# SA305: Linear Programming

**Class website**: https://sites.google.com/site/sa305s2012/

**Important**: Check with your instructor – your section may cover topics in a different order, have more than two tests, etc.

| Day | Date | Reading before class | Topic |
|---|---|---|---|
| 1 | 1/10/2012 | 1.1 | Intro |
| 2 | 1/11/2012 | Handouts | What is OR? Case studies. |
| 3 | 1/13/2012 | 1.2 & 1.3 | Assumptions of linear models. Graphical solutions. Excel basics (rel pos, format). |
| 4 | 1/18/2012 | 2.1 & 2.3 | Resource allocation. NPS modeling format. Math formulation vs Excel tableau. Solver. |
| 5 | 1/20/2012 | 2.2 | Work scheduling |
| 6 | 1/23/2012 | 2.4 + handout on OR pitfalls | Blending problems. |
| 7 | 1/25/2012 | 2.5 | Production process models. |
| 8 | 1/27/2012 | 2.6 | Multiperiod WS & inventory models. |
| 9 | 1/30/2012 | Handout | Multiperiod finance models. |
| 10 | 2/1/2012 | 2.7 | Linearization of absolute value function: sensor placement models. |
| 11 | 2/3/2012 | 2.7 | Minimax and Maximin formulations. Application to game theory. |
| 12 | 2/6/2012 | 2.8 | Network models: min cost problems. |
| 13 | 2/8/2012 | 2.8 | Network models: shortest path problems. |
| 14 | 2/10/2012 | 3.1 | Integer programming: fixed charge models. |
| 15 | 2/13/2012 | | Review |
| 16 | 2/15/2012 | | TEST 1 |
| 17 | 2/17/2012 | 3.2 | IP: set covering models. |
| 18 | 2/22/2012 | 3.3 | IP: logic models. |
| 19 | 2/24/2012 | 3.4 | IP: TSP |
| 20 | 2/27/2012 | 6.1 & 6.2 | Solving systems of linear equations (review); BV vs NBV; BFS. Standard form. |
| 21 | 2/29/2012 | 6.3 | Unboundedness and existence of optimal BFS. |
| 22 | 3/2/2012 | Chapter 7 | Adjacency and extreme points = BFS |
| 23 | 3/5/2012 | 8.1 & 8.2 | Simplex Algorithm |
| 24 | 3/7/2012 | 2.8 | Min problems, URS constraints and equality constraints, alternative optimal solutions. |
| 25 | 3/9/2012 | 8.4 | Review of simplex method; two-phase simplex method (introduction). |
| 26 | 3/19/2012 | 8.4 | Two-phase simplex method (continued). |
| 27 | 3/21/2012 | 8.3 | Convergence questions for simplex algorithm |
| 28 | 3/23/2012 | | Review |
| 29 | 3/26/2012 | | TEST 2. |

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| 30 | 3/28/2012 | 9.2 | Dual LP |
| 31 | 3/30/2012 | 9.3 | Duality Theorems - strong duality |
| 32 | 4/2/2012 | 9.3 | Duality Theorems - complementary slackness |
| 33 | 4/4/2012 | 9.4 & 11.1 | Dual Simplex Method |
| 34 | 4/6/2012 | 9.6 | Economic interpretation of dual variables |
| 35 | 4/9/2012 | | Recap: Connection between dual variables, slack variables, solutions to the dual LP, shadow prices, etc. |
| 36 | 4/11/2012 | | More duality |
| 37 | 4/13/2012 | | Sensitivity analysis: graphical |
| 38 | 4/16/2012 | | Sensitivity analysis: algebraic |
| 39 | 4/18/2012 | | Sensitivity analysis: algebraic & Qualitative follow-on analysis |
| 40 | 4/20/2012 | | Qualitative follow-on analysis |
| 41 | 4/23/2012 | | Class Projects |
| 42 | 4/25/2012 | | Class Projects |
| 43 | 4/27/2012 | | Class Projects + SOFs |
| 44 | 4/30/2012 | | Review |
| Final | | | |

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