

<b>COURSE NUMBER:</b> IE 3011	<b>COURSE TITLE:</b> Optimization I
<b>TERMS OFFERED:</b> Fall	<b>PREREQUISITES:</b> Math 1371, 1372, 2372 and 2374
<b>TEXTBOOKS/REQUIRED MATERIAL:</b>  F.S. Hillier and G.J. Lieberman, Introduction to Operations Research, McGraw Hill, 2005.	<b>PREPARED BY:</b>  Shuzhong Zhang  <b>DATE OF PREPARATION:</b>  October 21, 2011
<b>COURSE LEADER(S):</b>	<b>CLASS/LABORATORY SCHEDULE:</b>  <b>CONTRIBUTION OF COURSE TO MEETING PROFESSIONAL OBJECTIVES:</b>
<b>CATALOG DESCRIPTION:</b>  Optimization models, data and solutions, linear programming, the simplex method, duality theory, sensitivity analysis, network optimization models, integer programming.	<b>COURSE TOPICS:</b> <ol style="list-style-type: none"> <li>1. Linear programming and solutions;</li> <li>2. The simplex method, sensitivity analysis, and the duality theory;</li> <li>3. Assignment and network optimization models;</li> <li>4. Integer, and mixed integer programming;</li> <li>5. Two-person zero-sum matrix game.</li> </ol>
<b>COURSE OBJECTIVES</b>	<ol style="list-style-type: none"> <li>1. To introduce students the basic models in optimization;</li> <li>2. To help students understand how to solve linear programming;</li> <li>3. To introduce students basic concepts of the duality theory and sensitivity analysis;</li> <li>4. To get students acquainted with the network optimization models, and integer programming models;</li> <li>5. To help students develop skills to apply linear and network optimization</li> </ol>

	models, to analyze the data, and to interpret the results.
<b>COURSE OUTCOMES</b>	<ol style="list-style-type: none"> <li>1. Students learn to model practical problems by linear, network, and integer programming models;</li> <li>2. Students learn basic solution methods, such as the simplex method;</li> <li>3. Students learn to use Excel to solve the problems numerically and to conduct sensitivity analysis;</li> <li>4. Students learn how to interpret the solutions;</li> <li>5. Students learn to use basic duality theory to analyze the zero-sum matrix game.</li> </ol>
<b>ASSESSMENT TOOLS:</b>	<ol style="list-style-type: none"> <li>1. 1 midterm examination and a final examination.</li> <li>2. Biweekly assignments.</li> </ol>