

CO 380 Mathematical Discovery and Invention Spring 2020

Lecture Information: Online Offering

Instructor Information:

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Virtual Office Hours: Given that we are spread all over the globe, time zone differences can make ‘attending’ office hours challenging for many students. Thus, we will use the Discussion Forums within Learn as well as direct email (mceden@uwaterloo.ca) to communicate in this course offering.

Objective: The main objective of CO 380 this term will be to extend your mathematical problem solving ability. We will consider some of the most important problem-solving techniques typically encountered in undergraduate mathematics and illustrate their use through interesting examples and assigned problems. Some new mathematical content will be taught when it is deemed necessary for the understanding of certain problems and their solutions.

Learning Outcomes: By the end of this course, you will be able to:

- List roughly a dozen standard problem solving techniques and provide examples in which each is useful;
- Select and apply standard problem solving techniques as appropriate to a given problem; and
- Solve problems at a variety of levels from a variety of mathematical topic areas.

Prerequisites: MATH 135 or 145, 106/125 or 136 or 146, 138 or 148; Level at least 3A

Textbook: There is no required textbook for this course. Many excellent resource books in mathematical problem-solving have been written. Please speak to your instructor if you feel the need to purchase such a resource.

Website: <http://learn.uwaterloo.ca>

Discussion Board: This will be hosted on Learn.

Assignments: There will be 6 assignments to be handed in. Each of A#1 through A#6 will consist of roughly 8 problems, will be equally weighted, and combined will be worth 70% of your final mark. These are due to be handed in via Crowdmark by 11:55 p.m. EDT on the following Fridays: May 29, June 12, June 26, July 10, July 24, August 7. *Late assignments will not be graded.* While you are encouraged to work together to understand the assignment problems, the solutions that you submit must be your own work and so should be written up without any consultation with your classmates or other sources external to the course.

Quizzes: There will be 12 multiple choice quizzes which will be completed within Learn. Once available, quizzes may be completed at any time but are due on the Tuesdays specified in the Course Schedule by 11:55 p.m. EDT. The best 10 of 12 quizzes will count 30% toward your final mark. Many quiz questions are designed to test your basic understanding of the problems from the previous week’s lessons by asking you to work through a variation or extension of one of the problems. There is no time limit for each quiz, but you may only take a quiz once. Quiz questions are to be completed individually, without consultation with others.

Solutions: Solutions to all assignment questions and to quiz questions which were not particularly well done will be posted on the course website.

Grades: Assignments: 70%; Quizzes: 30%.

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. Refer to Academic Integrity website (<https://uwaterloo.ca/academic-integrity/>) for details.

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-70>) Student Petitions and Grievances, Section 4. When in doubt, please contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g. plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71 (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/policy-71>) Student Discipline. For typical penalties check Guidelines for the Assessment of Penalties (<https://uwaterloo.ca/secretariat/policies-procedures-guidelines/guidelines/guidelines-assessment-penalties>).

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) www.adm.uwaterloo.ca/infosec/Policies/policy72.htm.

Note for Students with Disabilities: AccessAbility Services (<http://uwaterloo.ca/disability-services/>), located in the new addition to Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the office at the beginning of each academic term.

Course Schedule:

Week #	Dates	Notes
Week 1	May 11-15	
Week 2	May 19-22	Q#1 due May 19
Week 3	May 25-29	Q#2 due May 26, A#1 due May 29
Week 4	June 1-5	Q#3 due June 2
Week 5	June 8-12	Q#4 due June 9, A#2 due June 12
Week 6	June 15-19	Q#5 due June 16
Week 7	June 22-26	Q#6 due June 23, A#3 due June 26
Week 8	June 29 - July 3	Q#7 due June 30
Week 9	July 6-10	Q#8 due July 7, A#4 due July 10
Week 10	July 13-17	Q#9 due July 14
Week 11	July 20-24	Q#10 due July 21, A#5 due July 24
Week 12	July 27-31	Q#11 due July 28
Week 13	Aug 4-7	Q#12 due Aug 4, A#6 due Aug 7