SYLLABUS

TuTh 3:00-4:20
King 221

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Office hours:  W 10:00-12:00, W 3:00-6:00, and by appointment.

Objectives: We will spend the semester studying linear programming and several related topics (integer programming, combinatorial optimization, constraint programming, dynamic programming, and nonlinear programming). Throughout the semester, we will concentrate on both theory and applications. One of my goals is to help you become proficient in the art of mathematical modeling (which entails taking a “real-world” problem, determining what are its most important features, and representing them using mathematics). Another is to teach you the mathematical tools needed to solve certain types of mathematical models.

Required texts: Linear Programming by V. Chvátal.

Homework: Homework will be collected at the beginning of class on Fridays. Most of the assignments will contain conceptual exercises, mechanical exercises, and exercises that require the use of a computer. I encourage you to discuss the assignments with your classmates, but I insist that you write and submit your own solutions. Absolutely no late homework will be accepted without a valid excuse (an illness, an emergency, etc.).

Exams: There will be two open-text, open-notes take-home exams. I will distribute them on October 5 and November 16.

Final Project: The final project will give you the opportunity to do some modeling, to do some programming, or to write a research paper on a topic that interests you. Ten years ago, Jason Smith and Garic Schoen took a linear programming-based method for diagnosing breast cancer and modified it so that it could be used to solve disputed authorship problems. Jason and I worked on it for another year and wrote an article on it for The American Mathematical Monthly. Six years ago, Michael Cardiff and Gwyneth Hughes developed an integer programming approach for planning an itinerary for a visit to an amusement park. A year later, we wrote an article entitled “Maximizing fun at a theme park.” It was published in The UMAP Journal.

Each team of students must give a 15–30 minute presentation of their project and submit a 5–10 page written report. Presentations will be held during the last two weeks of class. The written reports will also be due on December 21 (no later than 9 pm).

Grading: The homework assignments will be worth a total of 25% of the final grade. Each exam will be worth 25%. The final project will be worth 25%.

Help: Please feel free to ask me questions about the course (or anything else). If you find my office hours inconvenient, you are welcome to schedule an appointment (or just drop by).

Web sites: See http://www.oberlin.edu/math/faculty/bosch.html for some interesting web sites.