovic
2	1/24	Fund. of Data & Signals/Hardware & Media Types	2/3	
3	1/26	Connections	4	
4	1/31	Multiplexing/Error Detection & Control	5/6	
5	2/2	LAN	7	
6	2/7	LAN	8,9	
7	2/9	Telecom Systems (Exam I)	12	
8	2/14	Metropolitan and Wide Area Networks	10	
9	2/16	Network Design and Management	14	
10	2/23	Network Design and Management, cont'd.		
11	2/28	Internet	11	
12	3/2	Internet, cont'd.	11	
13	3/7	E-Commerce/M-Commerce	Notes	
14	3/9	Emerging Network Architectures (Exam II)	Notes	
15	3/14	Networking/ OSI Model	Notes	Goel
16	3/16	Introduction to Security/Security Threats I		
17	3/30	Security Lab (Password Auditing)	Notes	
18	4/4	Security Threats II	Notes	
19	4/6	Security Lab (Penetration Testing)	Notes	
20	4/11	Cryptography- Symmetric & Asymmetric / (Exam III)	Notes	
21	4/13	XML & Web Services	Notes	