



APPLIED MATHEMATICS 425 "INTRODUCTION TO OPTIMIZATION"

Calendar Description: H(3-1T)

Examples of optimization problems. Quadratic forms, minimum energy and distance. Least squares, generalized inverse. Location and classification of critical points. Variational treatment of eigenvalues. Lagrange multipliers. Linear programming.

Prerequisite: Mathematics 311; and Mathematics 353 or Applied Mathematics 309 or Mathematics 331.

Syllabus

<u>Topics</u>	<u>Number of Hours</u>
Unconstrained optimization: one variable, several variables	9
Convex optimization: convex sets and convex functions optimal conditions, geometric programming	4
Introductory numerical methods: one dimensional searches, Newton's method (in several variables), steepest descent	5
Practical numerical methods: conjugate gradient, quasi-newton	5
Least squares: least squares fit, minimum norm solutions	5
Linear programming: simplex method, primal-dual method	5
Constrained optimization: penalty methods, Lagrange multipliers	5
TOTAL	<u>36</u>
