

## CS 4910 Introduction to Computer Security - 3 Credit Hours Syllabus and Course Policies (Fall 2013)

<b>Instructor</b>	Chuan Yue
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<b>Phone</b>	719-255-5155
<b>Course Day &amp; Time</b>	Tu, Th 01:40pm - 02:55pm 08/26/2013 – 12/20/2013
<b>Lecture Location</b>	Columbine Hall, Room: 117
<b>Office</b>	Engineering Building (ENGR) Room 194
<b>Office Hours</b>	Tu, Th 12:00pm - 01:30pm, or by appointment

### COURSE DESCRIPTION AND OBJECTIVE

Introduction to basic concepts, principles, and practices in computer security. Students will learn basic cryptography, user authentication, access control, malicious software, network attacks and protection, software security, and operating system security. Students will also perform hands-on security lab exercises.

### PREREQUISITES

CS 3160 (Concepts of Programming Languages) and CS 3300 (Software Engineering), or instructor consent.

### COURSE MATERIALS

#### **Textbook (required):**

*Computer Security: Principles and Practice (2nd Edition)*, by William Stallings and Lawrie Brown  
ISBN-10: 0132775069, ISBN-13: 978-0132775069

In addition to the textbook, we will discuss a list of recent and classic research papers in computer and network security.

#### **Other books (recommended):**

*Computer Security: Art and Science*, by Matthew A. Bishop, Addison-Wesley (2003); ISBN-10: 0201440997  
*Security Engineering: A Guide to Building Dependable Distributed Systems*, by Ross Anderson  
Wiley (2nd edition); ISBN-10: 0470068523; <http://www.cl.cam.ac.uk/~rja14/book.html>

**Additional Class Handouts** (as we go along, if possible distributed via Blackboard)

**Blackboard Course Site:** <https://bb.uccs.edu>

**Course Slides:** <http://www.cs.uccs.edu/~cyue/teaching/2013CS4910CourseSlides/>

**Reading and Presentations:** <http://www.cs.uccs.edu/~cyue/teaching/2013CS4910ReadingList/papers.htm>

### EMAIL COMMUNICATION

Students are expected to check their UCCS campus e-mail account on a regular (at least weekly) basis. Students may forward their campus e-mail to a private e-mail account, but are expected to assure the forwarding of messages is working properly so they do not miss important email communications.

## COURSE SCHEDULE (TENTATIVE)

I reserve the right to amend this syllabus at any time and the course schedule only represents my best estimate. The latest version is updated on the Blackboard Course Site: <https://bb.uccs.edu>

Week#	Date	Textbook Reading	Topics	Homework/Lab/Project
1	Tu 08/27	Chap 0	Course Introduction, Computer Security Overview	
1	Th 08/29	Chap 1	Computer Security Overview, Cryptographic Tools	Read Cybercrime 2.0 paper*
2	Tu 09/03	Chap 2	Labor Day Holiday (No class, no office hour)	Read How (and How Not) to Write a Good Systems Paper*
2	Th 09/05		Cryptographic Tools	
3	Tu 09/10		Cryptographic Tools	HW 1 assigned
3	Th 09/12	Chap 3	User Authentication	
4	Tu 09/17		Paper Presentation and Discussion – 01	HW 1 due
4	Th 09/19	Chap 4	Access Control	HW 2 assigned
5	Tu 09/24		Paper Presentation and Discussion – 02	
5	Th 09/26	Chap 5	Database Security	HW 2 due
6	Tu 10/01		Invited Talk: Privacy violations by inference attacks; Dr. Rinku Dewri; University of Denver	
6	Th 10/03	Chap 6	Intrusion Detection	Lab 1 (IDS) assigned
7	Tu 10/08		Paper Presentation and Discussion – 03	
7	Th 10/10	Chap 7	Malicious Software	
8	Tu 10/15		Paper Presentation and Discussion – 04	Project Proposal Due
8	Th 10/17	Chap 8	Denial of Service	
9	Tu 10/22		Paper Presentation and Discussion – 05	Lab 1 due
9	Th 10/24	Chap 9	Firewalls and Intrusion Prevention Systems	Lab 2 (Firewall) assigned
10	Tu 10/29		Paper Presentation and Discussion – 06	
10	Th 10/31	Chap 10	Buffer Overflow	
11	Tu 11/05		Paper Presentation and Discussion – 07	Lab 2 due
11	Th 11/07	Chap 11	Software Security	Lab 3 (Web Security) assigned
12	Tu 11/12		Paper Presentation and Discussion – 08	
12	Th 11/14	Chap 12	Operating System Security	
13	Tu 11/19	Chap 13	Trusted Computing and Multilevel Security	Lab 3 due
13	Th 11/21		Paper Presentation and Discussion – 09	Lab 4 (Software Vulnerability Exploitation) assigned
14	Tu 11/26	Chap 14	Security Auditing	
14	Th 11/28		Thanksgiving Holiday (No class, no office hour)	
15	Tu 12/03		Paper Presentation and Discussion – 10	Lab 4 due
15	Th 12/05	Chap 15,16, 17,18,19	Physical and Infrastructure Security, Human Factors, IT Security Management and Risk Assessment, IT Security Controls, Plans and Procedures, Legal and Ethical Aspects, etc.	
16	Tu 12/10		Final Project Presentation	
16	Th 12/12		Final Project Presentation	
17	Tu 12/17		Final Exam (01:40pm – 04:10pm)	
17	Th 12/19			Project Report Due

\* These papers can be accessed at: <http://www.cs.uccs.edu/~cyue/teaching/2013CS4910ReadingList/papers.htm>

## GRADING POLICY

Final grades are computed using the following weights:

Class Attendance and Participation	5%
Homework Assignments	10%
Lab Assignments	20%
Paper Presentation	15%
Final Exam (in-class, open-book, open-notes, written)	25%
Project (required)	25%

All grades are based on a scale from 0-100 as follows:

$93 \leq \{A\};$	$90 \leq \{A-\} < 93;$	
$87 \leq \{B+\} < 90;$	$83 \leq \{B\} < 87;$	$80 \leq \{B-\} < 83;$
$77 \leq \{C+\} < 80;$	$73 \leq \{C\} < 77;$	$70 \leq \{C-\} < 73;$
$67 \leq \{D+\} < 70;$	$60 \leq \{D\} < 67;$	
$60 > \{F\};$		

A linear shift may be applied to **final** grade averages as a one-time scale at the professor's discretion.

## CLASS ATTENDANCE AND PARTICIPATION

Your class attendance and participation will be a combination of attendance, discussion, etc. Class attendance/participation counts for 5% of your grade. Even if you have an excused absence from class (we'll work excused absences on a case-by-case basis), you are 100% responsible for all material and announcements covered in class.

## HOMEWORK/LAB ASSIGNMENTS

Assignments are to be completed on your own unless explicitly noted by your instructor. You may discuss any component of the assignment with your classmates, but there cannot be a physical or electronic record of your conversation (no paper, files, disks, or code of any form) taken away from the conversation. While you are encouraged to discuss with each other students, **you must write your own code and answers, in whole.** You cannot directly use the code or answers that you have found on the Internet. **Copying any portion of the code or answers will result in an automatic zero for the assignments for all students involved. Two or more instances of this in the course will result in an automatic failure for the course.**

Assignments are due at the beginning of class on the specified due day. You should turn in the PDF electronic version of your answers to the questions in each assignment. For some assignments, you also need to turn in the source code or other related files.

### To turn in your assignment:

Log into Blackboard and submit the zipped file into the appropriate homework/lab assignment.

**Late homework submissions:** In case you cannot complete a homework assignment by the beginning of class on the due date, you can take **three** additional days to turn it in with the penalty of 10% for each additional day. Beyond three days from the specified due date, the homework shall NOT be graded, except for justifiable reasons with written evidence, such as an illness with a doctor's written note.

## PAPER PRESENTATION

Two or three students will form a team to present a research paper in 45 minutes. At the end of the 45 minutes, the presentation will be stopped, regardless of whether it is finished. Presentations should be made using a projector. The classroom computer has Microsoft PowerPoint and PDF reader installed. If you use other presentation software, you need to use your own laptop.

The elements of a presentation include a summary of the key points of the paper, background, motivation, and related work, a critique of the paper, and analysis of the lessons to be gained from the paper. The key to a good presentation is selecting what points to cover, not trying to cover everything. Please feel free to use the paper authors' presentation slides (if you can get them), but you should acknowledge this in your presentation and you should also add some new contents based on your understanding of the paper.

A good guideline for your presentation is to have:

- At least ten slides on preceding work, technology that existed before the publication of the paper, and other factors that led to the research described in this paper. What is the background of the paper? What issues were going on when it was written? Why was the research done?
- At least ten slides discussing the important points of the paper. This *is not a summary of the entire paper*.
- At least three slides forming a critical analysis of the paper (both good and bad points).
- At least three slides discussing (possible) following work, the effects of the paper, and where the idea is today. For more current papers, what are the competing ideas and what are your own ideas? What has happened to the paper since publication? [Citeseer](#) or [Google Scholar](#) can help with this, but you need to present more than just the number of citations. How has the idea been applied since then? What happened to it? Why did it (or didn't it) win?

The presenters must email an electronic copy of the presentation file (e.g., PPT or PDF file) to the instructor before the start of the presentation, so it can be made available to other students.

## EXAMS

Exams in this class are in-class, open-book, open-notes (must be your own), and written. The questions asked in the exam will cover the contents from the textbook, lab exercises, and paper presentations.

There will not be any makeup exam, unless you provide convincing evidences in advance and get a pre-approval from both the instructor and our CS Program Assistant Trish Patricia Rea ([prea@uccs.edu](mailto:prea@uccs.edu)).

## PROJECT

Students are required to conduct a research project in this course. At most three students can form a team to perform the same project. You are strongly encouraged to identify a good Computer/Network security research topic by yourself. If you really cannot identify a good topic by yourself, you can select a topic provided by the instructor. You need to write a two-page **project proposal** and a six-page **final project report**. You should use the [Manuscript Templates for IEEE Conference Proceedings](#) (two-column) to write your reports. The content organization of your reports should be similar to those of the conference papers discussed in the class. The originality and quality of your project determine the grade you can earn.

## **PLAGIARISM & CHEATING**

Absolutely no cheating, copying, or plagiarizing on homework assignments, exams, and summaries. Cheating will result in an AUTOMATIC ZERO (0) for the entire homework, exam, or summary. For further details on academic honesty the student is referred to the University Catalog.

## **LATE DROP**

Dropping of a class after the deadline listed in the UCCS Course Calendar (<http://www.uccs.edu/~cic/>) is governed by departmental and college policy. The student must show documented evidence supporting reasons for a request to drop a class after the deadline. Each request is considered on an individual basis for determining acceptance.

## **GETTING HELP**

I'll be available during my official office hours and by appointment. If you stop by my office outside my official office hours without an appointment, I may have time to talk with you immediately, but I may also have the right to schedule an appointment with you for a later time. You can always contact me **anytime by e-mail**; I'll reply you as soon as I can.

## **CAMPUS POLICIES**

- UCCS Course Calendar: <http://www.uccs.edu/~cic/>
- UCCS Student Code of Conduct <http://www.uccs.edu/dos/student-conduct.html>

## **DISABILITIES SERVICES**

Students with disabilities should turn in their disability verification letters within the first two weeks of class. For further information, contact Disability Services, Main Hall 105, 255-3354. For more information, see the Disability Services page: <http://www.uccs.edu/~dservice>

## **MILITARY STUDENTS**

If you are a military student with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact your UCCS course instructor no later than the first week of class to discuss the class attendance policy. Please see the Military Students website for more information: <http://www.uccs.edu/~military>