



THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS/GACS-3921/4921-001

Course Name: Computer Security and Privacy

Instructor Information

Professor: Talal Halabi

E-mail: t.halabi@uwinnipeg.ca

Office Hours: Friday: 8:30 - 9:30 am (Only via appointments over Zoom)

Class Meeting Time: Tuesday & Thursday: 8:30 – 9:45 am (Live via Zoom)

Course Web Page: <https://nexus.uwinnipeg.ca/d2l/home/39868>

Important Dates

First Class: September 7, 2021

Reading Week (No Classes): October 10 - 16, 2021

Midterm Exam: October 28, 2021

Final Withdrawal Date w/o academic penalty: November 16, 2021

(A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date)

Last Class: December 8, 2021

Final Exam: TBD

Make-up classes will be held on December 7 and 8, 2021

University closures: Truth and Reconciliation Day Thursday, September 30, 2021

Thanksgiving Day Monday, October 11, 2021

Remembrance Day Thursday, November 11, 2021

Course Objectives/Learning Outcomes

This course introduces students to the security and privacy issues in computer and network systems and related technologies. It covers the fundamentals of computer security such as encryption methods, public key cryptography, hash function and signature schemes, key exchange protocols, authentication and access control models, malicious software, system and network security. The course also examines issues related to the management of IT security like

risk assessment, security controls, security audits, privacy and ethics. ACS-4921 students will also read and analyze scientific papers on topics related to computer security and privacy.

Remote Learning

Course material including lecture notes, slides, and assignments will be available on Nexus. Class notices will be posted on Nexus. Students are also responsible for material covered in class and announcements made in class.

Students must be available via Zoom during the lecture times.

- Students must display their real/full name
- Use of Video is optional but strongly encouraged
- Participants must be muted when not speaking
- Students may interact via chat, voice or gestures

Students can find answers to frequently asked questions related to remote learning here: <https://www.uwinnipeg.ca/covid-19/remote-learning-faq.html>.

Note: a permitted or necessary change in mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.

Evaluation Criteria For ACS-3921 Students

Assignments: 30%

- There will be 3 theoretical/technical assignments worth 10% each.
- Due at 11:59:59 pm on due day.
- No late assignment will be accepted, or under special circumstances accepted with 20% off for each late day.
- Assignments are only submitted electronically via Nexus as PDF files.
- Multiple submissions are not permitted. Students may submit a partially completed assignment and will receive credit for those attempted problems.
- Assignments will be done by a group of two students. Only one of the group members submits the assignment, in which the names of both students should appear.
- Assignments must be typed. No handwritten assignments will be accepted.

Midterm Exam: 30%

- Open-book online midterm exam.

Final Exam: 40%

- Open-book online final exam.
- The final exam is comprehensive and covers all materials discussed in the course.

Evaluation Criteria For ACS/GACS-4921 Students

Assignments: 30%

- There will be 3 theoretical/technical assignments worth 7% each.
- There will be one extra assignment worth 9% involving scientific reading and analysis.
- Due at 11:59:59 pm on due day.
- No late assignment will be accepted, or under special circumstances accepted with 20% off for each late day.
- Assignments are only submitted electronically via Nexus as PDF files.
- Multiple submissions are not permitted. Students may submit a partially completed assignment and will receive credit for those attempted problems.
- Assignments will be done by a group of two students. Only one of the group members submits the assignment, in which the names of both students should appear.
- Assignments must be typed. No handwritten assignments will be accepted.

Midterm Exam: 30%

- Open-book online midterm exam.

Final Exam: 40%

- Open-book online final exam.
- The final exam is comprehensive and covers all materials discussed in the course.

Test / Exam Requirements

- Photo ID is required for the final exam
- Midterm and final exams will be delivered via Nexus. Students must have video capability and be prepared to present their student ID
- Midterm and final exams are open book. However, students are permitted to view **only** the following authorized course material:
 - Class notes, slides, and assignment descriptions and solutions
 - Course textbook
 - Student's own course notes and assignment submissions
- Students may use an external tool such as a text editor or IDE to write answers to questions before entering them into the exam
- Students may contact the instructor to ask questions during the exam
- External resources (or any material not listed above) are NOT PERMITTED
- Communication with others (except the instructor) is NOT PERMITTED
- All work must be entirely the students' own. Collaboration or sharing of work is NOT PERMITTED
- You are expected to write the test/exam on its given day. Unless a medical certificate is provided, no accommodation is made for missed exams.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work or examinations without penalty. A list of religious holidays can be found in the 2021-22 Undergraduate Academic Calendar.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams or during lectures/laboratories are encouraged to contact Accessibility Services (AS) at 204.786.9771 or <https://www.uwinnipeg.ca/accessibility-services/> to discuss appropriate options. All information about a student's disability or medical condition remains confidential.

Final Letter Grade Assignment

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

A+	90+ - 100%	B+	75 - 79%	C	60 - 64%
A	85 - 90%	B	70 - 74%	D	50 - 59%
A-	80 - 84%	C+	65 - 69%	F	below 50%

Prerequisite and Restriction Information*

(This information can be found in the UW General calendar)

- Grade of at least C in both ACS-2906(3) and ACS-2947(3) or permission of Department Chair.
- Restrictions: Students who have taken ACS-3921 will not be eligible to take ACS-4921.

*Make sure that you have the necessary prerequisites to take this course. If you have not successfully completed the above listed course(s), it is in your interest to go to student registration office and officially drop the course.

Class Cancellation, Students Correspondence, and Withdrawing from Course

- When it is necessary to cancel a class due to exceptional circumstances, the course instructor will make every effort to inform students via uwinnipeg email and Nexus.
- Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or the course instructor.
 - It is recommended that electronic communication used for the course utilize a UofW email account or the Nexus platform to minimize the risk of filtering. Use 'ACS-3921/4921' as subject in email communication.
- Please let course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.

Regulations, Policies, and Academic Integrity

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

Avoiding Academic Misconduct: Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:

<https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>

Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>
- UW Library video tutorial "Avoiding Plagiarism"
<https://www.youtube.com/watch?v=UvFdxRU9a8g>

Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.

Non-academic misconduct. Students are expected to conduct themselves in a respectful manner on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies could be considered "non-academic" misconduct. More detailed information can be found here:

- Respectful Working and Learning Environment Policy
<https://www.uwinnipeg.ca/respect/respect-policy.html>,
- Acceptable Use of Information Technology Policy
<https://www.uwinnipeg.ca/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf>
- Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>.

Copyright and Intellectual Property. Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the

instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor's intellectual property rights could face serious consequences pursuant to the Academic Misconduct or Non-Academic Misconduct Policy; such consequences could possibly involve legal sanction under the Copyright Policy

https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf

Privacy. Students have rights in relation of the collecting of personal data the University of Winnipeg: <https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html>.

- Zoom and Privacy: <https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html>
- Testing/Proctoring: <https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html>.

Required Text Book(s)

Computer Security: Principles and Practice
William Stallings & Lawrie Brown
4th Edition, 2018
Pearson Education, Inc.
ISBN-13: 978-0-13-479410-5/ ISBN-10: 0-13-479410-9

Course Outline (Tentative)

Computer Security Technology and Principles

Cryptographic Tools
User Authentication
Access Control
Database Security
Malicious Software
Denial of Services Attacks
Intrusion Detection and Prevention Systems/ Firewalls
Wireless Network Security

Software and System Security

Software and Operating system Security
Cloud Computing and Internet of Things Security

IT Security Management Issues

IT Security Management and Risk Assessment
IT Security Controls, Plans, and Procedures
Security Auditing

Note: All topics listed may not be covered and may be offered in a slightly different time order.