



THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

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

Course Name: Computer Security and Privacy

Instructor Information

Professor: Talal Halabi

Office: 3D19

E-mail: t.halabi@uwinnipeg.ca

Office Hours: Tue: 10:30 - 12:30

Class Meeting Time: Mon & Wed: 11:30 – 12:45

Room No: 3D01

Course Web Page: <https://sites.google.com/view/talalhalabi/teaching/acs-3921/4921>

Important Dates

First Class:

Sep 4th, 2019

Midterm Exam:

October 23rd, 2019

Reading Week (No Classes):

October 13th – Oct 19th, 2019

Final Withdrawal Date w/o academic penalty: Nov 12th, 2019

(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:

Dec 3rd, 2019

Submission of reports:

Dec 1st, 2019

Presentations:

Dec 2nd and 3rd, 2019

Final Exam:

Dec 16th, 2019

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 undertake a comprehensive case study on a topic related to computer security and privacy.

Evaluation Criteria For ACS-3921 Students

Assignments: 30%

- There will be 3 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 by email as PDF (Portable Document Format) files to my University of Winnipeg email account – t.halabi@uwinnipeg.ca.
- Multiple submissions are not permitted. Students may submit a partially completed assignment, and will receive credit for those attempted problems.
- Assignments may be done by a group of two students. In this case, only one of the group members submits the assignment, in which the names of both students should appear.

Midterm Exam: 20%

- Closed-book in-class midterm exam.

Final Exam: 50%

- Closed-book final exam.
- The final exam covers all material discussed in the course.

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%

Evaluation Criteria For ACS-4921 and GACS-4921 Students

Assignments: 30%

- There will be 3 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 by email as PDF (Portable Document Format) files to my University of Winnipeg email account – t.halabi@uwinnipeg.ca.
- Multiple submissions are not permitted. Students may submit a partially completed assignment, and will receive credit for those attempted problems.

- Assignments may be done by a group of two students. In this case, 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: 20%

- Closed-book in-class midterm exam.

Case Study (15%)

- Students will be required to do a comprehensive case study. Topics will be related to computer security and privacy.
- The case study will involve reading scientific articles from the literature and providing a theoretical report that answers a set of analytical questions, with suggestions for further work.
- Depending on the class size, students maybe assign into groups, and then the case study will be done as a group project. In this case, there will be additional evaluation criteria on each individual student on their contribution to the overall project in the group.
- Topics on case study to be determined at class.
- Case study will be evaluated based on thoroughness of the research, the level of details in the findings, lessons learned, the level of understanding of the students, and the quality of the presentation. For group projects, individual contribution will be part of the evaluation (more details will be provided in class and on the course website).
- Case study will consist of a term report (up to five pages) and only submitted by email as PDF (Portable Document Format) files to my University of Winnipeg email account – t.halabi@uwinnipeg.ca on the due day no later than 11:59:59 pm.
- Students will be required to present the studied scientific paper and the findings of their case study in class at the end of term.

Final Exam: 35%

- Closed-book final exam.
- The final exam covers all material discussed in the course.

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%

Test/Exam Requirements

- Photo ID at exam is required.

- You are expected to write the test/exam on its given day.
- No electronic devices (e.g. cell/smart phone, laptop, scientific calculators, translators, etc.) are permitted.
- Midterm and final exams are closed-book.
- Simple calculators can be used though. Simple calculators are subjected to test and can be denied use at mid-term test and final examination times.
- Unless a medical certificate is provided, no accommodation is made for missed exams.

Prerequisite and Restriction Information*

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

- A grade of at least C in both ACS-2906(3) and ACS-2947(3), or permission of the 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.

Email Communication Requirements

- Emails from accounts at uwinnipeg.ca are usually not filtered by the UofW email filter. Thereby it is recommended electronic communication used for the course utilize a UofW email account to minimize the risk of filtering.
- Use 'ACS-3921/4921' as subject in email communication related to the course.

Services for Students

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential:

<http://www.uwinnipeg.ca/accessibility>.

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 examinations without penalty. A list of religious holidays can be found in the 2018-19 Undergraduate Academic Calendar.

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at www.uwinnipeg.ca/respect .

Misuse of Computer Facilities, Plagiarism, and Cheating

Avoiding Academic and Non-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/institutionalanalysis/docs/policies/academic-misconduct-policy.pdf>

and

<https://www.uwinnipeg.ca/institutionalanalysis/docs/policies/academic-misconduct-procedures.pdf>

Non-Academic Misconduct Policy and Procedures:

<https://www.uwinnipeg.ca/institutionalanalysis/docs/student-non-academic-misconduct-policy.pdf>

and

<https://www.uwinnipeg.ca/institutionalanalysis/docs/student-non-academic-misconduct-procedures.pdf>

Additional information is available at University of Winnipeg library video tutorial “Avoiding Plagiarism” <https://www.youtube.com/watch?v=UvFdxRU9a8g>

Misuse of Filesharing Sites. 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.

Avoiding Copyright Violation. Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. 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 photographing or recording slides, presentations, lectures, and notes on the board.

Required Text Book(s)/Reading List

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

Class notes and notices will be posted on the course website. Students are responsible for material covered in class and announcements made in class.

Course Outline (Tentative)

Computer Security Technology and Principles

- Cryptographic Tools
- User Authentication
- Access Control
- Database and Data Centre Security
- Malicious Software
- Denial of Services Attacks
- Intrusion Detection
- Firewall and Intrusion Prevention System
- Wireless Network Security

Software and System Security

- Software Security
- Operating system Security
- Cloud and IoT Security

IT Security Management Issues

- IT Security Management and Risk Assessment
- IT Security Controls, Plans, and Procedures
- Security Auditing
- Legal and Ethical Aspects

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

Additional Course Related Information

1. When it is necessary to cancel a class due to exceptional circumstances, instructors will make every effort to inform students via uwinnipeg email (and/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms
2. Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses (and/or using the preferred form of communication, as designated in this outline) to ensure timely receipt of correspondence from the university and/or their course instructors

3. Please note that withdrawing before the VW date does not necessarily result in a fee refund (November 12 is VW date for classes that begin in September and end in December).
4. The class on December 3rd is the make-up class for Remembrance Day.
5. No classes:
 - October 14th, 2019 Thanksgiving
 - October 13th-19th, 2019 Mid-term reading week
 - November 11th, 2019 Remembrance Day
 - December 22nd, 2019 - January 2nd, 2020 University closed