

CSCI 4250/6250 Cyber Security

Department of Computer Science

Fall 2021

Instructor: Mustakimur Rahman Khandaker.

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Office Hours: Monday and Thursday 12:00 PM - 01:00 PM or by appointment.

Lecture time and location:

Monday 10:20 am - 11:10 am Boyd Grad Rsch Ctr 0306

Tuesday/Thursday 9:35 am - 10:50 am Hardman Hall 0101

Teaching Assistant:

N/A

Textbooks (recommended): Wenliang Du, Computer & Internet Security: A hands-on Approach, 2nd edition, May 2019.

Prerequisite:

- CSCI 4730/6730 (Operating Systems) or CSCI 4760/6760 (Computer Networks).

Course Objective: The general course objectives are to detect vulnerabilities, identify attacks, and protect proprietary systems and data across different cybersecurity fields.

Course Description: This course will cover the basic security issues across different areas and state-of-the-art solutions to protect intellectual property.

Week 1: Syllabus, Security, and Principles.

Week 2-5: Software attacks.

Week 6-7: Software protection mechanism.

Week 7-9: Software bug detection.

Week 9-10: Cryptography.

Week 10-12: Web security.

Week 13: Mobile security.

Week 13-14: Network security and protocols.

Week 15: Hardware, IoT, and CPS security.

Week 16: Virtualization and TEE.

Week 17: Machine learning adversaries and Privacy.

Evaluation and Grading Policy:

- Quiz: 10% (5 quizzes).
 - Software attacks (week 5).
 - Software defense mechanism (week 8).
 - Software bug detection and cryptography (week 11).
 - Web security, and Mobile security (week 14).
 - Network security and protocols; Hardware, IoT, CPS security (week 16).
- Homeworks: 20% (4 HW).
 - Software vulnerability analysis (week 5).
 - Shellcoding (week 7).
 - Hands-on cryptography (week 11).
 - Paper review on fuzzing (week 15).
- Projects: 40% (total 4).
 - Buffer overflow (week 5).
 - Return-to-Libc (week 8).
 - Format string (week 11).
 - Cross-Site Scripting (week 14).
- Midterm: 15%.
 - 100% (week 1-9).
- Final: 15%.
 - 40% (week 1-9).
 - 60% (week 9-17).

Letter Grade Assignment:

Letter Grade	Percentage
A	91 - 100%
A-	86 - 90%
B+	81 - 85%
B	76 - 80%
B-	71 - 75%
C+	66 - 70%
C	61 - 65%
C-	56 - 60%
D	51 - 55%
F	0 - 50%

Instruction Policy:

- Course instructions will be (hopefully) in person.
 - Instruction policy depends on the UGA plan.
- Monday class will be mostly used as a lab section.
 - Showcase how to use a debugger, fuzzing tools, write compiler instrumentation and packet analysis.
 - Also, general discussion on project assignments.

Projects:

Assignments will be based on SEED Lab ([SEED Project](#)).

- Submit source code and malicious input.
- Submit a report detailing the process to exploit.

Homework/Project Policy:

- The homework will due at the start of the class on the specified day.
 - Submit digital copy on the eLC course page.
- The project will due on at Sunday 11:59 PM on the specific day.
 - Submit digital copy on the eLC course page.
- Late submission will receive a 3% penalty for each day (maximum 3 days allowed).

Quiz/Exam Policy:

- The quiz will be online at class time (@ Monday class).
- The quiz and exam dates will be announced at least a week in advance.
 - The final exam will be scheduled as UGA policy.
- The exam will be paper-based (unless UGA changes policy).
 - Absences from the exam will not be permitted.

Academic Honesty:

- Each student is expected to do his/her own work.
 - Teamwork is not allowed unless explicitly specified.
- Acknowledge all sources of information you have used/referred to in your assignments outside the textbook.
- Students are expected to familiarize themselves with the academic honesty policy of the University of Georgia: <https://ovpi.uga.edu/academic-honesty>.

Accommodations due to a disability:

If you plan to request accommodations for a disability, please register with the Disability Resource Center (DRC). The DRC can be reached by visiting Clark Howell Hall, by calling 706-542-8719 (voice) or 706-542-8778 (TTY), or by visiting <http://drc.uga.edu>.

Mental Health and Wellness Resources:

- If you or someone you know needs assistance, you are encouraged to contact Student Care and Outreach in the Division of Student Affairs at 706-542-7774 or visit <https://sco.uga.edu/>. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services.
- UGA has several resources for a student seeking mental health services (<https://www.uhs.uga.edu/bewelluga/bewelluga>) or crisis support (<https://www.uhs.uga.edu/info/emergencies>).
- If you need help managing stress anxiety, relationships, etc., please visit BeWellUGA (<https://www.uhs.uga.edu/bewelluga/bewelluga>) for a list of FREE workshops, classes, mentoring, and health coaching led by licensed clinicians and health educators in the University Health Center.
- Additional resources can be accessed through the UGA App.