CSE 5380-001: Information Security
Fall 2018

Instructor Information:

Instructor:	Jiang Ming	GTAs: Haotian Zhang	
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Office Hours:	Friday 10:00-11:50 AM	Office Hours: Wednesday 17:40 - 19:00.	
Faculty Profile:	https://www.uta.edu/profiles/jiang-ming	Class Website:	https://elearn.uta.edu
Section Info:	CSE 5380, Section 001	Lab Section Info:	CSE 5380, Section 002, 003, 004
Meeting Times:	Fri 1:00 to 3:50 PM	Meeting Times:	**Mon. 7:00-10:00 PM, Wed. 7:00-10:00 PM, and Fri. 4:00 to 6:50 PM**
Location:	WH 210	Lab Location:	ERB 106

Course Description:

This is a hands-on introductory security course for upper-level undergraduate students and graduate students. Students will learn the basics of cryptography and methods for protecting systems from attack. We will cover malicious software and other attacks that occur over the network, as well as the perimeter defenses used to stop these attacks. Students will then learn about program vulnerabilities that lead to most of the security problems in computing today. We will conclude with the other administrative issues that security professionals must consider in their jobs.

Course Objectives:

- Use cryptographic primitives directly in order to understand their respective uses and how they work together to provide security.
- Develop simple malware in order to understand hooking and how hooking can be subverted for malicious purposes.
- Set up and use defensive and security testing technologies in the network and operating system in order to see how they defend against attacks.
- Exploit software vulnerabilities in order to understand how they work and how defenses could stop them.
- Study a range of concepts to gain a broad understanding of the field of information security.
- Apply class knowledge in a capture-the-flag simulation exercise at the end of the semester.

Prerequisites:

Operating Systems (CSE 3320 or equivalent) is required.

Required Textbooks and Other Course Materials:

Computer Security: Principles and Practices by William Stallings and Lawrie Brown (3rd edition)
ISBN-13: 978-0133773922 ISBN-10: 0133773922

Note: The instructor reserves the right to modify course policies, the course calendar, and assignment or project point values and due dates.

Course Grades:

Course grades will be based on the following:

Lab Exercises (4 in-lab with 4 pre-lab exercises):	36%
Labs 1 & 3 are worth 7%, Labs 2 & 4 are worth 11%	
CTF Lab:	15%
Exams (2 in-class):	40%
Quiz:	4%
Presentation & Class Participation:	5%

Grades for Exams will be curved by the instructor and scaled to a standard A = 90-100, B = 80-89, C = 70-79 scale. Final grades will simply be the weighted average of the scores, based on the percentages shown above. Small amounts of extra credit may be available, but only on a class-wide basis (no individual requests will be granted). No grade bumps will be offered; 89.99 is a B in this class.

Make-ups: Make-ups for graded activities may be arranged if your absence is caused by illness or personal emergency. A written explanation (including supporting documentation) must be submitted to your instructor; if the explanation is acceptable, an alternative to the graded activity will be arranged. Make-up arrangements must be arranged prior to the scheduled due date.

Class Attendance Policy: At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will be grading attendance based on your participation in each lecture. Also, in every class period, you will learn by actively participating in the process of solving problems and working in small groups. Missing class, therefore, means missing out on learning opportunities that cannot be gained from the textbook.

Lab Attendance and Completion: Attendance to your assigned lab section during lab weeks is mandatory. You are expected to come to lab having completed a pre-lab assignment that will be checked by the GTA before you may begin the lab. The lab hours are fixed. We will allow you to complete an unfinished lab by attending GTA office hours in the following week (max. 1 hour), but at the cost of 10 points (out of 100) deducted from your grade for that lab.

Descriptions of major assignments and examinations with due dates:

- Lab Assignments: In the labs, you will work in pairs to learn how attacks operate and how to defend against them.
  Each lab exercise includes a pre-lab assignment due the Sunday before the lab week.
    1. Cryptography: Set. 10-14
    2. User, System, Network Security (2 weeks): Sep. 24-28 and Oct. 1-5
    3. Malware: Oct. 22-26
    4. Buffer Overflows (2 weeks): Nov. 5-9 and Nov. 12-16
- CTF Lab: Dec. 3-7. CTF Presentations: Dec. 7 in class and Dec. 10: 2:00 to 3:30 PM
  In this lab exercise, you will work in teams in a jeopardy-style capture-the-flag game to earn points awarded by performing security tasks and exercises that you have learned in class and even some new ones. You will give a team presentation showing how you applied class knowledge to the game.
- Quiz (Dec. 7): The quiz covers administrative issues in securing networks.
- Security News Presentation (dates will be arranged for each student):
  Students will give a brief presentation in class on an issue appearing in the news related to class.
- Exam 1, in-class, Fri., Oct. 19
  Covers everything discussed up to and including Week 8
- Exam 2, in-class, Fri., Nov. 30
  Comprehensive; focus on Malware and Buffer Overflows

Course Schedule (Subject to Change):

Week	*Class Dates*	*Topic*	*Activity*	*Due Dates*
1.	Aug. 24	Class Intro + News + Security Principles		
2.	Aug. 31	Crypto Overview		
3.	Sep. 7	Public Key + Homomorphic Encryption	Pre-Lab 1	Sep. 9
4.	Sep. 14	User Authentication	Lab 1	
5.	Sep. 21	Access Control	Pre-Lab 2	Sep. 23
6.	Sep. 28	Intrusion Detection/Prevention	Lab 2.1	
7.	Oct. 5	Malware	Lab 2.2	
8.	Oct. 12	Firmware Security + Exam Review		
9.	Oct. 19	EXAM 1	Exam 1 + Pre-Lab 3	Oct. 21
10.	Oct. 26	Anti-Malware + Binary Code Analysis	Lab 3	
11.	Nov. 2	Buffer Overflows	Pre-Lab 4	Nov. 4
12.	Nov. 9	Overflow Defenses	Lab 4.1 + Pre-CTF	Nov. 11
13.	Nov. 16	Hardware-assisted Malware Analysis	Lab 4.2	
14.	Nov. 23	THANKSGIVING		
15.	Nov. 30	EXAM 2	Exam 2 + CTF Lab	
16.	Dec. 7	Quiz + CTF Presentations	Quiz + CTF Presentations	
17.	Dec. 10	CTF Presentations	CTF Presentations	Dec. 10

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Jiang Ming

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (http://wweb.uta.edu/aao/fao/).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the **Office for Students with Disabilities (OSD)**. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364.
Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671.

Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit www.uta.edu/eos. or information regarding Title IX, visit www.uta.edu/titleIX.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents' Rule 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Additionally, there is a special ethics form for this course about malicious hacking that you must sign and uphold.

Student Support Services Available: The University of Texas at Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. These resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals to resources for any reason, students may contact the Maverick Resource Hotline at 817-272-6107 or visit http://www.uta.edu/resources for more information.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at: http://www.uta.edu/oit/cs/email/mavmail.php.

Students will be given accounts for the ASCENT security-teaching lab. All students are expected to be responsible users of the computer systems used for this course. In particular, students are expected to abide by the code of ethics associated with this course.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit http://www.uta.edu/sfs.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is right in front of you when you exit the classroom. When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at: http://www.uta.edu/universitycollege/resources/index.php

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at **817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also dial **911**. Non-emergency number 817-272-3381.