Department of Mathematics & Statistics
Concordia University

MAST 324
Introduction to Optimization
Winter 2018

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

Textbook: Lecture notes and (if needed recommended text book is)
Operations Research: Applications and Algorithms, by Wayne L. Winston, Brooks/Cole.

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.

Weeks	Lecture notes	Topics
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

9	Artificial variables	Initial problem The two-phase method Single artificial variable technique
10	The Revised Simplex Method	The tableau form The product form
11	Duality	Dual LPP Karush-Kuhn-Tucker conditions
12	Dual Simplex Method and Sensitivity Analysis	Dual simplex method Sensitivity Analysis
13	Review: Final Exam	

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." *[Undergraduate Calendar, Sec 17.10.2]*