

CMSC 426/626 – Principles of Computer Security

Fall 2006, MW 1:00 – 2:15 PM, ACIV 013

Prof. Krishna Sivalingam

ITE 331; Phone: 410-455-3961

Office Hours: MW 10:00 AM – 11:00 AM, Or By Email Appt.

Class webpage: umbc.edu/~krishna/cs426/index.html

Email: krishna@umbc.edu

1 Required Text

- Security in Computing, Charles P. Pfleeger and Shari Lawrence Pfleeger, 3rd ed., Prentice Hall, 2003, ISBN 0-13-035548-8.

Supplemental (NOT Required) Texts

- Introduction to Computer Security, Matt Bishop, ISBN 0-321-24744-2, Addison Wesley Professional, 2005.
- Security Engineering, by Ross Anderson, Wiley, 2001.

2 Course prerequisite

CMSC 341 (Data Structures) AND CMSC 421 (Principles of Operating Systems).

NOTE: If you do not satisfy these prerequisites, you SHOULD DROP this course immediately.

3 Course objectives

The objective of this course is to provide an introduction to the principles and practice of computer security. The topics covered include: Basics of computer security covering confidentiality, availability, integrity; an overview of threat, attack and adversary models; essentials of cryptography including public and private-key encryption, hashing and message authentication code, digital signatures; malicious software including viruses, spyware, rootkits, trojans, worms; passwords and authentication; secure programming including defensive programming, isolation and sandboxing; Operating system security in practice covering Windows and Unix systems; trusted operating system design; public policy issues including legal, privacy and ethical issues; network and database security overview.

4 Course Requirements

You are *required* to attend all the lectures. If you miss any of them it is your responsibility to find out what went on during the classes and to collect any material that were handed out.

Class participation is strongly encouraged to demonstrate the level of understanding of the material being discussed in the class. Regular feedback from the class regarding the lecture will be very much appreciated.

5 Tentative Grading Policy

The following allocation of points is tentative. These may change during the semester.

CMSC 426 students:

2 Midterms and Final:	50%
Programming Assignments (2):	40%
Homeworks and Surprise Quizzes:	10%

CMSC 626 students:

2 Midterms and Final:	45%
Programming Assignment (1):	10%
Term project (1):	35%
Homeworks and Surprise Quizzes:	10%

There will be programming assignments that require very good knowledge of C or C++. Familiarity with system calls is required. Both midterms and final will be in-class and closed-book. Quizzes will be given unannounced during the lecture, and no re-takes will be given.

For students enrolled in CMSC 626, there will typically be additional questions on the exams and additional components on the projects. In addition, a term project is required.

The *CMSC 626 term project* can be done individually or as a team, with up to 2 students per team. The student is required to select a suitable project related to computer security, implement a solution to an existing problem, and conduct detailed performance study. A technical report is required as the final product, in addition to the associated software implementation. The final term project report will be a 12-page, single-spaced, 11-point font document, 1 inch margin-spaced document. It should be professional and potentially publishable in a technical magazine/journal such as IEEE Communications, IEEE Network Magazine, etc. More guidelines on interim and final term project reports will be provided soon. Important Dates to remember regarding the term project:

- Oct 9: Project Description (1-page) submitted by student.
- Nov. 15: Prototype due
- Dec 13: Final project due

6 Syllabus and Tentative Due Dates

All chapters are with reference to the prescribed text, except otherwise mentioned. Not all sections in each chapter will be covered. Reading materials for midterm and final will list specific required sections. The listing reflects the order in which the chapters will be covered. Note that the Project and Test dates are tentative and likely to change based on material covered.

Major Topics:

Topics	Approximate Number of Weeks
Introduction to Security in Computing (Ch 1)	1 week
Introduction to Basics of Cryptography (Ch 2)	2.5 weeks
Program Security (Ch 3)	3 weeks
Protection in OS (Ch 4)	1.5 week
Designing Trusted OS (Ch 5)	2 weeks
Chapter 9: Legal, Privacy, Ethical Issues	1 week
Chapter 8: Security Administration	1 week
Database Security (Chapter 6)	1 week
Network Security (Chapter 7)	1 week
Chapters 22-23, 27 - 29 from Bishop's book	As needed to supplement

Tentative Due Dates: Please note these due dates are tentative and might change during the semester.

Assignment	Due Date
Homework 1	10/4
Term project description (CMSC 626)	10/9
Test 1	10/11
Project 1 (426 and 626)	10/20
Homework 2	11/6
Test 2	11/13
Term project Interim (CMSC 626)	11/15
Project 2 (426 only)	12/3
Final	Dec. yz (TBA)
Term project FINAL (CMSC 626)	12/13

7 ADA Compliance

We recognize that some of you may require special attention from the instruction staff. Please inform the instructor of any special needs at your earliest convenience so that UMBC can make suitable arrangements.

8 Policies and expectations

1. The individual assignments are subject to the UMBC Student Academic Conduct Policy.

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory [or for graduate courses, the Graduate School website].

For this course, the penalty for the first academic dishonesty offense is zero credit for all students involved, for the relevant component, IN ADDITION to a lower grade in the course (e.g. if you are in the B range at the end of the semester, you will receive a C). Repeat offenders will be assigned an **F** grade for the course. This is in top of any other disciplinary action as listed above.

2. Anyone who is absent from the class for three consecutive days without contacting the instructor will be requested to drop the course immediately. This policy will be strictly enforced.
3. Computers are likely to break down when you need them the most; start your work *early* and *save* your work frequently.
4. Keep a copy of all the graded components until the end of the semester when the final grades are announced.
5. Late assignments will NOT be accepted.
6. Make up tests and exams: If you will not be able to take the test and require a makeup, you have to let me know at least one week in advance. I will not entertain requests for makeup exams, unless there are serious reasons to do so.
7. 'I' grades will not be entertained unless extenuating circumstances are proved.
8. Good Luck and Have Fun!!