

Instructor: Lynne Butler's home page is www.haverford.edu/math/lbutler.html.

Course description: The object of the course is the understanding of the mathematics of optimization problems with a finite number of variables subject to constraints. We shall cover the areas of linear programming, matrix games, problems of network flow, and nonlinear programming. Although these areas have many practical applications (google *Math That Helps Nearly Everyone Make Decisions*), our emphasis will be on the structure of optimal solutions, algorithms to find them, and the underlying theory that explains both.

References: Your primary references are lecture notes. For a more elementary exposition of a topic, consult Strayer's text "Linear Programming and Applications"; for a more verbose exposition of a topic, consult Nering and Tucker's text "Linear Programming and Related Problems"; for a more advanced exposition of a topic, consult Chvatal's text "Linear Programming". These books are on reserve for Math 210 at the [Science Library](#) reserves. To explore resources on the Web, visit gametheory.net and google *Linear Programming FAQ*.

Weekly assignments: Each of the 13 assignments will be posted by Friday on Blackboard (see www2.haverford.edu/acc/docs/network/blackboard/studentbasic/studentbbbasic.htm), and is due the following Friday at the start of class. No late papers are accepted. Solutions will be posted promptly and should be studied before Monday's lecture.

You are encouraged to discuss your ideas on homework problems with peers and instructors, but you are not permitted to refer to any notes from such discussions while preparing the solutions you plan to submit for grading. Divide the time you spend solving a homework problem into 3 stages: first work alone and record your preliminary ideas on white paper; then work with peers and instructors and record shared ideas on colored paper; finally resume working alone on white paper without looking at anything written on colored paper.

The problems sets are meant to be challenging; you should plan to spend six hours on each assignment. If you find yourself spending more than six hours, please ask for assistance. The problem sets are meant to be illuminating, not overwhelming. Ask yourself questions and draw pictures when possible. The problems should be done without consulting Internet sources (except material distributed by the instructor on Blackboard) and without making use of computer software (except *Pivot*, at www.haverford.edu/math/lbutler/home.html).

Grading: Grades will be determined by performance on homework (20%), two midsemester tests (15% each), two take home tests (5% each) and a self-scheduled final (40%). The midsemester tests will be given in class on 3 March 2008 and 14 April 2008. After taking the in-class test, students will be given a second copy to take home and try again under less time pressure. The take-home tests are due on 5 March 2008 and 16 April 2008. Students who think they may need accommodations in this course because of the impact of a disability should contact Rick Webb (rwebb@haverford.edu, 610-896-1290) to verify their eligibility.

Lectures, Discussion Sessions, and Office Hours: Lectures will be presented Monday and Friday 12:35–2 pm in Koshland E309. Optional discussion sessions at Haverford and Bryn Mawr will be scheduled on Wednesday afternoon. Lynne Butler will hold office hours Monday and Friday 2:05–3 pm in Hilles 212. Should these be inconvenient for you, feel free to make an individual appointment. The lecturer may be reached in her office (896-1300), at home (609-818-9540) or by email (lbutler@haverford.edu).