

MATH 171B: Mathematical Programming

Spring Quarter 1999

MWF 9:05am–9:55am YORK 4050A

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Problems in all areas of mathematics, applied science, engineering, economics, medicine and statistics can be posed as *optimization problems*. An optimization problem begins with a set of independent variables or parameters, and often includes conditions or restrictions that define acceptable values of the variables. Such restrictions are known as the *constraints* of the problem. The other essential component of an optimization problem is a single measure of “goodness”, termed the *objective function*, which depends in some way on the variables. The solution of an optimization problem is a set of allowed values of the variables for which the objective function assumes its “optimal” value. In mathematical terms, this usually involves maximizing or minimizing.

Math 171B deals mainly with *nonlinear* programming, which involves the minimization of a *nonlinear* function, possibly subject to *nonlinear* constraints. For historical reasons, this subject is often also known as *mathematical programming*. However, it must be emphasized that *mathematical* programming has no direct connection with *computer* programming.

Lecture notes will be available from Soft Reserves. Students will be assigned a computer account on `sdcc14.ucsd.edu` (*iNSci14*, a Sun Sparc Ultra-4 running SunOS 5.6 Unix). Almost all homework assignments will require the use of the interactive matrix package MATLAB, although no prior knowledge of MATLAB is assumed. MATLAB enables the student to concentrate on the fundamental ideas of linear programming without becoming distracted by the rigors of mental arithmetic.

The course will be graded on the homework assignments, two midterm examinations and a final examination, according to the following guidelines:

Written HW:	30%
Midterm #1 (Friday April 16):	15%
Midterm #2 (Friday May 14):	15%
Final (Appointed time during finals week):	40%

1. All HW assignments will count towards the final grade (i.e., none can be dropped). Late HW will not be accepted.
2. In order to receive credit you must complete all the MATLAB homework assignments. *This rule will be strictly enforced.*
3. There will be no make-up exams. If you miss a midterm with an excused absence (i.e., illness with a note from a doctor), the other midterm and the final exam will be weighted accordingly.