



Faculty of Science

Department of Computer Science

## Course Outline (Winter 2017)

### CPS 420 – Discrete Structures

<b>Instructor</b>	Sophie Quigley Dept. of Computer Science, Ryerson University Office: ENG263 Tel: 416-979-5000, x7401, Email: cps420@scs.ryerson.ca Office Hours: Thursdays 2:00-4:00PM
<b>Prerequisites</b>	None in W2017 due to a mistake in the calendar. However, this mistake has been corrected for W2018 when MTH110 will be a prerequisite, as was the case for MTH210 which this course replaces. Students who have not passed MTH110 are encouraged to do so before taking this course: the MTH110 material is essential to CPS420.
<b>Calendar Description</b>	Introduction to discrete structures and probability as they apply to design and analysis. Review of proof techniques: induction and recursion. Graphs and trees, and their applications in computing. Finite automata and computability. Counting: arithmetic and geometric progressions, permutations and combinations, modular arithmetic. Probability.
<b>Compulsory Textbook</b>	<a href="#"><u>Discrete Mathematics with Applications 4<sup>th</sup> Ed. by Susanna S. Epp. Brooks/Cole CENGAGE Learning ISBN-13: 978-0-495-39132-6, ISBN-10: 0-495-39132-8</u></a>
<b>Reference Textbooks</b>	None
<b>Course Organization</b>	3 hours of lecture per week for 12 weeks
<b>Learning Objectives</b>	At the end of the course, a successful student will be able to: <ol style="list-style-type: none"><li>1. Have a good understanding of the mathematical material listed in the course content section.</li><li>2. Be able to apply this knowledge to problems in computer science.</li></ol>

**Course  
Content**

**Topics (approximate hours)**

- Introduction and review of proof techniques (2 hours)
- Recurrence relations, sequences, mathematical induction and recursion (8 hours)
- Graphs and trees (9 hours)
- Regular Expressions and finite state automata (8 hours)
- Counting and probabilities (9 hours)

**Course  
Evaluation**

Type	Handed out	<a href="#">Due</a>	<a href="#">Late Penalty</a>	Weight	<a href="#">Team Size</a>
<a href="#">Assign. 1</a>	Jan 27	Feb 10	-3 <sup>n</sup>	10%	1 or 2
<a href="#">Midterm 1</a>	Feb 17	Feb 17	-100%	15%	1
<a href="#">Assign. 2</a>	Feb 17	Mar 10	-3 <sup>n</sup>	10%	1 or 2
<a href="#">Midterm 2</a>	Mar 24	Mar 24	-100%	15 %	1
<a href="#">Assign 3</a>	Mar 24	Apr 7	-3 <sup>n</sup>	10%	1 or 2
<a href="#">Final Exam</a>	Exam period		-100%	40%	1

**Details**

Details on how to submit assignments on the due date, late penalties, team sizes are available by clicking on the links in the above table or at <http://cps420.scs.ryerson.ca/>. In particular: Teams who want to have one more member than the specified maximum for an assignment can do so with a penalty, but they must declare all team members on the marking sheet of that assignment when the assignment is submitted. Failure to do so constitutes academic misconduct and will be treated accordingly.

**Course  
Technology**

- D2L is used for grades and communications
- Other course information is posted on <http://cps420.scs.ryerson.ca/>

**Evaluation  
Guidelines**

Details on the evaluations will be available in D2L and on <http://cps420.scs.ryerson.ca/>

**Missed  
Evaluations**

Students are required to inform their instructors of any situation which arises during the semester which may have an adverse effect upon their academic performance, and must request any considerations and accommodations according to the relevant policies and well in advance. Failure to do so will jeopardize any academic appeals.

- *Medical certificates* – If a student misses the deadline for submitting an assignment, or the date of an exam or other evaluation component because of illness, he or she must submit a Ryerson Student Medical Certificate AND an Academic Consideration form within 3 working days of the missed

date. Both documents are available at [www.ryerson.ca/senate/forms/medical.pdf](http://www.ryerson.ca/senate/forms/medical.pdf). If you are a full-time or part-time degree student, then you submit your forms to your own program department or school. If you are a certificate or non-certificate student, then you submit your forms to the staff at the front desk of the Chang School.

- *Religious observance* – If a student needs accommodation because of religious observance, he or she must submit a Request for Accommodation of Student Religious, Aboriginal and Spiritual Observance AND an Academic Consideration form within the first 2 weeks of the class or, for a final examination, within 2 weeks of the posting of the examination schedule. If the required absence occurs within the first 2 weeks of classes, or the dates are not known well in advance as they are linked to other conditions, these forms should be submitted with as much lead time as possible in advance of the required absence. Both documents are available at <http://www.ryerson.ca/senate/forms/reobservforminstr.pdf>. If you are a full-time or part-time degree student, then you submit the forms to your own program department or school. If you are a certificate or non-certificate student, then you submit the forms to the staff at the front desk of the Chang School.
- *Students who need academic accommodation support* should register with the Academic Accommodation Support office (formerly called the Access Centre). Before the first graded work is due, registered students should inform their instructors through an “Accommodation Form for Professors” that they are registered with Academic Accommodation Support and what accommodations are required.

### **Communication with Students**

Ryerson’s email policy <http://www.ryerson.ca/content/dam/senate/policies/pol157.pdf> states that only Ryerson e-mail accounts are to be used for communication with students. All students, including continuing education students, have access to Ryerson email through their [my.ryerson.ca](http://my.ryerson.ca) site, and this is the official way in which they receive communication. All students are required to register for and maintain this account. ***Emails sent from other accounts may not be answered!***

### **Academic Policies**

- a. *Ryerson Policies of Interest*  
Ryerson Senate Policies - <http://www.ryerson.ca/senate/policies/>  
Ryerson Academic Integrity - <http://www.ryerson.ca/academicintegrity/>  
Policy 46 - Undergraduate Grading, Promotion and Academic Standing  
Policy 60 - Student Code of Academic Conduct  
Policy 61 - Student Code of Non-academic Conduct  
Policy 134 - Undergraduate Academic Consideration and Appeals  
Policy 135 - Examination Policy  
Policy 150 - Accommodation of Student Religious Observance Obligations

Policy 157 - Student Email Accounts for Official University Communication

- b. *Obligations* – Students need to inform faculty of any situation arising during the semester which may have an adverse effect upon their academic performance; they must request any necessary considerations (e.g. medical or compassionate), or accommodations [e.g. religious observance, disability (should be registered with the Access Center), etc.] according to policies and well in advance. Failure to do so will jeopardize any academic appeals.
- c. *Re-grading and Re-calculation* – Must be requested within 10 working days of the return of the graded assignment to the class.

**Academic Conduct**

<http://www.ryerson.ca/academicintegrity/>

In order to create an environment conducive to learning and respectful of others' rights, phones and pagers must be silenced during lectures, lab sessions and evaluations. Students should refrain from disrupting the lectures by arriving late and/or leaving the classroom before the lecture is finished.

**Academic Misconduct**

According to the Ryerson policy 60

(<http://www.ryerson.ca/content/dam/senate/policies/pol60.pdf>), academic misconduct includes, but is not limited to:

- Plagiarism which is the claiming of words, ideas, artistry, drawings or data of another person. This also includes submitting your own work in whole or in part for credit in two or more courses.
- Cheating
- Misrepresentation of personal identity or performance
- Submission of false information
- Contributing to academic misconduct
- Damaging, tampering, or interfering with the scholarly environment
- Unauthorized copying or use of copyrighted materials
- Violations of departmental policies or professional behavior
- Violations of specific departmental or course requirements

*Committing academic misconduct will trigger academic penalties, including:*

- *course-grade reduction greater than a grade of “zero” (0) on course work*
- *failing grades, suspension and possibly expulsion from the University.*

*As a Ryerson student, you are responsible for familiarizing yourself with Ryerson conduct policies.*

**Non-Academic Conduct**

Ryerson's Student Code of Non-academic Conduct is described in Senate Policy 61:

<http://www.ryerson.ca/content/dam/senate/policies/pol61.pdf>

Among many other infractions, the code specifically refers to the following as a violation: “Disruption of Learning and Teaching - Students shall not behave in disruptive ways that obstruct the learning and teaching environment”.