



SCHOOL OF COMPUTER SCIENCE

SEMESTER:	FALL 2022
COURSE:	CIS*4510: COMPUTER SECURITY FOUNDATIONS
PREREQUISITES:	CIS*3210: Computer Networks
PROF:	Hassan Khan
LECTURES:	T/Th 11:30 AM-12:50 PM
CLASS VENUE:	CRSC, 117 LEC
LAB:	None
GRAD. TAs:	
CREDIT UNIT:	0.5 CREDIT HOURS
OFFICE HOURS:	Th 10:30 AM-11:30 AM
CONTACTS:	hassan.khan@uoguelph.ca

Calendar Description:

This course covers basic concepts and practices in computer and network security. The topics covered include adversarial modeling, threat modeling, risk assessment, security policies, cryptographic building blocks, identity and access management, operating systems security, software security, malicious software, network security, web security, firewalls, tunnels and intrusion detection systems.

Course Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Identify computer and network security threats, classify the threats, and develop a security model to prevent, detect and recover from the attacks.
2. Understand and apply cryptographic building blocks to build secure systems
3. Understand and apply operating system, software, and web security controls to build secure distributed systems.
4. Develop SSL or Firewall based solutions against security threats, employ access control techniques to the existing computer platforms.
5. Use tools to perform penetration testing and Ethical Hacking to identify vulnerabilities in a computer system.
6. Determine how to patch the vulnerabilities in #3.
7. Present a novel security product or paper and identify possible improvements.

Textbooks & Materials:

1. **Computer Security and the Internet: Tools and Jewels**, 1st Edition (will be available online for free), Paul C. van Oorschot. (2019).

Recommended Reference Material:

1. **Security Engineering: A Guide to Build Dependable Distributed Systems**, 3rd Edition (available online for free), Ross Anderson. Wiley, ISBN: 978-1119642787 (2020).

Weekly Activity:

WEEK	Topics	Activities	Aids/ References
<i>Week 1</i>	Introduction to Computer Security	Assignment 1	Computer Security and the Internet: Chapter 1 (Sections 1.1-1.7)
<i>Weeks 2-3</i>	Cryptographic Building Blocks		Computer Security and the Internet: Chapter 1 (Sections 2.1-2.6)
<i>Week 4</i>	Identity and Access Management	Assignment 2	Computer Security and the Internet: Chapter 1 (Sections 3.1-3.5)
<i>Week 5</i>	Operating System		Computer Security and the Internet: Chapter 5 (Sections 5.1-5.3, 5.7)
<i>Week 6</i>	Software Security I	Midterm Presentation Topic due Assignment 3	Computer Security and the Internet: Chapter 6 (Sections 6.1-6.3, 6.6)
<i>Week 7</i>	Malicious Software		Computer Security and the Internet: Chapter 7 (Sections 7.1-7.6)
<i>Week 8</i>	Network Security		Computer Security and the Internet: Chapter 11 (Sections 11.2-11.4)
<i>Week 9</i>	Firewall, Tunnels and IDS		Computer Security and the Internet: Chapter 10 (Sections 10.1-10.4, 11.1)
<i>Weeks 10-11</i>	Web Security		Computer Security and the Internet: Chapter 9 (Sections 9.1-9.5, 9.5)
<i>Week 12</i>	Class Presentation		
FINAL EXAM			

Teaching Methodology:

The course will be conducted through lectures, class discussions, and practical lab exercises. Lab-reports are due one week after the labs.

Class Policy:

- Be courteous to your classmates by avoiding any actions that may cause disruption.

Course Evaluation:

Assignments	45 % (3 x 15%)
Mid-term	20 %
Final Exam	25 %
Lab presentation	10%

E-mail Communication

As per university regulations, all students are required to check their <mail.uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The regulations and procedures for course registration are available in their respective Academic Calendars.

Copies of out-of-class assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day. More information: www.uoguelph.ca/sas

Academic Misconduct

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community, faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it.

Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar.

Recording of Materials

Presentations which are made in relation to course work, including lectures, cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

Resources

The Academic Calendars are the source of information about the University of Guelph procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.