IOE 611 Syllabus

Instructor: Professor Katta G. Murty, 232 IOE Bldg., 763-3513, katta.murty@umich.edu

Prerequisites: A course in linear programming, equivalent to IOE 510

Time & Room: Tu, Th 9 AM to 10:30 AM, 2717 IOE.

Course objectives: To expose the student to nonlinear models, their applications, how to construct them, and to use algorithms for solving them satisfactorily.

Transparencies: The course will be taught using overhead transparencies. Students can access copies of the transparencies on the WWW using the address:
http://www-personal.engin.umich.edu/~murty/611/index.html

Books:
2. K.G. Murty, Linear Complementarity, Linear and Nonlinear Programming, Helderman-Verlag, 1988. Can be seen on the web at:
   http://ioe.engin.umich.edu/people/fac/books/murty/linear_complementarity_webbook/

Contents:
1. Formulation of continuous optimization models, curve fitting, parameter estimation, $L_1, L_2$ and $L_\infty$ - measures of deviation. Difference between linear and nonlinear model building. Examples.
3. Theorems of alternatives for linear systems.
5. Optimality conditions.
6. Quadratic programming and complementary pivot methods.
8. Line Search methods.

Work in the course: Homeworks every week. One midterm (in the class on 19 Feb 2004) and final (1:30 PM to 3:30 PM, 23 April 2004). A computer project.

I would like each student to study one nonlinear programming paper from the literature carefully and give a 30 minute lecture on it to the whole class towards the end of the term.

The approximate contribution to the final grade will be: Homeworks (0.2), Midterm (0.25), Final (0.35), Computer project (0.1), lecture (0.1).