

ENGR 510

ENGINEERING OPTIMIZATION: METHOD/APPLICATION

Offered every Fall

*Pre reqs: MATH 229 & MATH 261
(Matrices/Linear Equations &
Calculus III) or equivalent - review
provided during the course*

DESCRIPTION

In this introductory optimization for all engineers, you will learn how to utilize optimization to answer critical questions and gain an understanding of the underlying concepts behind today's most effective optimization tools.

BENEFITS

Optimization models seek to answer what is best under what is possible. You will develop both the theoretical and practical knowledge to create, solve, and interpret optimization models from a broader range of engineering domains.

COURSE OBJECTIVES

Topics include linear programming, simplex algorithm, nonlinear optimization, interior-point and penalty approaches, derivative-free methods, genetic algorithms, and optimization of systems. A broad range of examples is shown, including problems in transportation, scheduling, machine learning, mechanics, and aerospace.

Students successfully completing this course will be able to:

- Classify the variety of optimization problems from both a problem formulation and application perspective
- Construct an optimization model from a first-principles perspective
- Select the appropriate optimization strategy to solve complex engineering optimization problems
- Create Matlab (or similar) code to implement some of the basic methods and utilize state-of-the-art solvers

