Toronto Metropolitan University

Computer Science
Graduate Studies

COURSE LISTING – FALL 2025

Course	Course Name	Professor	Schedule	Location
CP8101*	Research Methods	Dr. A. Ferworn	Wednesday 15:00 - 18:00	TRS2129
CP8301	Secure Computing	Dr. C. Gravel	Friday 13:00 - 16:00	VIC500
CP8307	Introduction to Computer Vision	Dr. R. Wang	Tuesday 08:00 - 11:00	DSQ06
CP8310*	Directed Studies: Master's	N/A	N/A	N/A
CP8312*	Directed Studies: Doctoral	N/A	N/A	N/A
CP8318	Machine Learning	Dr. E. Lugez	Wednesday 08:00 - 11:00	DSQ06
CP8321	Introduction to Deep Learning	Dr. A. Sadeghian	Thursday 14:00 - 17:00	VIC206
CP8325	Digital Image Processing	Dr. A. Hamzehlou Kahrizi	Tuesday 12:00 - 15:00	VIC500
CP8337*	Directed Studies: Research Methodologies	N/A	N/A	N/A
CP8339	Recommender Systems	Dr. C. Ding	Friday 09:00 - 12:00	VIC300

* Requires a Directed Studies / Restricted Courses Request Form for enrollment, available at https://www.torontomu.ca/cs/graduate/forms-guidelines/

Notes:

1. Fall 2025 classes begin Tuesday, September 2, 2025.
2. Refer to the Significant Dates for course ADD and DROP deadlines:
https://www.torontomu.ca/graduate/calendar/significant-dates/
3. See the Graduate Calendar for Program Curriculum and Course Descriptions:
https://www.torontomu.ca/graduate/calendar/programs-and-courses/

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COURSE DESCRIPTIONS

CP8101 Research Methods

This course is designed to assist graduate students in developing the skills necessary to design and execute a research protocol aligned with their degree requirements. It complements the specific research programs devised by the student in collaboration with their supervisors. The course covers several topics, such as: the nature of scientific inquiry, library research skills, formulation and testing of hypotheses, experimental design, literature reviews, publishing in peer-reviewed venues, and professional responsibilities in research. Pass/Fail.

CP301 Secure Computing

The importance of security for computer systems: protection, access control, distributed access control, Unix security, applied cryptography, network security, firewalls, secure coding practices, safe languages, mobile code. Computer and network forensics techniques. Computer security techniques. Legal and Ethical issues. Topics may include cryptographic protocols, privacy, anonymity, and/or other topics as time permits. 1 Credit.

CP8307 Introduction to Computer Vision

This course describes foundational concepts of computer vision. In particular, the course covers the image formation process, image representation, feature extraction, model fitting, motion analysis, 3D parameter estimation and applications. 1 Credit.

CP8310 Directed Studies: Master's

This course is for Master's students who wish to gain knowledge in a specific area for which no graduate level classes are offered. Students are required to present the work of one term(not less than 90 hours in the form of directed research, tutorials and individual study) in an organized format. 1 Credit.
Not available to Course option students.

CP8312 Directed Studies: Doctoral

This doctoral-level directed studies course provides an opportunity for students to engage in in-depth research and exploration of advanced topics in computer science that are not covered by existing courses in the program. Students will work closely with a faculty advisor to identify and investigate emerging areas of interest or specialized topics, which may include interdisciplinary applications, novel computational methods, or theoretical advancements. 1 Credit.

CP8318 Machine Learning

Machine learning is the study of algorithms that learn to perform a task from prior experience. Machine learning has a broad range of applicability, including computer vision, robotics, medical diagnosis, bioinformatics and natural language processing. This course will cover the underlying theory and practical applications of machine learning. 1 Credit.

CP8321 Introduction to Deep Learning

This course is an introduction to deep learning and its applications. The main topics discussed in the course include feedforward/recurrent neural networks, backpropagation learning algorithm, Convolutional Neural Networks (CNN), Long Short Term Memory (LSTM), and Autoencoders. 1 Credit.

CP8325 Digital Image Processing

Digital image processing has been widely used in our daily lives, from entertainment, multimedia, to medicine. This course introduces the fundamentals and principles of digital image processing and its applications. Students will gain hands-on experience

in using image processing techniques to solve practical problems. Topics include image acquisition, transformation, filtering, enhancement, and compression, as well as state-of-the-art developments in image processing. 1 Credit.

CP8337 Directed Studies: Research Methodologies

This course offers students the opportunity to engage in individualized, in-depth study of research methodologies in computer science under the supervision of a faculty member. The course is designed to develop advanced skills in designing, conducting, and evaluating research, emphasizing the critical analysis of existing work, research design principles, and the ethical dimensions of conducting research. Students will work closely with their supervisor to tailor the course content to their research interests and academic goals. Pass/Fail.

CP8339 Recommender Systems

Recommender systems are software systems that help users in the decision-making process. They serve as filtering tools to alleviate the information overload problem. In this course, students will learn the basic concepts of recommender systems, three types of recommender systems (content-based, collaborative filtering and hybrid), popular models (machine learning based, matrix factorization, deep learning based) and evaluation measurements. Special recommendation applications and advanced topics may be discussed, such as session-based recommender systems, fairness and bias. 1 Credit.