Course Syllabus
CS 558 - Introduction to Computer Security
Spring 2024

Instructor: Xin Zhang
Meetings: Jan 16 - May 2, MWF 12:00 PM - 1:00 PM, in S1 140
Office hours: MW1:15 PM - 2:15PM on Zoom(https://binghamton.zoom.us/my/xzhang99), in-person at N24, or by appointment
Office: N24
Email: xzhang99@binghamton.edu

TA: Yuqiao Meng
TA office hours: M 3:00 PM - 4:00 PM, F 5:00 PM - 6:00 PM
Place: N00
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Course Description

This course serves as a fundamental introduction to the broad field of computer security. Key areas of focus include cryptography, system security, software security, web security, and network security, alongside an in-depth exploration of various secure applications. Additionally, the course is designed to enhance your skills in comprehending and applying security principles in practical scenarios.

Credit Hours and Contact Hours

- Credit hours: 3
- Contact hours per week: 3
- This course is a 3-credit course, which means that in addition to the scheduled meeting times, students are expected to do at least 6.5 hours of course-related work outside of class each week during the semester. This includes time spent completing assigned readings, participating in lab sessions, studying for tests and examinations, preparing written assignments, and other course-related tasks

Learning Objectives

This course offers a comprehensive introduction to computer security. Students will gain a thorough understanding of the subjects discussed, which may include:

- **Principles of computer security:** information security goals
- **Cryptography:** symmetric key crypto, public key crypto, hashing
- **System security:** authentication, authorization, trusted computing
- **Software security:** software vulnerabilities, software vulnerability discovery, malware, malware analysis
- **Web security:** SQL injection, XSS and CSRF, Clickjacking and phishing

- **Network security:** authentication protocols, real-world security protocols such as SSH, SSL/TLS, Kerberos, and IPSec

Prerequisites

- Programming experience with C/C++, Python and Java

Relationship to ABET

N/A

Recommended Textbooks

- **Principles of Information Security**, Whitman & Mattord, CENGAGE Learning

Course Schedule

The tentative course schedule is available here. The lecture slides will be posted on the schedule page.

Evaluation components and grading

The evaluation components and the corresponding weights are as follows:

Component	Weight
Written assignments	15%
4 Programming projects	40%
Mid-term exam	20%
Final exam	20%
Attendance and participation	5%

Your raw final score will be calculated as

$$\sum_{\forall components} (\frac{Your\ points\ of\ the\ component}{Full\ points\ of\ the\ component} \times weight\ of\ the\ component)$$

The raw final score will be curved based on the overall score distribution of the class. Your letter grade will be determined based on the curved scores. In other words, the final letter grade will reflect the ranking of your raw final score within the whole class.

Homework assignments and programming projects

- **Homework assignments**: Throughout the semester, several *individual* written assignments will be assigned, each focusing on specific topics covered in the lectures. These assignments will be distributed to students upon completion of the related lectures. Each assignment will consist of a series of questions. More detailed information about these assignments will be provided as the course progresses.
- **Programming Projects**: Students need to complete 4 *individual* programming projects. Similar to the written assignments, each project will also cover a certain category of topics we discuss. More detailed information about these projects will be provided as the course progresses.
- **Work submission**: The Brightspace system will be used for both written assignments and project submissions. The submission page will be closed after the due date. If you need to submit a late assignment/project, email it to the instructor and state in the email how many days you are late.
- **Collaboration**: **All the projects should be completed on your own**. You may consult with your classmates on general issues about an assignment, but codes and solutions should remain private. You should neither show another your program source code nor look at anyone else's source code. Submissions will be screened for code sharing by an automated tool.
- **Late policy**: All the written assignments and projects should be submitted before the due date to avoid late submission penalties, which are **10% (of what scored) for each of the first two days late, and 20% for each of the days thereafter**.
- **Extension:** If you are facing extenuating circumstances that might necessitate an extension, it's important to communicate with the instructor well in advance of the deadline. Please avoid waiting until the last minute or after the assignment's due date to discuss these matters.

Exams

There will be two exams during the course. The first exam(mid-term exam) will cover material from the first half of the course, while the second(final exam) will cover the latter half during the final exam week. The format and style of questions in these exams will be similar to those found in the written assignments. By engaging with both the lectures and homework, you should be well-prepared to perform successfully in these exams. For these exams, students are permitted to bring their own materials in paper form; however, electronic devices are strictly prohibited.

Attendance

Students are required to attend each lecture as scheduled. Throughout the semester, students are allowed to use up to **5 days** in which their absence will be excused. Extended absences should be notified to the instructor before the absence is taken, and be supported by proper documentation such as doctor's notes for sick leave. Attendances will be taken in the form of pop-up (i.e., unannounced) quizzes. **Taking attendance quizzes while absent from class is an act of academic honesty violation. Such a violation, once detected, will lead to zero credit in the "attendance" grading component.**

Academic Honesty Code

All the students should read the CS Faculty Letter to Students Regarding Academic Honesty and follow the Student Academic Honesty Code by the Watson School. You are responsible for reading and understanding this

honesty code. Dishonesty and cheating in all academic work related to this course, when discovered, will result in zero credit for the work, plus further penalty defined by University policy.

Managing Stress

If you are experiencing undue personal or academic stress at any time during the semester or need to talk with someone about a personal problem or situation, I encourage you to seek support as soon as possible. I am available to talk with you about stresses related to your work in my class. Additionally, a wide range of campus resources is available to provide help, including:

- Dean of Students Office: 607-777-2804, https://www.binghamton.edu/dean-of-students/
- CARE Team: 607-777-2804, https://www.binghamton.edu/services/care-team/index.html
- University Counseling Center: 607-777-2772, https://www.binghamton.edu/counseling/
- Title IX Office: https://www.binghamton.edu/services/title-ix/
- Interpersonal Violence Prevention: 607-777-3062
- Office of International Student & Scholar Services: 607-777-2510, https://www.binghamton.edu/international/student-scholar-services/index.html

Students with Disabilities

Any student with a disability needing academic adjustments or accommodations should contact the instructor immediately. And you may contact the Services for Students with Disabilities: 607-777-2686, https://www.binghamton.edu/ssd/index.html

Computers and Other Electronic Devices

Light laptop/tablet use in class is allowed. But it should not affect other students and the instructor.