

Course Outline (W2026)

COE817: Network Security

Instructor(s)	Dr. Truman Yang [Coordinator] Office: ENG435 Phone: (416) 979-5000 x 554175 Email: cungang@torontomu.ca Office Hours: By Appointment
Calendar Description	This course provides an introduction to the theory and application of security in computer network environments. Students will develop the skills necessary to formulate and address the security needs of wired and wireless network environments. The course will begin by an overview of network security and cryptography. Latter topics will cover transport level security, IP security, e-mail security, WiFi security, malicious code, firewall, and intrusion detection systems.
Prerequisites	COE768
Antirequisites	None
Corerequisites	None
Compulsory Text(s):	1. William Stallings, Cryptography and Network Security: Principles and Practice, 6th Edition, 752 pages, Prentice Hall, 2013, ISBN: 0133354695.
Reference Text(s):	1. Charles P. Pfleeger, Security in Computing, Fifth Edition. 2. William Stalling, Network Security Essentials: Applications and Standards, 6th Edition, Pearson Education, 2017.

<p>Learning Objectives (Indicators)</p>	<p>At the end of this course, the successful student will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate and apply core cyber security concepts and protocols to resist security threats in wired and wireless networks. (1c) 2. Use the knowledge of cryptography, security principles, existing security solutions and Java security packages. (4a) 3. Improve their capabilities of analyzing attacks on security protocols and designing complex security solutions for particular applications. (4b) 4. Manage the communications of a project. Lead the project team using effective strategies to manage conflict and leads team to successful project completion. (6b) 5. Write professionally prepared project report. Project reports are evaluated on their correctness, completeness, and language. (7a) 6. Understand most common legal issues of cybersecurity and legal obligations when considering cyber security priorities. (9b) 7. Understand security risks presented by the protection concerns associated with identified vulnerabilities. Use a framework for equities management decision-making process. (10b) <p>NOTE: Numbers in parentheses refer to the graduate attributes required by the Canadian Engineering Accreditation Board (CEAB).</p>														
<p>Course Organization</p>	<p>3.0 hours of lecture per week for 13 weeks 1.0 hours of lab per week for 12 weeks 0.0 hours of tutorial per week for 12 weeks</p>														
<p>Teaching Assistants</p>	<p>TBA</p>														
<p>Course Evaluation</p>	<table border="1" data-bbox="425 1020 1351 1432"> <thead> <tr> <th colspan="2" data-bbox="425 1020 1351 1081">Theory</th> </tr> </thead> <tbody> <tr> <td data-bbox="425 1081 1177 1142">Midterm Exam</td> <td data-bbox="1177 1081 1351 1142">25 %</td> </tr> <tr> <td data-bbox="425 1142 1177 1203">Final Exam</td> <td data-bbox="1177 1142 1351 1203">45 %</td> </tr> <tr> <th colspan="2" data-bbox="425 1203 1351 1264">Laboratory</th> </tr> <tr> <td data-bbox="425 1264 1177 1325">Labs</td> <td data-bbox="1177 1264 1351 1325">16 %</td> </tr> <tr> <td data-bbox="425 1325 1177 1386">Project and report</td> <td data-bbox="1177 1325 1351 1386">14 %</td> </tr> <tr> <td data-bbox="425 1386 1177 1432">TOTAL:</td> <td data-bbox="1177 1386 1351 1432">100 %</td> </tr> </tbody> </table> <p>Note: In order for a student to pass a course, a minimum overall course mark of 50% must be obtained. In addition, for courses that have both "Theory and Laboratory" components, the student must pass the Laboratory and Theory portions separately by achieving a minimum of 50% in the combined Laboratory components and 50% in the combined Theory components. Please refer to the "Course Evaluation" section above for details on the Theory and Laboratory components (if applicable).</p>	Theory		Midterm Exam	25 %	Final Exam	45 %	Laboratory		Labs	16 %	Project and report	14 %	TOTAL:	100 %
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<p>Examinations</p>	<p>Midterm exam in Week 7 (or 8), closed book. Final exam, 2 hours, closed-book (covers all chapters).</p>														
<p>Other Evaluation Information</p>	<p>Project (programming/research/report)</p>														

Teaching Methods	Audio support maybe used.
Other Information	None

Course Content

Week	Hours	Chapters / Section	Topic, description
1	3		Introduction to network security and cryptography (Chapter 1)
2-3	6		Symmetric and Public key base encryption (Chapters 3, 9 and 10)
4-5	6		Authentication protocols (Chapter 15)
6	3		Key management and distribution (Chapter 14)
7	3		Midterm Exam
8	3		Transport level security (Chapter 17)
9	3		Wireless network security (Chapter 16, 18)
10	3		Electronic Mail Security (Chapter 19)

11	3		IP Security (Chapter 20)
12	3		Malicious Software (Chapter 21)
13	3		Intrusion Detection and Firewalls (Chapter 22 and 23)

Laboratory(L)/Tutorials(T)/Activity(A) Schedule

Week	L/T/A	Description
2 - 3	-	Lab 1: Java Socket Programming
4 - 5	-	Lab 1 demo Lab 2: Authentication protocols
6	-	Lab 2 demo Lab 3: Key Distribution Protocols
7 - 8	-	Lab 3 demo Lab 4: Design and develop a complex application
9 - 11	-	Lab 4 demo Project
12-13	-	Project demo

University Policies & Important Information

Students are reminded that they are required to adhere to all relevant university policies found in their online course shell in D2L and/or on [the Senate website](#)

Refer to the [Departmental FAQ page](#) for further information on common questions.

Important Resources Available at Toronto Metropolitan University

- [The University Libraries](#) provide research [workshops](#) and individual consultation appointments. There is a drop-in Research Help desk on the second floor of the library, and students can use the [Library's virtual research help service](#) to speak with a librarian, or [book an appointment](#) to meet in person or online.
- [Student Life and Learning Support](#) offers group-based and individual help with writing, math, study skills, and transition support, as well as [resources and checklists to support students as online learners](#).
- You can submit an [Academic Consideration Request](#) when an extenuating circumstance has occurred that has significantly impacted your ability to fulfill an academic requirement. You may always visit the [Senate website](#) and select the blue radio button on the top right hand side entitled: Academic Consideration Request (ACR) to submit this request.

For Extenuating Circumstances, [Policy 167: Academic Consideration](#) allows for a once per semester ACR request without supporting documentation if the absence is less than 3 days in duration and is not for a final exam/final assessment. Absences more than 3 days in duration and those that involve a final exam/final assessment, always require documentation. Students must notify their faculty/contract lecturer once a request for academic consideration is submitted. See Senate [Policy 167: Academic Consideration](#).

Longer absences are not addressed through Policy 167 and should be discussed with your Chair/Director/Program to be advised on next steps.

- [FAQs Academic Considerations and Appeals](#)
- Information on Copyright for [Faculty/Contract Lecturers](#) and [students](#).

Lab Safety (if applicable)

Students are to strictly adhere and follow:

- a. The Lab Safety information/guidelines posted in the respective labs,
- b. provided in their respective lab handouts, and
- c. instructions provided by the Teaching Assistants/Course instructors/Technical Staff.

During the lab sessions, to avoid tripping hazards, the area around the lab stations should not be surrounded by bags, backpacks etc, students should place their bags, backpacks etc against the walls of the labs and/or away from their lab stations in such a way that it avoids tripping hazards.

Accessibility

- Similar to an [accessibility statement](#), use this section to describe your commitment to making this course accessible to students with disabilities. Improving the accessibility of your course helps minimize the need for accommodation.
- Outline any technologies used in this course and any known accessibility features or barriers (if applicable).
- Describe how a student should contact you if they discover an accessibility barrier with any course materials or technologies.

Academic Accommodation Support

Academic Accommodation Support (AAS) is the university's disability services office. AAS works directly with incoming and returning students looking for help with their academic accommodations. AAS works with any student who requires academic accommodation regardless of program or course load.

- Learn more about [Academic Accommodation Support](#).
- Learn [how to register with AAS](#).
- Learn about [Policy 159: Academic Accommodation of Students with Disabilities](#)

Academic Accommodations (for students with disabilities) and Academic Consideration (for students faced with extenuating circumstances that can include short-term health issues) are governed by two different university policies. Learn more about [Academic Accommodations versus Academic Consideration and how to access each](#).

Wellbeing Support

At Toronto Metropolitan University, we recognize that things can come up throughout the term that may interfere with a student's ability to succeed in their coursework. These circumstances are outside of one's control and can have a serious impact on physical and mental well-being. Seeking help can be a challenge, especially in those times of crisis.

If you are experiencing a mental health crisis, please call 911 and go to the nearest hospital emergency room. You can also access these outside resources at anytime:

- **Distress Line:** 24/7 line for if you are in crisis, feeling suicidal or in need of emotional support (phone: 416-408-4357)
- **Good2Talk:** 24/7-hour line for postsecondary students (phone: 1-866-925-5454)
- **Keep.meSAFE:** 24/7 access to confidential support through counsellors via [My SSP app](#) or 1-844-451-9700

If non-crisis support is needed, you can access these campus resources:

- **Centre for Student Development and Counselling:** 416-979-5195 or email csdc@torontomu.ca
- **Consent Comes First - Office of Sexual Violence Support and Education:** 416-919-5000 ext 3596 or email osvse@torontomu.ca
- **Medical Centre:** call (416) 979-5070 to book an appointment

We encourage all Toronto Metropolitan University community members to access available resources to ensure support is reachable. You can find more resources available through the [Toronto Metropolitan University Mental Health and Wellbeing](#) website.