Instructor: Prof. Chun-Hung Liu  
Office: ED 703 (7th Floor), Phone: 03-5712121 ext. 54512  
Office Hours: Wed, 9:00am-12:00pm (or anytime if you can see me in my office or by appointment)  
Email: chungliu@nctu.edu.tw  
Class Webpage: e3 campus or http://web.it.nctu.edu.tw/~chungliu  
Teaching Assistant: TBD (Lab: ED 717)

Required Textbook:


Reference Book:


Prerequisites:  
(undergraduate) Linear Algebra and good knowledge of probability is helpful.

Course Overview  
Convex optimization relates to a class of nonlinear optimization problems where the objective to be minimized and the constraints are both convex. Convex optimization problems are attractive because a large class of these problems can now be efficiently solved. Non-convex problems (combinatorial optimization, integer programming) using convex approximations that are more efficient than classical linear ones. This course covers some convex optimization theory and algorithms, and will focus on formulating and solving convex optimization problems in applications arising in a variety of fields (e.g., analysis, design and control of complex systems, machine learning, applied statistics, financial engineering, communication theory, signal processing, circuit design, combinatorial optimization, computational geometry, computational biology, etc.).
Course Outline

Lecture 0: Course Overview (What will be covered in this course?) approx 1 Week
Lecture 1: Convex Set approx 1 Week
Lecture 2: Convex Function approx 2 Weeks
Midterm I: Mid October
Lecture 3: Convex Optimization Problems approx 2.5 Weeks
Lecture 4: Duality approx 2.5 Weeks
Midterm II: Mid/Early December
Lecture 5: Unconstrained Minimization approx 2 Weeks
Lecture 6: Equality Constrained Minimization 1.5 Week
Lecture 7: Interior-point Methods 2.5 weeks
Final Exam: Mid January

Grading

- Homework Assignments and Discussions 20%
- Two Midterms 45%
- Final Exam/Project 35%

Homework and Project Policy
Homework will be typically given every two or three weeks, and should be turned in on the due day. Late homework and project will NOT be accepted except you have an exceptional situation which makes you delay your work. Students are encouraged to try the homework problems on their own, and then discuss their understanding and solutions with other students. Directly copying the homework and project results of other people does not help you understand the course content and may result in ZERO credit for that homework if discovered.

Academic Honesty
As a graduate student of NCTU, you have agreed to abide by the University academic honesty policy, A Culture of Honesty, and the Student Honor Code. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

Extra Help
Do not hesitate to come to my office during office hours or by appointment to discuss homework problems or any aspect of the course. Most of the class information will be posted on the class webpage.

University Attendance Policy
A student who incurs an excessive number of absences may be withdrawn from a class at the discretion of the professor.