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Linear and Nonlinear Programming

MATH-434*

The course is concerned with theory and technique of optimization of functions of several variables, restricted by equality and inequality constraints.

Textbook: *Class Notes*

Prerequisite: MATH-221*/223* or 280*/281*; 110 or 111.

Instructor: N. M. Rice

Evaluation:	Weekly assignments	10%
	Midterm test	20%
	Final examination	70% (or 100%)

Outline:

I. LINEAR PROGRAMMING:

Convexity and basic theory

Simplex algorithm

Duality, complementary slackness, sensitivity

II. UNCONSTRAINED NON LINEAR OPTIMIZATION:

Convexity and descent algorithms

Simplex search

One-dimensional search

Steepest descent

Newton's method

Conjugate directions

Quasi-Newton methods

III. CONSTRAINED NON-LINEAR OPTIMIZATION:

Elementary Kuhn-Tucker conditions

Gradient projection and reduced gradient projection methods

Penalty methods

Convexity and duality

Lagrangian and augmented Lagrangian techniques