COMP 4580 Computer Security

1. General Information

- Instructor: Noman Mohammed
- Email:
- Lecture time and location:
- Office location:
- Office hours:
- Course website:

2. Course Description

- **Summary:** This course provides an introduction to security and privacy issues in various aspects of computing, including cryptography, software, operating systems, networks, databases, and Internet applications. It examines causes of security and privacy breaches, and gives methods to help prevent them.
- **Prerequisites:** COMP 3430 and COMP 3720 or COMP 3010

3. Course Schedule (*subject to change*)

Introduction
: Course logistics and overview; the meaning of computer security; confidentiality, integrity, and availability; types of threats and attacks; methods of defense

Cryptography
: Secret-key cryptography; public-key cryptography; cryptographic hash functions; digital signature schemes

Software Security
: Secure programs: non-malicious program errors, malicious code;

Operating System Security
: Access control: ACL, capabilities, mandatory and discretionary access control; design principles and protection mechanisms

Network Security
: Design principles of security protocols; authentication protocols; security mechanisms for Internet protocol layers; network threats; firewalls, intrusion detection systems

Web Security and Privacy
: The World Wide Web; attacks on clients; attacks on servers; privacy issues

Database Security and Privacy
: Overview of database security, privacy definitions

A Few Other Topics
: Security planning; risk analysis; physical security; legal and ethical issues

4. Textbook and Other Readings

- **Required Textbook**: None.
- **Recommended optional textbooks:**
  - *Introduction to Computer Security*, by Michael T. Goodrich and Roberto Tamassia. Addison Wesley, 2011.
  - *Security in Computing,* by Charles P. Pfleeger and Shari Lawrence Pfleeger. Prentice Hall, 4th edition, 2007.
  - *Understanding Cryptography,* by C. Paar and J. Pelzl. Springer, 2010.
  - *Network Security: Private Communication in a Public World*, by Charlie Kaufman, Radia Perlman, and Mike Speciner. Prentice Hall, 2nd edition 2002.
  - *Hacking: The Art of Exploitation***,** by Jon Erickson. No Starch Press, 2nd edition, 2008.
  - *Foundations of Security***,** by Neil Daswani, Christoph Kern, and Anita Kesavan**.** Apress, 2007**.**

5. Grading

- Assignments (3-5): 30%
- 2 Term Tests: 40%
- Research Paper: 30%

6. Administrative Policy

- There will be 3-5 assignments worth a total of 30% towards your final grade. The assignments may include both written and programming questions. At least one assignment will be returned to you prior to the VW deadline.
- There will be two term tests, scheduled as an in-class tests. Each test will contribute 20% to your final grade.
- Make-up test is possible only under a university-approved condition, such as sickness with a doctor's note. Other events such as a business travel are not excused. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.
- In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.
- Students are expected to attend every class and take notes. Materials may only be covered in class and not made available on the course note/website. Students are expected to read the assigned materials and to actively participate in class discussions.

7. Student Resources

A list of University governing documents pertaining to students can be found here.

Academic Recourses
Various academic resources are available to students including the Science and Technology Library and various departmental help centers.

Health & Mental Health Resources

Students with Health and/or Mental Health issues may seek advice and/or help from Student Counselling Center, Student Accessibility Services, and University Health Services.

Copyright and Intellectual Property Resources

Copyrights and intellectual property must be respected by all students. For more information, please refer to the copyright office.

Academic Integrity Resources

The Faculty of Science takes academic integrity very seriously. Any evidence of academic dishonesty on assignments, labs and/or tests will be forwarded to the appropriate authorities for potential disciplinary actions.

The University Student Discipline By-Law may be accessed at: http://umanitoba.ca/admin/governance/governing_documents/students/student_discipline.html . Information from the Faculty of Science regarding Cheating and Plagiarism can be found at http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html.

Respectful Behavior Resources

Students are expected to act in a respectful manner. Policies regarding respectful work and learning environment and sexual assault can be found here.

Final Examinations, Grades and Grade Appeals Resources

Final examination and grades policies can be found here. For more resources about examinations, see here.

Students wishing to appeal their term work grade can do so through the Registrar's office. A fee is charged for each appeal. More information can be found here.

To view your final examination, please check with the department offering the course for policies. More information can be found here.

To appeal your final grade, you can initiate the process at the Registrar's office. A fee will be charged for each appeal. See the Registrar's office for more information.

Limited Access and VW Resources

Students who fail or VW from a course will be subject to limited access to that course in future terms. That is, students will not be able to register for a course (for which they have VWed or failed) during the limited access registration period. For more information, please see the policy document for repeated courses.