Toronto Metropolitan University

Graduate Programs
Computer Science

COURSE LISTING – WINTER 2027

Course	Course Name	Professor	Schedule	Location
CP8202	Advanced Software Engineering	TBA	Monday 15:00 – 18:00	KHE117
CP8204	Advanced Programming Languages	TBA	Thursday 14:00 – 16:00 Monday 14:00 – 15:00	DSQ03 DSQ12
CP8206	Soft Computing and Machine Intelligence	Dr. V. Hu	Tuesday 09:00 – 12:00	VIC300
CP8210	Topics in Data Science	Dr. A. Abhari	Friday 11:00 – 14:00	VIC306
CP8310*	Directed Studies: Master's	N/A	N/A	N/A
CP8312*	Directed Studies: Doctoral	N/A	N/A	N/A
CP8314	Advanced Artificial Intelligence	Dr. M. Soutchanski	Friday 14:00 – 16:00 Monday 10:00 – 11:00	TRS2147 TRS2149
CP8324	Computational Geometry	Dr. Y. Bahoo	Wednesday 09:00 – 12:00	KHS134
CP8326	Heuristic Search	Dr. R. Valenzano	Wednesday 12:00 – 15:00	ILC102
CP8337*	Directed Studies: Research Methodologies	N/A	N/A	N/A

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

Notes:

1. Winter 2027 classes begin Friday, January 15, 2027.
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

CP8202 Advanced Software Engineering
Modern approaches to software development are studied including requirements analysis, system design techniques, formal description techniques, implementation, testing, debugging, metrics, human factors, quality assurance, cost estimation, maintenance, and tools. 1 Credit. *Note: This course is cross-listed with undergraduate course CPS831, for which the pre-requisite is CPS731.*

CP8204 Advanced Programming Languages
A study of the principles, concepts, and mechanisms of computer programming languages - their syntax, semantics, and pragmatics; the processing and interpretation of computer programs; programming paradigms; and language design. Additional topics will include language design principles and models of language implementation. 1 Credit. *Note: This course is cross-listed with undergraduate course CPS506, for which the pre-requisite is CPS209.*

CP8206 Soft Computing and Machine Intelligence
Introduction to basic concepts and techniques of soft computing including: neural, fuzzy, evolutionary computation and their applications. 1 Credit.

CP8210 Topics in Data Science
This course presents concepts related to data science research activities including data management and analytics, data modeling, structured and unstructured data, regression models, social data analysis, web and data mining, information retrieval, text analysis and natural language processing. 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.

CP8314 Advanced Artificial Intelligence
The course will focus on the theory and implementation of dynamical systems from the perspective of artificial intelligence. The emphasis will be on the compromises involved in providing useful logical representations that allow reasoning about actions to remain tractable. The course will show how these research issues are relevant for many applications beyond the traditional area of artificial intelligence. 1 Credit. *Note: This course is cross-listed with undergraduate course CPS822, for which the pre-requisite is CPS721.*

CP8324 Computational Geometry
Computational Geometry studies problems which can be described geometrically. Such problems arise from our environment as we deal with geometric objects and their interactions, such as in computer graphics, robotics, and manufacturing. In this course, students learn to design algorithms and data structures for geometric problems. These problems include but are not limited to the following topics: convex hull, Voronoi diagram, triangulation, visibility, and geometric data structures. 1 Credit.

CP8326 Heuristic Search

Heuristic search is a popular Artificial Intelligence method used in a variety of applications including robotics, combinatorial optimization, route pathfinding, and automated planning. In this course, we will investigate algorithms for solving search problems, and consider methods for automatically generating heuristic functions. Topics will include optimal and suboptimal search algorithms, abstraction and graph embedding-based heuristic generation methods, and Monte Carlo Tree Search. 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.