Instructor:
Daniel J. McDonald

Purpose:
This course focuses on algorithms for solving convex optimization problems and the implications for statistical estimation.

Prerequisites:
- linear algebra (vectors, matrices, inverse, eigenvalues/decompositions, positive (semi)definiteness)
- multivariable calculus (gradient, hessian)
- undergraduate statistics (basic estimation and inference, linear regression, probability theory)
- R/Python (loops and flow control, functions)

Resources:

Topics:
1. convex sets and functions
2. canonical problems
3. first order numeric optimization
4. Duality and KKT conditions
5. Glimpse of 0th/2nd order methods
6. Coordinate descent, ADMM
7. Path algorithms and regularized statistical models

Content:
Lectures and homeworks will focus on both mathematical understanding and coding techniques.