MAST 324
Introduction to Optimization
Winter 2019

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Office Hours: Thursdays, 11:00-1:00 PM.

Textbook: Lecture notes and (if needed recommended text book is)

Final Grade: (1) Midterm Exam 40%
(2) Final Exam Part A 60%, Part B (midterm make up) 40%

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

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<th>Weeks</th>
<th>Lecture notes</th>
<th>Topics</th>
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| 1     | Introduction to Linear Programming | Linear Programming Problem (LPP)  
Matrix and expended forms  
Modeling and Examples  
Graphical interpretation for two variable problems |
| 2     | Convexity | Convex sets, and convex hull  
Convex combinations and functions  
Hessian and principle minors |
| 3     | Extreme points and directions | Extreme points  
Unbounded polyhedron and its directions  
Slack variables |
| 4     | Corner Point Theorem | Convex Cones  
Representation & Corner point theorem  
Unbounded LPP |
| 5     | The Simplex Method | Basic ideas of the simplex method - algebraic solution  
Initial and final feasible tableau |
| 6     | Continuation of the simplex method | Unboundness  
Alternative solution |
| 7     | Review: Midterm | |
| 8     | Degeneracy | Cycling & stalling  
Degenerated tableau, and associated basic feasible solutions  
Lexicographic ordering to Preventing cycling |
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<th>Artificial variables</th>
<th>The Revised Simplex Method</th>
<th>The Revised Simplex Method and Sensitivity Analysis</th>
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<td>Initial problem</td>
<td>The two-phase method</td>
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<td>Single artificial variable technique</td>
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**Academic Integrity and the Academic Code of Conduct**

This course is governed by Concordia University’s policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. “Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia’s website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: [concordia.ca/students/academic-integrity](http://concordia.ca/students/academic-integrity).” [Undergraduate Calendar, Sec 17.10.2]