

Week	Date	Read	Topic 1	Topic 2	Topic 3	Homework
1	Sep 1	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	Sep 8	Ch. 3.3-3.12	Standard NPS formulation format Formulation I Product mix	Formulation II Covering, Staffing, Scheduling Blending	Formulation III Multiperiod planning	p. 71: 1 p. 72: 2, p 76:6 p. 93:6,10 p. 104: 3;4
3	Sep 15	MPL Tutorial, Ch. 4.1-4.2, 4.14	Formulation IV Recourse Models (LINDO Handout)	MPL - algebraic model language intro, examples	Standard Form Simplex Intro	Handout, #4 (formulate only) p. 127: 3 Formulate and solve with MPL/CPLEX: p. 123: 57
4	Sep 22	Ch 4.7-4.8, 4.11-4.13,	Tableau I Tableau mechanics, stopping criterion Tableau adjustments	Tableau II Alternative optima Unbounded LPs Degeneracy and cycling	Degeneracy continued Big M, Two-Phase	p. 149: 3,7 p. 154: 2, 8 p. 158: 3 p. 178: 3, find initial BFS using Two-Phase
5	Sep 29	Ch. 6.2, 10.1-10.2 Ch. 6.5-6.11	Matrix form of simplex Revised Simplex	Duality I Formulating the Dual Economic interpretation Dual Theorems	Duality II Shadow prices/reduced costs Complementary slackness	p. 275: 2 (find z, x1, x2, s1, s2 via matrix formulas) p. 567:1 (use product form of inverse) p. 301: 5 p: 313: 2a (also show dual of the dual is the primal) p. 322: 6
6	Oct 6	Ch 6.10	Duality III Elastic constraints/dual bounds Dual simplex/adding constraints	Review		p. 335: 2a class example, #2

	Oct 13	COLUMBUS DAY	NO CLASS			
7	Oct 20	MIDTERM				
8	Oct 27	7.1-7.3 (formulations only), 8.1-8.5	Network terminology Min cost network flow formulation	Network formulations: transportation, transshipment, assignment Maximum weight closure	Critical Path Method (CPM) CPM primal, dual formulations CPM with expediting (new)	p. 403: 5 p. 472: 2a p. 472: 3d
9	Nov 3	Ch. 9.1	Intro to max-min models Shortest path with interdiction CPM with interdiction and expediting	General max-min problem formulation	IP Formulation I Integral variables Logical conditions: fixed charge, either-or, if-then	p. 472: 3g in-class HW problem p. 504: 18, solve with MPL
10	Nov 10	Ch. 9.2, 9.3, 9.4	IP Formulation II Limiting variables Economies of scale SOS variables	IP Formulation III Covers Packs Partitions	LP relaxations Network problem integrality Solution implications Branch-and-bound: theory	p. 507: 29 p. 504: 18, solve with MPL, manual branch-and-bound
11	Nov 17	MPL Manual pp. 90-107, CPLEX Handout	Presolve methods Strong formulations Branch priorities Cuts	Cuts CPLEX MIP Options	Constraint-satisfaction problems In-class challenge; MIP formulations	p. 503: 14, solve with reduction rules p. 549: 3 Sudoku problem
12	Nov 24	Ch. 4:16; 11.13	Handling multiple criteria: Goal Programming I	Goal Programming II	Pareto optimality; Efficient frontiers and efficient points	TBD
13	Dec 1	Ch. 11.10; handouts	“Generalized” Sensitivity Analysis	Quadratic Programming; Portfolio Models	Commercial NLP Methods and Solvers	TBD
14	Dec 8	Review	Total Course Picture Formulation	LP Theory Network Theory IP Theory	Dual and Max-Min Theory Multicriteria theory	PROJECT DUE
	Dec 15	FINAL				