IEOR E4004: Intro to OR: Deterministic Models Spring 2016

Instructor. Shipra Agrawal, shipra@ieor.columbia.edu

Schedule. MW, 8:40am-9:55am, Location: TBA

Office Hours: Wednesday 3-4pm, 423 Mudd or by appointment.

TA Office Hours: TBA

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

Description. This class is an introduction to the fundamental methods in Operations Research. Topics covered will include linear programming, network flows, dynamic programming, and nonlinear programming. We will discuss both the underlying theory as well as the applications for all these fundamental topics. A special emphasis will be on learning how to model real-world problems as an optimization problem in one of these frameworks. Students will learn modeling skills, and develop the ability to build, analyze, and reason logically with models. They will also learn to design and analyze algorithms, and to distinguish good algorithms from not-so good ones. They will also appreciate the capabilities and limitations of deterministic models in operations research.


Organization and Grading

Homeworks. There will be approximately 8 – 10 homeworks. You may discuss homework exercises with others, but you have to write your own solutions.

Midterm and Final. The course will have a midterm and a final exam. Midterm will be held in class on March 9th. The date for the Final will be determined by the Registrar. The grade will be assigned using the following weights.

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

Tentative list of topics

1. Linear Programming: Modeling, Simplex Method, Duality Theory, Sensitivity Analysis
2. Network Flows
3. Integer Programming: Formulations and Algorithms
4. Dynamic Programming
5. Non-linear Programming