

Week	Date	Read	Topic 1	Topic 2	Topic 3	Homework
1	1-Sep	Ch. 1 (all), Ch. 2(review), Ch. 3.1-3.3	Intro to OR History (Morse) Recent Applications Where to Look for Info Instructor Info	Course Structure Optimization taxonomy LP history LP assumptions (3.1)	LP Graphical Solution (3.2) Special cases (3.3) Admin – student info Admin – student survey	p. 56: 1,4 p. 64: 3,5 p. 69: 1,2,3 Try: p. 69, 7
2	8-Sep	Ch. 3.3-3.12	Standard NPS formulation format Formulation I Product mix (3.4, 3.6, 3.7)	Formulation II Covering, Staffing, Scheduling (3.5) Blending (3.8)	Formulation III Multiperiod planning (3.10)	p. 73: 1 p. 76: 2, 6 p. 91:6,10 p. 103: 3;4
3	15-Sep	MPL Tutorial, Ch. 4.1-4.3, 4.12	Formulation IV Recourse Models (LINDO Handout)	MPL - algebraic model language intro, examples	Standard Form (4.1) Simplex Intro (4.2)	Handout, #4 (formulate only) Formulate and solve with MPL/CPLEX: p. 120: 49 p. 127: 3
4	22-Sep	Ch 4.5-4.6, 4.10-4.11,	Tableau I (4.3) Tableau mechanics, stopping criterion Tableau adjustments (4.4, 4.12)	Tableau II Alternative optima (4.5) Unbounded LPs (4.6) Degeneracy and cycling (4.9)	Degeneracy continued (4.9) Big M, Two-Phase (4.10, 4.11)	p. 143: 3,5 p. 148: #2, #5 p. 151: #3 p. 170: find initial BFS using Two-Phase
5	29-Sep	Ch. 6.2, 10.1-10.2 Ch. 6.5-6.11	Matrix form of simplex (6.2) Revised Simplex (10.1, 10.2)	Duality I Formulating the Dual (6.5) Economic interpretation (6.6) Dual Theorems (6.7)	Duality II Shadow prices/reduced costs (6.8) Complementary slackness (6.10)	p. 247: 2 (find z, x1, x2, s1, s2 via matrix formulas) p. 559:1 (use product form of inverse) p. 275: 5 p: 287: 2a (also show dual of the dual is the primal) p. 297: 6
6	6-Oct	Ch 6.10, Review	Duality III Elastic constraints/dual bounds Dual simplex/adding constraints (6.11)	Comprehensive Example I Formulation Dual MPL Setup	Comprehensive Example II Solution Analysis Sensitivity Project Handout, Discussion	p. 310: 2a class example, #2
7	13-Oct	Ch 7.1-7.3 (formulations only) Ch 8.1-8.3, 8.5, 8.6	Formulations: transportation, transshipment, assignment	Network terminology Min cost network flow formulation	Network simplex	p. 384: 5 p. 460: 2a p. 461: 3d, 3f

8	20-Oct	MIDTERM				
9	27-Oct	Ch. 9.1, 9.2	Network Simplex Cont'd Network Review	IP Formulation I Integral variables Logical conditions: fixed charge, either-or, if-then	IP Formulation II Limiting variables Economies of scale SOS variables	p. 494: 18, solve with MPL p. 497: 29
10	3-Nov	Ch. 9.3, 9.4, Handouts	IP Formulation III Covers Packs Partitions	LP relaxations Network problem integrality Solution implications Branch-and-bound: theory	Presolve methods Strong formulations Branch priorities Cuts	p. 494: 18, solve with MPL, manual branch- and-bound p. 494: 14, solve with reduction rules
11	10-Nov	MPL Manual pp. 90- 107, CPLEX Handout, Ch. 12.1-12.4	Cuts CPLEX MIP Options	Detailed Example MPL Formulation CPLEX options Solution analysis and sensitivity	NLP I Introduction/Taxonomy Convexity/Concavity Line Searches	p. 543: 3 p. 651: 2 p. 659: 6
12	17-Nov	Ch 12.5-12.8	NLP II Multivariate Unconstrained Optimization Gradients; steepest ascent	NLP III Convergence of steepest ascent; alternatives Lagrange multiplier methods	NLP IV Karush-Kuhn-Tucker Conditions	
13	24-Nov	Ch 12.9, 12.11	NLP V Quadratic Programming	NLP VI Survey of NLP Methods	NLP VI Survey of NLP Methods (Cont'd)	
14	1-Dec	Review	Total Course Picture Formulation	LP Theory Network Theory	IP Theory NLP Theory	
	20-Dec	FINAL				