

University of Toronto at Scarborough
Department of Computer & Mathematical Sciences

MATB61H3

Linear Programming & Optimization

2020 Winter

To be enrolled in this course you must have previously completed MATA22/ MATA23.

Textbook: **Elementary Linear Programming With Applications**

B. Kolman & R. Beck, 2nd edition

Grading Scheme:

Quizzes	25%	
Midterm Exam	30%	(date/time/place TBA)
Final Exam	45%	(date/time/place TBA)

Course Homepage: All course information, lecture notes, assignments, announcements and etc will be available on the course webpage on Quercus:

<https://q.utoronto.ca/>

Instructors: Xiamei Jiang Office: **IC340** Phone: 416 287 7546
Email: jiang@utsc.utoronto.ca

Note: You must use your University of Toronto email to contact the instructor. Be sure to include the course code as part of the subject line and sign the email with your first and last name, as well as your student ID.

Assignments: : Assignment will be posted at the website on a weekly basis. They will contain dates and information regarding quizzes and tests, information about relevant reading sections from the text, and homework problems. Assignments are not to be handed in. You are strongly encouraged to work through all of the problems in each assignment in order to help you to understand the material and to prepare for the quizzes and test.

Tutorials: You will have a 1-hour tutorial each week which will begin in the week of Jan **13th**. It is essential that you enroll in a tutorial not later than the first week of classes. You should know your tutorial leader's name, your tutorial number, day, and time.

Quizzes: There will be biweekly quizzes written in your tutorials. There will be a total of 5 quizzes to be given during weeks 3, 5, 7, 9, 11. Each quiz will be 30 minutes long. Quizzes must be written in your own tutorial. The first quiz will be written in the week of Jan. **20th**. If you write a quiz in a tutorial you are not registered in, then your quiz mark will not be recorded.

Course Syllabus:

1. Introduction to linear programming (Chapter 1)
Mathematical models, Concepts, notations and theorems of linear programming, Graphic solutions, and basic solutions.
2. The simplex method (Chapter 2)
The simplex method, Degeneracy, Two phases method, and Big M method.
3. Duality and applications (Chapter 3)
Weak duality, Strong duality, Complementary slackness, and The dual simplex method.
4. Game theory (supplementary)
Setting up the payoff matrix for a matrix game, simplifying it using domination, writing down the corresponding LP problem (see the posted notes); solve the corresponding LP problem.
5. Integer programming (Chapter 4)
Cutting plane method for pure and mixed integer programming problems
Branch and bound method for Pure and MIXED integer programming problem
6. Transportation, assignment and network problems (Chapter 5)

Office hours: Xiamei Jiang

Monday 11:00pm -13:00pm in IC340.

All tutorial leaders will have office hours in IC404. The detail will be posted on Quercus soon.

Office hours start in the week of the week of Jan **13th**, the second week of the term.

Please take advantage of this opportunity for additional help.

Calculators: Students may use ONE standard hand-held calculator **without graphing function** during the writing of quizzes, the midterm test, and the final exam. The following electronic devices are prohibited during quiz/test/exam writing: calculator with graphic function, I-Pods, I-Pad, Laptop computers, Cell Phones/Smart Phones, or any other electronic calculating, data storage, or data transmission device that is not a standard hand-held calculator. Students may not use more than one calculator during the writing of a quiz, midterm test, or final exam.

Missed work: Quizzes can not be written at a different time or in a tutorial other than the one in which you are registered. If you miss a quiz due to a legitimate reason a make up quiz will be provided during your TA's office hour following the tutorial you miss in IC404.

In order to qualify to write it, you must notify your TA by email no later than **48 hours** from the ending of the missed quiz and if the reason is medical, an official UTSC medical form should be downloaded from

<http://www.utoronto.ca/registrar/sites/utoronto.ca/registrar/files/resource-files/UTSCmedicalcertificate.pdf>

If you missed the midterm test for legitimate reasons, you must provide the information to X. Jiang, <jiang@utsc.utoronto.ca> within **48 hours**. Your midterm mark weight will be moved to the final.

Accessibility: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach your instructor and/or the AccessAbility Services Office as soon as possible. We will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations
(416) 287-7560 or ability@utsc.utoronto.ca.
For more info look at <http://www.utsc.utoronto.ca/~ability/>.

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences

<http://www.utsc.utoronto.ca/vpdean/academic-integrity>

Potential offences include, but are not limited to misrepresenting your identity, using or possessing unauthorized aids or looking at someone else's answers during an exam, a test or quizzes.