

**MATH 437/537**  
**Operations Research (3 units)**

**Course Outline**

Topics	# of Weeks
<b>Overview of models and modeling (Chapters 1 &amp; 2)</b> What is an optimal decision? Preview of the entire course.	1.0
<b>Decision Theory (Chapter 15)</b> Single and multi-level decision analysis. Utility Theory.	1.0
<b>Linear Programming (Chapter 3, 4, 5, 6, 8 &amp; 9)</b> Modeling problems. Solution using the graphical method. Generalizing the graphical approach to higher dimensions. The Simplex Algorithm. Start sensitivity analysis. More on sensitivity analysis. Use of shadow prices/reduced costs. Economic interpretation. Transportation and assignment problems. LP formulations. Network problems. Review.	4.0
<b>Dynamic Programming &amp; Network Models (Chapter 10)</b>	1.0
<b>Integer Programming (Chapter 11)</b>	1.0
<b>Markov Chains, Markov Decision Processes (Chapters 16 &amp; 19)</b>	1.0
<b>Queuing Theory (Chapter 17)</b>	1.0
<b>Inventory Analysis (Chapter 18)</b>	1.0
<b>Nonlinear Programming and Global optimization issues (Chapters 12 &amp; 13)</b> Goal Programming/Multi-objective Optimization.	1.0
<b>Review and Wrap Up</b>	1.0
<b>Exams</b>	1.0

Textbook: Introduction to Operations Research 8<sup>th</sup> Edition, by Hillier and Lieberman

Adopted: Spring 2007