CMSC 355
Introduction to Computer and Network Security
Fall 2019
http://marmorstein.org/~robert/Fall2019/cs355.html

Lecture (Stevens 118): 9:30am – 10:45am (TR)

Instructor: Robert Marmorstein **Office:** Ruffner 329
Office Phone: 434-395-2185 **E-mail:** marmorsteinrm@longwood.edu
Office Hours: 2:00pm-4:00pm MWF, 3:00pm-4:00pm R *or by appointment*

To make an appointment to see me, please contact me by e-mail and send me your schedule. Include as much detail as you can about why you need to see me (this saves time). In general, I need at least 24 hours of notice to schedule an appointment.

Course Description: A course dealing with basic techniques in computer and network security. Topics covered include elementary cryptography, secure programs, malicious code, protection of operating systems, database security, network security, security administration and legal issues. 3 credits.

Prerequisite: ***CMSC 140 or 160 AND either CMSC 201 or ISCS 371.***

Student Learning Outcomes: By the end of the course, the successful student will be able to:
– describe common security vulnerabilities and how they can be both exploited and mitigated
– identify and correct security weaknesses in system and network configuration
– use safe programming techniques and best practices

Course Structure and Student Expectations:
This is a lab-driven course with significant lecture and reading components. In addition to regular attendance at lecture, you should expect to spend roughly six hours a week reading the textbook, completing projects, and working on homework exercises.

Textbook: The textbook for this course is "Elementary Information Security",
2nd edition, by Richard E. Smith, Jones & Bartlett Publishing, ISBN: 978-1-284-05593-1

Course Requirements: Your grade will be determined by your performance on the quizzes and homework assignments (25% of your grade), lab projects (50%), participation (5%), the midterm exam(10%) and the final exam (10%).

University Policies:
This course adheres to the university policies found at
http://www.longwood.edu/academicaffairs/syllabus-statements/.

Grading Policy:

Your final grade in this course is computed using a weighted average of your scores on each assignment. The weights for each category are given in the course requirements section of this syllabus and can be used by applying the following formula:

Final Grade = 0.50*Projects + 0.25*(Homework and Quizzes) + 0.05*Participation + 0.10*Midterm + 0.10*Final

Each of the category grades (such as Projects) can be computed by summing the points you've earned on each assignment in that category and dividing by the total number of points possible. Numeric grades are translated to letter grades using the following grading scale:

		100-91: A	90:	A-
89:	B+	88-81: B	80:	B-
79:	C+	78-71: C	70:	C-
69:	D+	68-64: D		

63 or lower: F (There is no grade of D- in this course. Anything below a 64 is failing)

Late Work:
In general, I do not accept late work or grant extensions on assignments unless you have a serious medical or family emergency which prevents you from completing the assignment on time (however, see "Slip days" below). In such cases, you do not need a doctor's note, but you must notify me of the circumstances within a reasonable amount of time.

Since slip days do not apply to homework or quizzes, I may occasionally be persuaded to grant extensions on these assignments. However, in cases where I grant such extensions, I will impose a penalty of 25% per day overdue.

All requests for extensions (whether for an emergency or not), MUST be submitted by e-mail within a reasonable amount of time (typically twelve hours from the original due date). This e-mail should outline (in detail) the reasons your work is late. Granting of extensions is entirely at my discretion – if you have not turned an assignment in on time, you should expect to earn a 0%.

Slip Days:
You will be allocated a fixed number of slip days at the start of the semester. You may use your slip days to extend the due date of one or more *programming projects*. You can use all of your slip days on one assignment or you may use them over multiple assignments.

Slip days are calculated from the minute the assignment is due until you turn it in. The number of slip days used is rounded *up* to the nearest integer value. That means that if you turn an assignment in 24 hours and 1 minute after the due date, you will use up *two* slip days. The slip day clock runs over weekends and holidays. If a lab is due on Friday and you turn it in on Monday, you will have used three slip days, not one. Slip days cannot be shared, traded, bought, or sold, but can occasionally be earned by participation in relevant campus activities I select.

Attendance:
I expect you to attend class unless you are sick or engaged in a school-sponsored sport or extracurricular activity. Please do NOT come to class if you are sick. Instead, contact me within 12 hours of the absence to check whether you've missed any work and make arrangements to make up any missed quizzes. You should also make arrangements to get notes from another student in the class. You should also check the course web site for announcements, new assignments, and other important updates.

I will rely primarily on your honor for enforcement of the attendance policy. However, I will keep a record of your attendance. In accordance with Longwood policy, missing more than 10% of scheduled class time (5 class sessions) to unexcused absences may, at my discretion, result in loss of one letter grade and missing 25% of class or more (14 sessions), whether excused or not may result in an automatic failing grade.

Cell Phones and Laptops:
Cell phones, music players, and laptops are to be turned off and put away during class, except as needed for the lab sessions. Violations of this policy will be considered an **unexcused** absence. I will not interrupt class to notify you if you have been counted absent for use of a prohibited device. Feel free to contact me by e-mail at any point in the semester to check on the number of absences you have in my class.

Food and Drink:
You may bring non-alcoholic beverages, including soft drinks, to class. However, please do not eat in class (it distracts me and the other students). Violations of this policy will be considered an **unexcused** absence. I will not interrupt class to notify you if you have been counted absent for violation of this policy. Feel free to contact me by e-mail at any point in the semester to check on the number of absences you have in my class.

I occasionally grant exceptions to this rule for students who must otherwise forgo lunch or have medical needs that require them to eat in class. If you feel that you need such an exception, you must make arrangements with me in advance (i.e. before bringing food to class).

Honor Code and Collaboration:
I firmly believe in the honor code. As such, I encourage you to actively collaborate with other students and to discuss homework problems. However, there is a point at which collaboration becomes cheating. To help you understand the line between acceptable discussion of a project and dishonorable behavior, I ask you to observe the following rules:

1. Exams and quizzes are to be completed entirely on your own. You may not discuss them with anyone or use any resources except those specifically outlined on the exam handout.

2. You must give proper attribution.

Whenever you receive help or use an online resource, you should comment your code to give proper credit. A simple comment like:

/ based on http://codewarrior.com */*

or

/* Jessica helped me with the curly braces here */

is fine. This comment should go directly above or on the same line as the code on which you received help, so that it is clear exactly which parts of your program are original and which are not. You do NOT need to cite material you obtain directly from me (in lecture, the assignment handout, or office hours). In general, you also do NOT need to cite material taken from the textbook.

3. The work you submit should, in general, be either your own original work or material which I have provided and you have suitably modified yourself.
At no point should another student touch your keyboard while helping you with a project. ***For homework and projects, everything you turn in should be something YOU have personally typed or hand-written. You may NOT copy code electronically from other students or the Internet.***

You MAY NOT share code with other students using flash drives, cell phones, e-mail, web sites, floppies, CDs, or other means unless I specifically direct you to do so. You MAY NOT print out copies of your code to share with other students (personal copies or copies to show me during office hours are fine).

You MAY use web sites, books, and the man pages as reference materials. However, you must cite them appropriately and you MUST re-type any code you find and not just download it or copy/paste it.

4. Do not copy large blocks of code from other students or the Internet.

You MAY assist other students or get assistance with simple problems like syntax errors, but you MAY NOT copy large blocks of code, such as entire classes or functions, from each other. A good guideline of what "large" means is that copying more than three complete programming statements is usually too much.

5. You are responsible for securing your code.

Helping other students to cheat is also cheating. Furthermore, it is your responsibility to make sure that other students do not use your work to cheat. Be careful with who you let access your account and report any missing files, flash drives, or other devices to me promptly.

Infractions of these policies will be dealt with harshly under the Longwood Honor Code. Any student convicted of an honor offense involving this class will automatically receive a final course grade of **F** in addition to any penalties imposed by the Honor Board. You should consider all work in this class to be pledged work, whether or not the pledge appears on the assignment.

If you have questions about the honor code policy, PLEASE ask me. It is much better to receive a late penalty on a single assignment than to fail the course and face honor board charges.

You may find the scenarios at https://integrity.mit.edu/handbook/writing-code helpful in understanding this policy. While their honor code policy is not identical to mine it is very, very similar.

Tentative Course Schedule:

Week1 (Aug. 27 – 29)	Introduction, Risk, Ethics, and Incident Response Evidence and Data Storage ***(Read Chapters 1 and Sections 5.1 – 5.2)***
Week 2 (Sept. 3 – 5)	Physical Security, and Social Engineering ***(Read Chapter 13)***
Sept. 3	***Last Day to Drop (by 5pm)***
Week 3 (Sept. 10 – 12)	File Security, File Sharing Permissions and Authorization ***(Read Chapters 3 and 4)*** ***Lab 1: Linux Software and File Permissions***
Week 4 (Sept. 17 – 19)	Viruses and Malware, Secure Programming, Buffer Overflows, and Memory Protection ***(Read Sections 2.2–2.8)*** ***(Read*** http://www.linuxjournal.com/article/6701***)***
Week 5 (Sept. 24 – 26)	Authentication, Passwords, and Biometrics ***(Read Chapter 6)*** ***Lab 2: Passwords***
Week 6 (Oct. 1 – 3)	Exploits (***Read Sections 5.3 – 5.8***) ***Lab 3: Exploits***
Week 7 (Oct. 8 – 10)	Catchup, Midterm Review, **Midterm Exam** ***(Read Chapter 7)***
Oct. 14 – 15	***Fall Break***
Week 8 (Oct. 17)	Cryptography, Ciphers, and Cryptographic Hashes ***(Read Chapters 8 and 9)*** ***Lab 4: Cryptography***
Week 9 (Oct. 22 – 24)	Web and Database Security ***(Read Chapter 16)***
Week 10 (Oct. 29 – 31)	Network Security, Virtual Private Networks, Availability, Spoofing, Black-hole Routing ***(Read Chapters 10 and 11)*** ***Lab 5: Denial of Service***
Week 11 (Nov. 5 – 7)	Firewalls and Intrusion Detection ***(Read Chapter 12)***

Week 12 (Nov. 12 – 14)	Wireless Security ***(Read Chapter 14)*** ***Lab 6: Firewalls***
Week 13 (Nov. 19 – 21)	E-mail Security and Spam ***(Read Chapter 15)***
Week 14 (Nov. 26 – 28)	Privacy and Ethics, Digital Steganography (***Read Chapter 17***) ***Lab 7: E-mail Spoofing***
Nov. 27 – 29	**Thanksgiving Break: NO CLASS**
Week 15 (Dec. 3 – 5)	Catchup and Review
Dec. 13	**Final Exam (Friday, 11:30am – 2:00pm)**

Major Assignments:

Tests: There will be two exams: a midterm exam on Thursday, Oct. 10th and a comprehensive final exam on Friday, Dec. 13th.

Projects: This class is heavily project-driven. You will complete at least six or seven projects during the course of the semester. While I will give you some time in class to work on these, you should budget a sufficient number of hours outside of class to successfully complete the labs. Please see the tentative schedule above for due dates.

Quizzes and Homework Problems: In addition to homework assignments, I will give unannounced (pop) quizzes over topics from the reading assignments.