

COURSE INFORMATION

Objectives:

To learn: Theory, Algorithms, Applications of Nonlinear Optimization, i.e. for minimizing an objective function that depends nonlinearly and continuously on unknown variables. Introduction to convexity theory will be included.

Intended Audience:

Prerequisites:

One of: CO 350 and MATH 138/148; CO 352/CM 340; or CO 355. (Not open to General Mathematics students. Note: MATH 237/247 is recommended.)

Textbook:

Convex Optimization, Stephen Boyd and Lieven Vandenberghe, Cambridge University Press

Course Web Page:

The course web page can be found at:

<http://orion.math.uwaterloo.ca/~hwoikowi/henry/teaching/w10/367.w10/index.shtml>)

MATLAB:

The MATLAB software package will be used to supplement the course material. Although you will NOT be tested on MATLAB, there will be questions on assignments that will require the use of MATLAB.

Assignments:

You will be asked to hand in **6** assignments. the assignments are due at the beginning of class of the due date. Late assignments will not be accepted.

Outline:

In 2010, this course concentrated on Convex Optimization. This included the basics theory of convex sets and functions. Then, duality and optimality conditions were covered. The second half of the course concentrated on numerical algorithms.

Throughout the course, the assignments included programming problems using the CVX package that is based on MATLAB.

Students needed an elementary knowledge of linear algebra and vector calculus. The assignments gave the students practice in numerical linear algebra, basic calculus, and some elementary real analysis.

The numerical assignments involved mid-level programming skills and some modelling ability.