Course Syllabus Spring Semester 2010

MAT 6603.001 Optimization Techniques in Oper. Research 7:00-8:15 pm MS 2.02.52

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MY SPRING 2010 TEACHING SCHEDULE:
MAT 5293.001 MW 4:00-5:15 pm MS 2.01.06 Numerical Linear Algebra
MAT 5663.001 MW 5:30-6:45 pm HSS 3.04.06 Ordinary Differential Equations II
MAT 6603.001 MW 7:00-8:15 pm MS 2.02.52 Optimization Techniques/Operations Research

Textbook: There is no required textbook. Instead I will use my own notes and several references including Numerical Methods for Unconstrained Optimization and Nonlinear Equations (Dennis and Schnabel), Numerical Methods for Least Squares Problems (Bjorck), and several survey articles from the literature.

GRADING: Beginning graduate students should review the pages in the Graduate Catalog relating to grades. Problem sets assigned on a (roughly) weekly basis will determine 45% of your grade, an in-class midterm exam 25%, and a final exam 30%. At my discretion, there may be a final assignment instead of an in-class final exam; it will consist of your reading through a survey article in the field and making a written/oral presentation. Note that class will meet during the final exam period regardless. This is a graduate course and I reserve the right to make minor modifications to the grading scheme to reflect how the class as a whole progresses with the material.

COURSE DESCRIPTION: 6603 Optimization Techniques in Operations Research (3-0) 3 hours credit. Prerequisite: MAT 2213, MAT 2233, or consent of instructor. Analysis and application of optimization techniques in operations research. Emphasis on linear programming, nonlinear programming, and integer programming.

COURSE OBJECTIVES: The course is designed to enable a student to master the theory and applications of linear and nonlinear optimization. Note the prerequisites: Calculus III and undergraduate linear algebra. It is essential that you are well versed in these two areas, inasmuch as much of the theory of optimization consists of extending the ideas of multivariable calculus to very high dimensional spaces and even to infinite dimensional spaces (variational methods). There is no formal programming component to the course – our goal is to understand the mathematics of the various algorithms, although we cannot fail to address implementation issues. In the past, some students have found it useful for visualization purposes to use a meta-language such as Matlab or Sage. Time permitting, at the end of the semester we may look at some of the recent work on L1 optimization.

DATES TO REMEMBER:
January 11 - First Day of Classes
January 27 - CENSUS DATE
February 10 – In-class midterm exam
February 19 – Midterm Grades due
March 15-19 – Spring break
March 22 – Last Day to drop
May 5, Wednesday, 5:00-7:30pm - Final Exam