

Spr.04: CS 350: Linear Optimization

[PS] Papadimitriou and Steiglitz, Combin. Optimization : Algorithms and Complexity, PH(I), 2001 or later ed.

[GD] George Dantzig, LP and Extension, Princeton Univ Press

[KM] K G Murty, Linear Programming

[VC] V Chavtal, Linear Programming

All books placed in study room section.

Week	Topics	Refs
1	Model formulation; course overview Linear equations and inequalities; basis in vector space, basic solution	PS-1;GD-3,4
2	Graphical method in two dimension; Simplex algorithm, finiteness;	PS-2;GD-4,5
3	Obtaining initial solution - SM; constructing bfs from nbfs; Pricing and column representation	PS-2;GD-5
4	Revised SM - method of multipliers; discussion of HWs	PS-4.1,4.2
5	Revised SM; Degeneracy Geometry of LP	PS-4.1 - 4.3;PS-2.7 PS-3; GD-6
6	Duality; complementary slackness;	PS-3; GD
7	Sensitivity Analysis: change in constraint coefficients or cost	PS-3; GD-11,12
8	Variants of of the Simplex algorithm: Primal-Dual and Dual Simplex	PS-3.6, PS-5
9,10	Specialization to network flow problems: minimum cost flow and assignment problems	PS-4.3,5.4,6,7,11.2
11	Two person games and LP; pure and mixed strategies	GD-13
12,13	Complexity; Interior point method for LP	PS-8
14	Quadratic/Non-linear programming via LP	
15	Special/Additional topics:- Decompositon Approximation Branch-and-Bound	PS-4.4 PS-17 PS-18

Evaluation:

- 2 Quiz 10 marks each
- 1 Midsem 20 marks
- 1 Project 10 marks
- 1 Endsem 50 marks