

CSCY 3740: Computer Security

Department of Computer Science and Engineering
College of Engineering, Design, and Computing
University of Colorado Denver
Fall 2023

Instructor Information

Section 001 – Cross-listed as CSCI 3740

Instructor: Javier Pastorino (website)	Class Meeting Days: Tuesday & Thursday
Email: javier.pastorino@ucdenver.edu	Class Meeting Hours: 12:30 – 1:45 pm
Phone: 303-315-1408	Classroom Location: LSC-844
Office: LW 320-E	TA: TBA
Office Hours: times posted on Canvas. Appointments are required. Schedule through Calendly .	

General Information

Catalog Description

Introduces basic knowledge of the computer security area. Topics covered in this course include cybersecurity ethics, penetration testing, robust programming practices, and security lifecycle. Students will gain an understanding of ethics in cybersecurity with the tools for ethical decision-making, learn methods of exploiting vulnerabilities and perform penetration testing on a simple network, understand the characteristics of robust programming to implement programs that are free from vulnerabilities, and understand security-related concerns in a system lifecycle and how security principles can be applied to improve security throughout a system.

Course Objectives

This course is intended to provide students with insights into cybersecurity. Students will learn about legality and ethics in programming and cybersecurity, gain skills in assessing and testing for vulnerabilities, and learn about secure software development process techniques.

Course Format

This course will be conducted in person with two 75-minute sessions each week.

Prerequisites and Co-requisites

Prerequisites: This course requires **CSCI-2421** with a **C-** or higher grade.

Co-requisites: None

Note: Each student must sign the online Prerequisites Agreement form to receive credit for the course. If this form is not completed by 5:00 pm on Friday of week 1, the student will be administratively dropped from the course. *The form is linked on Canvas.*

Learning Outcomes

Expected Knowledge at the Start of the Course:

Understanding computer programming, compilation, program memory management, data structures, and basic algorithms.

Expected Knowledge Gained at the End of the Course:

Students are expected to understand the basis of computer security, including ethics and policies, the foundation of robust programming, different types of vulnerabilities, and the basis of penetration testing.

Textbook

Computer Security; Art and Science by Matt Bishop. 2nd Edition. Published by Pearson. ISBN 978-0-321-71233-2. *(required)*.

Other materials can be assigned for specific topics.

Topics

- Security Fundamentals.
- Ethics, Laws, Policies, and Compliance.
- Robust Programming and Design Principles.
- Cryptography.
- Vulnerabilities.
- Penetration Testing.
- Reconnaissance and Social Engineering.
- Network Security.
- Identity and Anonymity.

Course Schedule

The following schedule is tentative. However, we will adhere to it as much as possible.

Class Schedule for CSCY 3740 - Fall 2023

Week #	Topic to be Covered	Assigned Readings	Assessments
1	Aug-22 - Aug-24 Course Presentation, Security Fundamentals	Ch. 1	Hw1 Post
2	Aug-29 - Aug-31 Ethics, Laws, Policies and Compliance. Standards.	Addt. Material	
3	Sep-05 - Sep-07 Design Principles and Robust Programming	Ch. 14 / 31.1 - 31.4	Hw1 Due Hw2 Post
4	Sep-12 - Sep-14 Policy Models	4.1-4.6 / 5.1-5.3 / 6.1-6.2 / 6.4-6.5	
5	Sep-19 - Sep-21 Networks and Cryptography	Ch. 10	Lab 1: Robust Prog.
6	Sep-26 - Sep-28 Protocols and authentication	11.1 / 12.1 / 12.4-12.5 / 13	Hw2 Due Hw3 Post
7	Oct-03 - Oct-05 Confinement problem, vulnerabilities	18.1-18.2 / 24.3-24.4	Lab 2: Network
8	Oct-10 - Oct-12 Midterm Exam Malware	23.1-23.7 / 23.9	MidTerm Exam
9	Oct-17 - Oct-19 Malware		Lab 3: Crypto & Auth.
10	Oct-24 - Oct-26 Penetration Testing	24.1-24.2	Hw3 Due
11	Oct-31 - Nov-02 Penetration Testing		
12	Nov-07 - Nov-09 Reconnaissance, Footprinting, Social Engineering, Insider Threats	Addt. Material	Hw4 Post
13	Nov-14 - Nov-16 Network Security, firewalls, intrusion detection	Ch. 26 and 28	Lab 4: Pen. Test.
14	Nov-21 - Nov-23	Fall Break - No Class	
15	Nov-28 - Nov-30 Identity, anonymity, Onion routing, ACL	Ch. 15	
16	Dec-05 - Dec-07 Information Flow	17.1 / 17.3-17.6	Hw4 Due
17	Dec-12 - Dec-14	Final Weeks. Final Date TBD	

Assigned readings **must** be completed before the lecture.

Grading Policies

Grades will be recorded on Canvas. You can check on Canvas for all your assignments' current grades. After grades are posted on Canvas, you will have one week to meet with the instructor/TA to clarify any corrections or incorrect grades. After that week, no changes will be made.

Course grades are a weighted average of the grades earned on all graded material. The weights for the different categories are:

Participation	10%
Homework	20%
Labs	30%
Exams	40%

Letter grades will be assigned as follows:

0	F	60	61	D-	63	64	D	66	67	D+	69	70	C-	73	74	C	76	77	C+	79	80	B-	83	84	B	86	87	B+	89	90	A-	93	94	A	100
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This course will have the following assessments:

- **Homework:** There are four homework assignments to be completed alone. Homework will provide additional practice and reflection on specific topics.
- **Labs:** There are four labs to be completed during class sessions. Each lab will develop a particular topic. Labs will be completed in teams of two students, and students must prepare in advance. Labs can include using cloud environments, application development, etc.
- **Exams:** There are two exams: a midterm and a final (comprehensive) exam. Both exams will have the same weight on the final grade.
- **Participation:** Attendance and participation are required for this course. Being on time is essential, and students arriving at most five minutes late will not be marked as present for that class period. Students who miss more than four periods (excused or not) will not receive participation credits for the semester. Being actively engaged in the class by asking and answering questions, participating in discussions, completing assigned tasks, etc., is expected in this course. We will inform students when they are in a low participation rhythm so that they can improve it. Otherwise, they will not receive participation credits, even with perfect attendance. Completing the assigned readings before class is crucial for developing good participation skills.

Course Procedures

Incomplete Grade: The current university policy concerning incomplete grades will be followed in this course. A grade of Incomplete will only be considered when unexpected emergencies prevent a student from completing the course. Unfinished work must be finished by the end of the subsequent semester, or the “I” will automatically be recorded as an “F” on your transcript.

Canvas: We will be using Canvas in this course to assign all the coursework, communicate class-wide announcements, and record grades. So, you should check it frequently.

Individual Communication: Students should rely **only on the University email system** (Outlook) to communicate with the instructors. If you need to contact us, please **email us**. Do NOT use Canvas messages. Your instructor's email is listed at the beginning of this document. Include **CSCI3740** in the subject line for a quicker response (usually within 24-48 hours on weekdays). However, to discuss exercises/problems, please schedule an appointment with your instructor (see office hours on the first page); we usually cannot answer those questions over email.

Classroom Devices: Out of respect for everyone in the classroom, you must first receive my approval if you would like to record the lectures. I generally will approve the request, but I first would like to speak with you concerning the scope of the recording. **The use of electronic devices is otherwise NOT permitted.**

Student Expectations

Civility: Our commitment is to create a climate for learning characterized by respect for each other and each person's contributions to the class. We ask for a similar commitment from our students.

Professionalism: Since mobile devices can be a distraction during class, I ask that all devices be put into “silent” mode and not utilized during class; this includes checking Facebook, sending a Tweet, or checking email. If the instructor feels your mobile device distracts other students, you, or the instructor themselves, you will be asked to leave the classroom.

Religious Observations: We understand that an individual’s religion plays a large part in their life, and we want this course to interfere with those as little as possible. If you find that your religion’s holiday(s) falls on a class day and you cannot attend due to this, **please email the instructor two weeks in advance of the holiday’s date**. We will work together to try to accommodate; however, note that this accommodation may not be possible in some cases, like on exams.

Collaboration and Cheating

We encourage you to review material and discuss ideas with other students, and work on problems you encounter. Discussions often help clarify problems and resolve difficulties — feel free to take advantage of this to improve your understanding of the material, but make sure you **create your own work**. It’s vital that you go through the program design, coding, and debugging processes yourself, or you will not be developing your programming skills and understanding.

AI-generated solutions should be documented appropriately, showing what you used from a tool and how the student correctly extended that. Failing to do so will be considered cheating (not the student’s work). Please, meet with your instructor before using any of these tools to discuss how you plan to use them. AI tools, like ChatGPT and others, are generally **not allowed** in this course. However, its usage must be permitted for particular assessments, and in that case, it must be adequately disclosed, and the student's contribution must be clear. Otherwise, it may be considered dishonesty and fall under the purview of plagiarism. Students should check the restrictions for each assessment and contact the instructor if they need clarification.

Please see your instructor if you have any questions about what this means.

We reserve the right to use automated similarity metrics to detect plagiarism in this course.

All students must create their work on their own!

Any instances of cheating will result in a zero for the assignment, a grade of zero (an “F”) in the course, or sanctions determined by the college (including suspension and expulsion).

Sharing solutions (whole or partial) is not allowed and is considered plagiarism. Using somebody else’s solution as your own is also considered plagiarism. This includes taking someone else’s solution with or without their permission or asking a third party (like a tutor) for the answer.

If you need help, visit your instructor’s or TA’s office hours.

All students must adhere to the [College of Engineering, Design, and Computing - Student Honor Code](#).

University Policies

Access: The University of Colorado Denver is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students with disabilities who want academic accommodations must register with Disability Resources and Services (DRS) in Student Commons Building, Suite 2116, Phone: 303-315-3510, TTY: 303-556-4766, Fax: 303-315-5315. I will happily provide approved accommodations once you provide me with a copy of DRS's letter. DRS requires students to provide current and adequate documentation of their disabilities. Once a student has registered with DRS, DRS will review the documentation and assess the student's request for academic accommodations in light of the documentation. DRS will then provide the student with a letter indicating which academic accommodations have been approved.

Academic Honesty and Student Code of Conduct: Students are expected to know, understand, and comply with the ethical standards of the university and the college, including rules against plagiarism, cheating, fabrication and falsification, multiple submissions, misuse of academic materials, and complicity in academic dishonesty. For more information on Academic Honesty and the Student Code of Conduct, please see:

<https://www.ucdenver.edu/student/health-wellness/student-conduct>

Mental Health Resources:

CU Denver faculty and staff understand the stress and pressure of college life. Students experiencing symptoms of anxiety, depression, substance use, loneliness or other issues affecting their mental well-being, have access to campus support services such as the [Student and Community Counseling Center](#), the [Wellness Center](#), and the [Office of Case Management](#). Students also have access to the [You@CUDenver](#) on-line well-being platform available 24/7. More information about mental health education and resources can be found at [Lynx Central](#) and CU Denver's [Health & Wellness](#) page. Students in imminent crisis can contact [Colorado Crisis Services for immediate assistance](#) 24/7 or walk-in to the counseling center during regular business hours.

Last updated on August 08, 2023.