IEOR E6613: Optimization I  
Fall 2012

Instructor: Vineet Goyal, vgoyal@ieor.columbia.edu  
Teaching Assistant: Brian Yin Lu, yl2662@columbia.edu

Schedule: TR, 10:10am-11:25am, 337 Mudd  
Office Hours: Monday 4-6pm, 304 Mudd or by appointment.  
TA Office Hours: TBA

Course Website: https://courseworks.columbia.edu/

Description. This course provides a rigorous introduction to the theory of linear optimization. The goal of the course is to develop a deep understanding of the algorithms as well as structural properties such as duality and geometry of linear programming. Below is a tentative list of topics

1. Linear Programming
   (a) Geometry of Linear Programming
   (b) Duality
   (c) Simplex Algorithm
   (d) Sensitivity Analysis
   (e) Network Problems

2. Complexity of Linear Programming
   (a) Equivalence: Separation and Optimization
   (b) Ellipsoid Algorithm

3. Interior Point Algorithms

4. Integer Programming: Formulations and Basic Algorithms

Prerequisites. Linear Algebra, Basic calculus.


Organization and Grading.

Homeworks. There will be approximately 7 homeworks that must be individual work and submitted at the start of the session it is due. Students may discuss homework exercises with others but no person should rely on a written solution of a homework exercise, even if one is available. If you discuss a problem with anyone and use his/her ideas in any way, then you must acknowledge this in your solution. **NO Late submissions** will be accepted.

Midterm and Final. The course will have a midterm and a final exam.

The grade will be assigned using the following weights.

- Homeworks: 30%
- Midterm: 30%
- Final: 40%