Graduate Studies in Computer Science
Course Listing – Fall 2020

Course	Course Name	Professor	Schedule	Location
CP8101*	Research Methods for Doctoral Students	Dr. A. Sadeghian	Tuesday 09:00-12:00	Virtual
CP8201	Advanced Algorithms	J. Doliskani	Tuesday 13:00-16:00	Virtual
CP8215*	Research Methods in Computer Science	Dr. A. Sadeghian	Tuesday 09:00-12:00	Virtual
CP8305	Knowledge Discovery	Dr. C. Ding	Wednesday 12:00-15:00	Virtual
CP8309	Special Topics: Emerging Computer Science – Model-Driven Engineering *(FOR STUDENTS IN THE MSc PROGRAM)*	Dr. S. Mustafiz	Thursday 15:00-18:00	Virtual
CP8310*	Directed Studies in Computer Science	N/A	N/A	N/A
CP8312*	Directed Studies: Intelligence and Robotics	N/A	N/A	N/A
CP8313*	Directed Studies: Networks	N/A	N/A	N/A
CP8316	Special Doctoral Topics: Networks – Model-Driven Engineering *(FOR STUDENTS IN THE PhD PROGRAM)*	Dr. S. Mustafiz	Thursday 15:00-18:00	Virtual
CP8318	Machine Learning	Dr. N. Farsad	Friday 14:00-17:00	Virtual
CP9102*	Doctoral Seminar	Dr. I. Woungang	Monday 12:00-13:00	Virtual

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

Notes:
1. Fall classes begin Tuesday, September 8, 2020.
2. Refer to the Significant Dates for course ADD and DROP deadlines:
https://www.ryerson.ca/graduate/calendar/significant-dates/
3. See the Graduate Calendar for Program Curriculum and Course Descriptions:
https://www.ryerson.ca/graduate/calendar/programs-and-courses/

Course Descriptions

CP8101 Research Methods for Doctoral Students
This course is designed to assist students in developing skills necessary to design and execute a research protocol for their terminal degree. The course is intended to complement the specific research programs devised by the student and his/her advisors. The course covers the following topics: nature of scientific inquiry, library skills, formulation and testing of hypotheses, experimental design, statistical analysis of data, human subjects, use of humans and animals in research, and professional responsibility in research grants and funding for research. Pass/Fail

CP8201 Advanced Algorithms
This course covers advanced methods of algorithmic design and analysis with focus on efficiency and correctness of algorithms. The course reviews several popular algorithm design techniques and selected well-known algorithms. The final parts of the course include introduction to practical algorithms for computationally challenging problems, using heuristics, approximation algorithms and introduction to randomization algorithms. 1 Credit

CP8215 Research Methods in Computer Science
A transition to research-based learning for computer science students designed to assist them in developing a research protocol. The course complements specific research programs devised by the students and their supervisors. Topics may include: the nature of scientific inquiry; information gathering skills; formulation and testing of hypotheses; experimental design; planning; analysis of data; ethical and professional responsibility in research.1 Credit
Not available to Course option students. Only one of CP8310 and CP8215 may be taken for credit toward degree completion.

CP8305 Knowledge Discovery
Steps in the process of knowledge discovery: data preprocessing, data mining, post-processing and knowledge utilization. Preprocessing: data cleaning, integration, transformation and reduction. Data mining methods: association rules, classification and clustering. Post-processing: knowledge evaluation, interpretation, presentation and visualization. Knowledge discovery and data management. Possibly other selected topics in knowledge discovery. 1 Credit.

CP8309 Special Topics: Emerging Computer Science
This special topics course examines selected, advanced topics in areas related to emerging areas of computer science that are not covered by existing courses. The topic(s) will vary depending on the need and the instructor. 1 Credit
Topic for Fall 2020: **Model-Driven Engineering**: This course is designed to introduce students to the field of model-driven engineering (MDE). MDE is a software development methodology in which software models are treated as first-class citizens in the engineering process. Topics to be discussed include modelling languages, domain-specific modelling, model management, model transformation, modelling and simulation, and model analysis.

CP8310 Directed Studies in Computer Science
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 wishing to take the class would be assigned a suitable class advisor most familiar with the specific area of interest. 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. Only one of CP8310 and CP8215 may be taken for credit toward degree completion.

CP8312 Directed Studies: Intelligence and Robotics
This course explores theoretical, practical and experimental (if applicable) problems in great depth in the areas of intelligence and robotics with emphasis on the aspects of Intelligence and Robotics and their application related to the discipline of Computer

Science. Doctoral students must present their findings in a formal report. 1 Credit.

CP8313 Directed Studies: Networks

This course explores theoretical, practical and experimental (if applicable) problems in great depth in areas of computer and communication networks with emphasis on the aspects of computer networking and its application related to the discipline of Computer Science. Doctoral students must present the findings in a formal report. 1 Credit

CP8316 Special Doctoral Topics: Networks

This special topics course will present material that is not currently part of the regular computer science doctoral program but are of interest to faculty and students in the field of Networking. 1 Credit

Topic for Fall 2020: **Model-Driven Engineering**: This course is designed to introduce students to the field of model-driven engineering (MDE). MDE is a software development methodology in which software models are treated as first-class citizens in the engineering process. Topics to be discussed include modelling languages, domain-specific modelling, model management, model transformation, modelling and simulation, and model analysis.

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.

CP9102 Doctoral Seminar

The purpose of the Doctoral Seminar is to provide students exposure to the latest research, issues and findings related to the discipline of Computer Science. The seminar will consist of invited guests and talks by experts from industry, academia and graduate students themselves. Students will have an opportunity to improve their writing and critical thinking skills through assigned work associated with the seminar topics. All students are required to attend and actively participate in seminars every semester for a total of six semesters. A doctoral candidate must give two publicly announced research seminars on his/her thesis research. The student's supervisor(s) and at least one other member of the student's Dissertation Supervisory Committee must attend this seminar. The quality of the student's presentation will be graded on a Pass/Fail basis. Each student will be required to pass each research seminar presentation. Pass/Fail.