Department of Mathematics & Statistics
Concordia University

MAST 324
Introduction to Optimization
Winter 2017

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Office Hours: Tuesday-Thursday, 13:45-14:30 PM in LB 921-3.

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 50%
(2) Final Exam Part A 50%, Part B (midterm make up) 50%

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	