Course Outline
Department of Mathematics and Statistics
Minnesota State University, Mankato

Math 428 Linear Optimization Methods (4 semester hours)

Course Description:

Simplex method and its variants, duality, sensitivity analysis, interior-point methods, quadratic programming and linear complementarity problems. Applications such as classification problems and game theory with linear optimization software.

Prerequisites: MATH 122, MATH 247

Learning Outcomes:

Students will be able to:

1. Apply analytic, qualitative, and quantitative methods to build linear optimization models for a variety of practical problems.
2. Identify the appropriate method to use on solving linear optimization problems.
4. Apply linear optimization to solve approximation and classification problems in engineering, statistics and economics.

Content Outline:

1. Linear optimization models for variety of problems in engineering, economics and science computation.
2. Jordan exchange and simplex methods for linear optimization.
3. Weak and strong dual theorems of linear optimization and applications.
5. Sensitivity analysis and parametric linear optimization.
6. Interior-point methods.
7. Extend linear optimization- quadratic programming and Complementarity Problems and their applications.

Textbook/Related Readings/Materials:

Michael C. Ferris, Olvi L. Mangasarian, and Stephen J. Wright, Linear programming with MATLAB;
Dimitris Bertsimas and John N. Tsitsiklis, Introduction to linear Optimization.