

GLIS 692 Data Security (3 credits)

1. Course Description

- Introduction to data security. Topics include basic concepts of confidentiality, integrity, and availability; security threats; access control; cryptography (encryption, decryption, passwords and digital signature); malware (viruses, trojan horses, worms, botnets, etc.); operating systems security; network security; security policies and practices; risk assessments; privacy threats and protection techniques; cybercrime and cyber forensics.
- Prerequisite: GLIS 617 – Information System Design

2. Learning Outcomes

By the end of the course, students will be able to:

- explain the fundamental concepts of data security: confidentiality, integrity, and availability (CIA)
- identify the major physical and cyber security threats faced by organizations today
- understand the technical aspects of access control, encryption and decryption, and digital signatures.
- classify different types of malware and describe their basic mechanisms
- explain the purpose of some commonly used security techniques, including firewalls, anti-virus software, vulnerability analysis tools, etc., and utilize some of the off-the-shelf security software tools.
- perform threat and risk assessments
- assess and develop security policies for an organization
- understand the fundamental principles of cyber forensics

3. Textbook , Lecture Notes and Articles

- Optional textbook: Introduction to Computer Security, by Michael Goodrich and Roberto Tamassia, Addison Wesley, 2011. ISBN-10: 0321512944 and ISBN-13: 9780321512949
- Lecture notes: Powerpoint slides provided by the instructor.
- Sandhu, Ravi S., and Samarati, Pierangela. “Authentication, Access Control, and Intrusion Detection.” Web. 1996.
- CERT-UK “An introduction to Malware.” Web. 2014.
- National Institute of Standards and Technology Special Publications 800-30, Revision 1, “Guide for Conducting Risk Assessments.” September 2012.

4. Evaluation (tentative)

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| 1. (In-class) exercises & presentations: | 30% |
| 2. Midterm: | 30% |
| 3. Individual project + Presentation: | 40% |

5. Tentative Time Table

| Date | Week | Class Content | Readings |
|-------------|-------------|--|-----------------|
| Jan. 6 | 1 | <ul style="list-style-type: none"> • Course information • Confidentiality, Integrity, and Availability (CIA) • Threats, Vulnerabilities and Controls • Common security threats | |
| 13 | 2 | <ul style="list-style-type: none"> • Access control | |
| 20 | 3 | <ul style="list-style-type: none"> • Encryption and decryption • Digital signatures • Public key certificates | |
| 27 | 4 | <ul style="list-style-type: none"> • Operating system security • Network security | |
| Feb. 3 | 5 | <ul style="list-style-type: none"> • Malware and anti-virus software • Common security protection techniques: Hardening, Firewalls, etc. | |
| 10 | 6 | <ul style="list-style-type: none"> • Midterm | |
| 17 | 7 | <ul style="list-style-type: none"> • Risk assessments | |
| 24 | 8 | <ul style="list-style-type: none"> • Security policies and practices • Privacy protection | |
| Mar. 3 | 9 | Study break | |
| 10 | 10 | <ul style="list-style-type: none"> • Cybercrime and cyber forensics | |
| 17 | 11 | <ul style="list-style-type: none"> • Review session | |
| 24 | 12 | <ul style="list-style-type: none"> • Project presentations | |
| 31 | 13 | <ul style="list-style-type: none"> • Project presentations • Final report due | |

6. McGill Policy Statements

- McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures. See <http://www.mcgill.ca/students/srr/honest> for more information.
- In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.
- Instructor generated course materials (e.g., handouts, notes, summaries, exam questions, etc.) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
- If you have a disability, please contact the instructor to arrange a time to discuss your situation. You may also consider contacting the [Office for Students with Disabilities](#) at 514-398-6009 before discussing with the instructor.
- Mobile computing and communications devices are permitted in class insofar as their use does not disrupt the teaching and learning process.
- [End-of-course evaluations](#) are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by e-mail when the evaluations are available on Mercury, the online course evaluation system. Please note that a minimum number of responses must be received for results to be available to students.
- McGill has policies on sustainability, paper use and other initiatives to promote a culture of sustainability at McGill. (See the [Office of Sustainability](#).)
- In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

7. Student's Responsibilities

- The in-class exercises are conducted in a team of 2-3 students without prior announcements. Students are expected to attend every class. There are no substitutions for missing in-class exercises. If you cannot attend class for any reason, you should talk or write to the instructor as soon as possible.
- Some course materials covered in class may not be available on the course website. Students are expected to read the assigned materials and to actively participate in class discussions.