EENG 4010.002, 5940.002, 5940.600 - Optimization Theory
Fall 2020

Instructor: Colleen Bailey PhD, NTDP B252, Colleen.Bailey@unt.edu

Office Hours: T 11:00 AM to 12:30 PM or by appointment, REMOTE

Lecture: MW 5:30 PM to 6:50 PM; REMOTE

TA: Daniel Zhang, shengjunzhang@my.unt.edu

Prerequisite: Linear Algebra and Probability Theory

Course Description: Learn the theory behind, application of, and algorithms for convex optimization.

Textbook: (required)
S. Boyd and L. Vandenberghe, *Convex Optimization*, Cambridge University Press, 2004.
https://web.stanford.edu/∼boyd/cvxbook/bv_cvxbook.pdf

Reference: (optional)
D. P. Bertsekas, *Convex Optimization Thoory*, Athena Scientific, 2009.
S. Boyd and L. Vandenberghe, *Introduction to Applied Liner Algebra: Vectors, Matrices, and Least Squares*, Cambridge University Press, 2018.
https://web.stanford.edu/∼boyd/vmls/vmls.pdf
Y. A. Rozanov (R. A. Silverman), *Probability Theory: A Concise Course*, Dover Publications, 1969.

Course Outline: (tentative)

Topic 1 ..... Introduction
Topic 2 ..... Convex Sets
Topic 3 ..... Convex Functions
Topic 4 ..... Convex Optimization Problems
Topic 5 ..... Duality
Topic 6 ..... Approximation and Fitting
Topic 7 ..... Statistical Estimation
Topic 8 ..... Geometric Problems
Topic 9 ..... Unconstrained Minimization
Topic 10 ..... Equality Contrained Minimization
Topic 11 ..... Interior-point Methods

Grading: (tentative)
Homework 30%
Exams 70%

Course Objectives: To recognize or formulate and solve convex optimization problems.

Canvas: Course material and grades will be maintained on the course Canvas site. You should check this page often to keep current on important information. *https://unt.instructure.com*

Course Policies:

- Homework is due at the beginning of class. Homework turned in after class will be penalized 50%. No homework accepted after 24 hours.
- No make up quizzes or exams will be offered unless prearranged with the instructor for a university approved absence.
- You have one week to contest any grade once returned.

Rights and Responsibilities:

- Students are expected to communicate to the instructor any issue regarding their performance in class ahead of time.
- Students aware of an authorized absence from a scheduled class or exam (religious observance, military service, official university function, COVID19, etc.) should notify the instructor as soon as possible according to UNT Policy 15.2.5.
- Students with disabilities should inform the instructor of their needs at the beginning of the semester according to UNT Policy 18.1.14 in order to receive proper attention and accommodations.
- Cheating and academic dishonesty will not be tolerated. Any student found to have participated in academic dishonesty will receive and F in the class, and may be subject to further disciplinary action. Acts of academic dishonesty include: academic fraud (e.g. changing solutions to appeal a grade), copying or allowing one's work to be copied, fabrication/falsification, plagiarism, sabotage of others' work, substitution (e.g. taking an exam for someone else). For more details, see UNT Policy 18.1.16.
- Letter grades will not be assigned until the end of the term, after the final exam has been graded. Any letter grade assignment posted before the end of the class should be regarded as tentative and subject to change.