ORIE 630: MATHEMATICAL PROGRAMMING I

Fall 2005

Instructor: Mike Todd (miketodd@cs.cornell.edu, 229 Rhodes Hall, 255-9135)
Teaching Assistant: Damla Erdogan (dse8@cornell.edu, 296 Rhodes Hall)

Lecture Schedule: Tuesdays & Thursdays, 10:10-11:25, 111 Upson Hall
Recitation Schedule: Wednesdays, 2:30-3:30, 253 Rhodes Hall

Office Hours for Mike Todd: Mondays and Wednesdays 1:30-2:30, 229 Rhodes Hall
Office Hours for Damla Erdogan: To be announced

Prerequisites: advanced calculus and elementary linear algebra, and "mathematical maturity"

Course Requirements: There will be weekly problem sets (25%); responsibility to provide edited scribe notes for two lectures (10%); mid-term exam (25%), in-class final exam (35%), and lecture-recitation participation (5%).

Textbook: There is no required textbook. The class will refer to a number of sources throughout the semester, including

- D. Bertsimas and J. Tsitsiklis, "Introduction to Linear Optimization," Athena Scientific, 1997;
- V. Chvátal, "Linear Programming," Freeman, 1983;
- various handouts prepared for this and previous iterations of the course, which will be available on the course web page (under construction),

  `www.orie.cornell.edu/~miketodd/or630 ;`
- the scribe notes prepared for the lectures in this class.

This course will give a rigorous treatment of the theory and computational techniques of linear programming and its extensions, including formulation, duality theory, algorithms, sensitivity analysis, network flow problems and algorithms; theory of polyhedral convex sets, systems of linear equations and inequalities, and the Farkas Lemma; and exploiting special structure in the simplex method and computational implementation. Topics covered will include the ellipsoid algorithm, interior-point methods, and computational complexity issues related to optimization problems.