

**MAST 324**  
Introduction to Optimization  
*Winter 2016*

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**Office Hours:** Tuesday-Thursday, 13:30-14:30 in LB 915-3

**Textbook:** *Operations Research: Applications and Algorithms*, by Wayne L. Winston, Brooks/Cole, 4th Edition

**Final Grade:** (1) 10% Assignments + 20% Midterm Exam + 70% Final Exam **or**  
(2) 10% Assignments + 90% Final Exam, whichever is higher

**Chapters, Sections, and Topics:**

Chapter 3. Linear Programming: Tool for Solving Optimization Problems

Sections	Topics
3.1	What is a Linear Programming Problem (LPP)?
3.2	Graphical Solution of Two-Variable LP Problems
3.3	Cases of LPPs: Unique Solution, Many Solutions, No Solution

Chapter 4. The Simplex Algorithm: Method to Solve LPPs

Sections	Topics
4.1	How to Convert LPPs to Standard Form
4.2	Preview of the Simplex Algorithm, Basic Solutions, Basic Feasible Solutions
4.3	Direction of Unboundedness
4.4	Existence of Optimal Basic Feasible Solutions, Adjacent BF Solutions
4.5	Simplex Algorithm, Standard Form, Optimal Canonical Form
4.6	Simplex Algorithm to Solve Minimization Problems
4.7	Alternative Optimal Solutions
4.8	Unbounded LPPs, Direction of Unboundedness
4.11	Degenerate LPPs and Convergence of the Simplex Algorithm
4.12	Big M Simplex Method
4.13	Two-Phase Simplex Method
4.14	LPPs with Unrestricted in Sign Variables

## Chapter 6. Sensitivity Analysis and Duality

Sections	Topics
6.1	Graphical Introduction to Sensitivity Analysis
6.2	Expressing LPPs Optimal Tableau in Terms of the Initial LPPs
6.3	Sensitivity Analysis
6.5	Finding the Dual LP Problem to a given LP Problem
6.6	Economic Interpretation of the Dual LP Problem
6.7	Dual Theorem and its Consequences
6.10	Complementary Slackness Theorem

## Chapter 7. Transportation and Assignment Problems

Sections	Topics
7.1	Formulating Transportation Problems
7.2	Finding Basic Feasible Solutions for Transportation Problems
7.3	Transportation Simplex Method
7.5	Assignment Problem, Hungarian Method