THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: **ACS-3921-001 / ACS/GACS-4921-001, 070L, 071L**
Course Name: **Computer Security and Privacy**
Course Webpage: **https://nexus.uwinnipeg.ca/d2l/home/67579**

Instructor Information

Instructor: Victor Balogun
E-mail: vi.balogun@uwinnipeg.ca
Office Hours: Thursday   12:00pm – 1:00 pm   **3D18**
Class meeting time: Mon/Wed   4:00 PM - 5:15 PM   **3D01**
Lab time: 070L   Wednesday   8:30 am – 9:30 am   3C13
             071L   Thursday   8:30 am – 9:30 am   3C13

Important Dates

1. First Class: Monday, January 6, 2025

2. Reading Week (no classes):   February 16 – 22, 2025

3. Midterm Exam: Monday, February 24, 2025

4. Final Withdrawal Date w/o academic penalty*: Friday, March 14, 2025

5. Last Class: Wednesday, April 2, 2025

6. Final Exam (Comprehensive):   Date **TBD**

7. University closures: Louis Riel Day   Monday, February 17, 2025
                          Good Friday   Friday, April 18, 2025

*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.

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/GACS-4921 students will also read and analyze scientific papers on topics related to computer security and privacy.

Evaluation Criteria For ACS-3921 Students

Note: **The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the following assessments***:*

1. **Labs (20%)**
   - Based on 10 labs, worth 2% each
   - Labs are to be completed during the lab period
   - No late lab submissions will be accepted

2. **Quizzes (3 quizzes, to be done in class. Each quiz worth 4%) 12%**

3. **Midterm Exam** (**18%**) – *Monday, February 24, 2025*
   - During the regular class time
   - Missed exams will receive a mark of zero, unless a medical certificate is provided, no accommodation is made for missed exams.

4. **Group Discussion and Reflection (10%):**
   - It takes place during weekly classes
   - Instructor will provide topics of discussion
   - Students will discuss in random groups and reflect on Nexus.

5. **Final Exam (40%) -** Date **TBD**
   - Cumulative
   - Students should contact the instructor as soon as possible if extenuating circumstances require missing an assignment, test or examination. A medical certificate from a practicing physician may be required before any accommodation is considered.
   - Students are responsible for backing up and protecting their assignments.
   - Keep a backup copy of all class work in case there is an error in recording of marks by the instructor.

Evaluation Criteria For ACS-4921 Students

Note: **The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the following assessments***:*

1. **Labs (20%)**
   - Based on 10 labs, worth 2% each
   - Labs are to be completed during the lab period
   - No late lab submissions will be accepted

2. **Quizzes (3 quizzes, to be done in class. Each quiz worths 4%) 12%**

3. **Midterm Exam** (**15%**) – *Monday, February 24, 2025*
    *   During the regular class time
    *   Missed exams will receive a mark of zero, unless a medical certificate is provided, no accommodation is made for missed exams.

4. **Group Discussion and Reflection (10%):**
    *   It takes place during weekly classes
    *   Instructor will provide topics of discussion
    *   Students will discuss in random groups and reflect on Nexus.

5. **Cyber Security Capstone Project** – **10%.**
    Note: This component is compulsory for students that registered for ACS-4921. A grade of Incomplete will be assigned to any student that fails to complete this assessment.

6. **Final Exam (33%) -** Date **TBD**
    *   Cumulative
    *   Students should contact the instructor as soon as possible if extenuating circumstances require missing an assignment, test or examination. A medical certificate from a practicing physician may be required before any accommodation is considered.
    *   Students are responsible for backing up and protecting their assignments.
    *   Keep a backup copy of all class work in case there is an error in recording of marks by the instructor.

Evaluation Criteria For GACS-4921 Students

Note: **The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the following assessments***:*

1. **Weekly Cyber Security Hands On (15%)**
    -   Based on 10 Hands Ons, worth 1.5% each
    -   To be completed during the weekly meeting period

2. **Quizzes (3 quizzes, to be done in class. Each quiz worths 4%) 12%**

3. **Midterm Exam** (**15%**) – *Monday, February 24, 2025*
    *   During the regular class time
    *   Missed exams will receive a mark of zero, unless a medical certificate is provided, no accommodation is made for missed exams.

4. **Group Discussion and Reflection (10%):**

- It takes place during weekly classes
- Instructor will provide topics of discussion
- Students will discuss in random groups and reflect on Nexus.

5. **Research/Term Paper** – **15%.**
   Note: This component is compulsory for students that registered for GACS-4921. A grade of Incomplete will be assigned to any student that fails to complete this assessment.

6. **Final Exam (33%) -** Date **TBD**
   - Cumulative
   - Students should contact the instructor as soon as possible if extenuating circumstances require missing an assignment, test or examination. A medical certificate from a practicing physician may be required before any accommodation is considered.
   - Students are responsible for backing up and protecting their assignments.
   - Keep a backup copy of all class work in case there is an error in recording of marks by the instructor.

Test / Exam Requirements

- Photo ID is required for mid-term exam and the final exam. Students must be prepared to present their student ID.
- Midterm might be delivered via Nexus and proctored via Respondus. Students must have video capability and video must be turned on for the duration of the exam for proctoring.
- The final exam will be delivered in-person at an examination venue to be determined.
- Midterm and final exams are **Closed** book.

Students should contact the instructor as soon as possible if extenuating circumstances require missing a lab, assignment, test or examination. A medical certificate from a practicing physician may be required before any adjustments are considered.

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 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
https://www.uwinnipeg.ca/accessibility-services

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 2024-25 Undergraduate Academic Calendar online at
http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf

- Since Respondus Proctoring tool products might be used to Proctor Nexus mid-term, please visit the following links for more information on Respondus:

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 – 89 %	B	70 – 74%	D	50 – 59%
A-	80 – 84%	C+	65 – 69%	F	below 50%

Required Text Book / Reading List

Computer Security: Principles and Practice
William Stallings & Lawrie Brown
5th Edition, 2023
Pearson Education, Inc.
ISBN-13: 9780138091712

Prerequisite Information

Prerequisites (for both ACS 3921 and ACS/GACS 4921):

(This information can be found in the UW Undergraduate Academic Calendar)
- ACS-2906 and ACS-2947 with a minimum grade of C, or permission of the Department Chair
- **Restrictions**: Students may not hold credit for this course and ACS-4921.

For **ACS 3921 and ACS 4921:** ACS-3921/4921L (lab) must be taken concurrently

Regulations, Policies, and Academic Integrity

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).

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

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures:
  https://www.uwinnipeg.ca/policies/docs/policies/academic-misconduct-policy.pdf and
  https://www.uwinnipeg.ca/policies/docs/procedures/academic-misconduct-procedures.pdf
- About Academic Integrity and Misconduct, Resources and FAQs:
  https://library.uwinnipeg.ca/use-the-library/help-with-research/academic-integrity.html

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.

Academic Integrity and AI Text-generating Tools: The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the assessments. Students will face an allegation of academic misconduct if using them to do assignments. In rare cases when the professor explicitly permit the use of AI tools, students must cite them. According to the MLA (https://style.mla.org/citing-generative-ai/), writers should

- Cite a generative AI tool whenever you paraphrase, quote, or incorporate into your own work any content (whether text, image, data, or other) that was created by it
- acknowledge all functional uses of the tool (like editing your prose or translating words) in a note, your text, or another suitable location
- take care to vet the secondary sources it cites

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/policies/docs/policies/acceptable-use-of-information-technology-policy.pdf
- Non-Academic Misconduct Policy and Procedures:
  https://www.uwinnipeg.ca/policies/docs/policies/student-non-academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/policies/docs/procedures/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/basics/copyright-policy.html

Privacy

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

Class Cancellation, Correspondence with Students 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.

Please let the 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.

Respondus Privacy and Security

The University of Winnipeg Information and Privacy Office has reviewed Respondus' privacy and security information. The Respondus Privacy Notice is posted on the University's website and can be viewed at: https://www.uwinnipeg.ca/privacy/respondus-privacy-notice.html

Topics to be covered (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: 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.