

Ohio Northern University
ECCS Department
ECCS-3411 Computer Security
Spring 2025

Instructor: Dr. Farha Jahan

Instructor Information

Office Location: JLK 238
Email: f-jahan@onu.edu

Class Information

Class Location: JLK 209
Lab Location: JLK 205
Class Time: MW 2:00-2:50 pm
Lab Times: T 12:00, 3:00 pm

Office Hours

MW: 10 am-11:30 am
F: 10 am-12 pm
Any other time by appointment
or available in my office

Catalog Description (3 credits)

Security goals, secure design principles, social engineering, authentication, cryptography, access control, intrusion detection systems, software vulnerabilities, malicious software, security management and risk analysis, and attack methodologies. Integrated laboratory experience.

Prerequisite: ECCS 2671 Minimum Grade of D. Must be enrolled in one of the following Classifications: Junior, Senior.

Course Notes:

All course-related information will be available at Canvas.

Textbook:

- William Stallings and Lawrie Brown, "Computer Security: Principles and Practice," 4th ed. Pearson 2018, ISBN-13: 978-0134794105.

Course Outcomes:

1. Explain the fundamental security design principles.
2. Discuss security threats and cyberattacks and investigate a recent incident by examining associated vulnerabilities and proposing effective mitigation strategies. (KEEN eKSO 3a, 6c)
3. Explain social engineering attacks and demonstrate the use of the Social Engineering Toolkit (SET).
4. Explain the operation of symmetric and asymmetric encryption algorithms.
5. Describe the mechanisms of user authentication and demonstrate password-cracking techniques using John the Ripper.
6. Explain the fundamental operations of malware, including viruses, worms, and Trojans, and discuss effective mitigation techniques. (KEEN eKSO 2f)
7. Explain the basic concepts of Denial-of-Service, Flooding, and Distributed Denial-of-Service attacks.
8. Describe the roles of Intrusion Detection Systems (IDS), Intrusion Prevention Systems (IPS), and Firewalls, and utilize Snort to configure and manage firewall rules. (KEEN eKSO 3h)
9. Explain injection attacks and describe secure software development practices to mitigate such vulnerabilities.

ABET Students Outcomes:

CS 2.A.ii Explores multiple solution paths.

CS 3.C.ii Present technical information effectively (graphs, tables, equations).

CS 4.B.ii Recognize and evaluate potential impacts while making informed ethical and professional decisions.

CpE 1.i Identify and formulate complex engineering problems.

CpE 4.i Explore how an existing engineering solution has met societal needs with consideration of global, economic, environmental, and societal contexts.

Course Outline:

- Introduction to Computer Security.
- Social Engineering
- Cryptography
- User Authentication
- Malicious Software
- Denial-of-Service Attacks
- Intrusion Detection Systems
- Firewalls
- Software Security
- Security Management and Risk Assessment
- Legal and Ethical Aspects
- Group Project

Grading:

Attendance and Class Participation:	5%
Reading Quizzes and Assignments:	10%
Labs:	15%
Project 1:	10%
Project 2:	15%
Midterm exam:	20%
Final Exam:	25%

A: 90-100, B: 80-89.9, C: 70-79.9, D: 60-69.9 and below 60 is F.

The final exam is scheduled at 2 pm on Monday, May 12th, 2025.

NOTE: Students are expected to complete and submit all homework and lab assignments by the due date. Late assignment submissions will only be permitted if arrangements have been discussed and approved before the due date. If you do not understand an assignment or have any questions don't hesitate to get in touch with me; remember, I am here to help YOU!! Make-up tests will only be given in case of an emergency and only at the instructor's discretion. The examination must be taken as scheduled or as announced in class. Exceptions could be absences, only be made in extenuating circumstances and at the discretion of the instructor. Make-up exams will differ from those given in class but will cover the same material.

Attendance: Attendance is mandatory in the class. There will be 3 excused absences. Please contact the instructor before class if you are unable to attend the class. If you will be away due to a field trip, athletic competition, or similar ONU-sponsored activity, please inform us ahead of time. Students are responsible for all missed work.

Course Components: All the course materials will be posted on Canvas.

Reading Quizzes: Reading quizzes are assigned regularly after every class and are due in a week. They will be based on topics discussed in class.

Laboratory: Some labs are performed individually, and some are in groups. At the end, each student will turn in a complete lab report. The lab report is due on Canvas the following Monday at midnight, 11:59 p.m.

Project: Two projects will be assigned to reinforce the course material and enhance learning. More details will be provided on them.

Assignments: From time to time various kinds of assignments will be issued such as researching a topic, writing a short report, studying the application, etc. Guidelines will be provided.

Lab Policy:

Attendance: Attendance in the lab is mandatory. Missing a lab will result in a zero in the lab report until the student completes the make-up lab within a week. Lab makeup will only be allowed if the student has a valid reason, such as a health issue or athletic travel. It is the student's responsibility to make up the lab independently; however, the student must inform the instructor of the day and time for doing the make-up lab. A tailored or different lab handout may be given to the student for the makeup lab.

Lab Clean up: After lab work, each group is responsible for cleaning up the configurations made to PCs and devices. Failing to do so, a penalty of up to -10 points in the lab report can be applied.

There might be some instances where your instructor is unable to make it to Ada due to weather or other reasons; in such cases, an announcement will be made either in a prior class or via Canvas as to how the class will be held that day.

First Week of March

Mon, March 3	Class TBD
Tue, March 4	Section 2 Lab, covered by TA after 4 pm

Office Hours and E-mail:

Students can see me during Office hours as listed on Page 1. In case I am not available, please email me to schedule an appointment. As your instructor, I am here to help and will do my best to respond to e-mails within 24 to 48 hours. Students are expected to check their ONU email accounts frequently for important course information.

Campus Emergencies:

In the event of a campus emergency, including weather emergencies, consult the campus homepage (www.onu.edu) for information. If a class is canceled for reasons other than campus or weather emergencies, an announcement will either be made in class or sent via onu.edu e-mail by your instructor. Then, an online class will be arranged during class time through Google Meet, and the Google Meet link will be emailed through Canvas announcement.

ONU Common Course Policy

Ohio Northern University is dedicated to providing an equitable educational experience for all enrolled students. Universal course policies applicable to all courses can be found at the following link: https://my.onu.edu/registrars_office/policies. Specifically, this website includes the policies for the following topics:

- Academic Dishonesty Policy
- Academic Accommodations Policy
- ONU Health and Safety Policy
- Title IX Policy
- Diversity, Equity, and Inclusion Statement