

CMSC 355: Introduction to Computer and Network Security (3 credits) Fall 2017

Instructor: Robert Marmorstein, 395-2185, marmorsteinrm@longwood.edu

Lecture: 12:30pm - 1:45pm TR, Ruffner 350

Course Web Site: <http://marmorstein.org/~robert/Fall2017/cs355.html>

Office Hours: 2:00pm - 3:00pm MTWRF or by appointment, Ruffner 329

(To make an appointment to see me outside my usual office hours, please send me e-mail at least 24 hours in advance)

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.

Course Objectives:

The student will learn to:

1. describe common security vulnerabilities and how they can be both exploited or mitigated
2. identify and correct security weaknesses in system and network configuration
3. use safe programming techniques and best practices

Textbook:

The textbook for this course is "Elementary Information Security", 2nd edition, Richard E. Smith, Jones and Bartlett Learning, ISBN: 9781284055931

Grading Policy:

Late work will not be accepted unless you have a medical condition or family emergency which prevents you from completing the assignment on time. In such circumstances, you do not need a doctor's note, but you must contact me by e-mail at least 12 hours before the assignment is due to explain the circumstances and arrange to make up the work.

Cell Phones and Laptops:

Cell phones, music players, and laptops must be turned off and put away during lecture and class discussions. Violations of this policy will be considered an unexcused absence and may also affect your homework or participation grades.

Food and Drink:

Please do not eat in class (it distracts me and the other students). You may bring water or other non-alcoholic beverages to class. I occasionally make exceptions to this rule for students who would otherwise miss 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 before you bring food to class. Violations of this policy will be considered an unexcused absence and may also affect your homework or participation grades.

Attendance:

This class is heavily lecture-driven and will require your regular attendance. I expect you to attend class unless you are sick or engaged in a school sponsored sports event or extra-curricular activity. In accordance with Longwood policy, missing more than 10% of scheduled class time will result in loss of one letter grade. Absences for school events or illness may be excused if you make arrangements with me within 12 hours of the missed class. Students who miss more than 25% of classes, for any reason, may at my discretion receive an F for the course.

Course Requirements:

Your grade will be determined by your performance on the quizzes and homework assignments (15% of your grade), lab projects (50%), participation (5%), the midterm exam (15%) and the final exam (15%).

Grading Scale:

Letter grades will be assigned using the following scale. Note that there is no grade of D- in this class.

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

Honor Code:

You should consider all work for this class to be pledged work.

You may discuss homework problems with other students *as long as the answers you submit are your own, are in your own words, and were written or typed by you personally.* You **may not** copy answers to problems or lab exercises from the Internet.

Tests and quizzes must be completed entirely on your own. All tests and quizzes will be taken closed-book and closed-notes.

You MAY discuss the laboratory projects subject to the following restrictions:

1. *You should type any commands or lines of code yourself.*

If you are helping someone else – keep your hands off the keyboard. I want to see that each of you can figure out what to type, so it's important that any file you turn in be something you generated on your own.

2. *Only discuss the project in general terms*

I want to see that you understand the concepts behind the lab well enough to figure out how to complete the labs. It's okay to discuss security vulnerabilities and threats in the abstract, but it's not okay to tell someone exactly what to type.

Infractions of this policy will be dealt with harshly under the Longwood Honor Code. A student convicted of an Honor Code offense involving this class will receive a grade of F for the course in addition to any penalties imposed by the Honor board.

Tentative Course Schedule:

Please check the course web site regularly for updates and project due dates.

Week1 (Aug. 22 - 24)	Introduction, Physical Security, and Social Engineering (Read Chapters 1 and 2)
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Aug. 28

Last Day to Drop (by 5pm)

Week 2 (Aug. 29 - 31)	File Security, Viruses and Malware, File Sharing Permissions and Authorization (Read Chapters 3 and 4) Lab 1: Linux Install
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Week 3 (Sept. 5 - 7)	File systems, Incident Response, Digital Evidence (Read Chapter 5)
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Week 4 (Sept. 12 - 14)	Authentication, Passwords, and Biometrics (<i>Read Chapter 6</i>) <i>Lab 2: Passwords</i>
Week 5 (Sept. 19 - 21)	Secure Programming, Buffer Overflows, and Memory Protection (<i>Read http://www.linuxjournal.com/article/6701</i>)
Week 6 (Sept. 26 - 28)	Exploiting program vulnerabilities <i>Lab 3: Exploits</i>
Week 7 (Oct. 3 - 5)	Catchup, Midterm Review, Midterm Exam
Week 8 (Oct. 10 - 12)	Cryptography, Ciphers, and Cryptographic Hashes (<i>Read Chapters 7 and 8</i>) <i>Lab 4: Cryptography</i>
Oct. 16 - 17	Fall Break
Week 9 (Oct. 19)	Web and Database Security (<i>Read Chapter 16</i>)
Week 10 (Oct. 24 - 26)	Network Security, Virtual Private Networks, Availability, Spoofing, Black-hole Routing (<i>Read Chapters 10 and 11</i>) <i>Lab 5: Denial of Service</i>
Week 11 (Oct. 31 - Nov. 2)	Firewalls and Intrusion Detection (<i>Read Chapters 12 and 13</i>)
Week 12 (Nov. 7 – 9)	Wireless Security (<i>Read Chapter 14</i>) <i>Lab 6: Firewalls</i>
Week 13 (Nov. 14 - 16)	E-mail Security and Spam (<i>Read Chapter 15</i>)
Week 14 (Nov. 21)	Privacy and Ethics, Digital Steganography (<i>Read Chapter 17</i>) <i>Lab 7: E-mail Spoofing</i>
Nov. 22 - 24	Thanksgiving Break
Week 15 (Nov. 28 - 30)	Catchup and Review
Dec. 7	Final Exam (Thursday, 8:00am)