CAAM 378
Introduction To Operations Research And Optimization

Fall 2014 · Rice University

Lectures: Tues/Thurs: 1:00-2:15PM, Room DCH 1064

Web Site: `http://www.caam.rice.edu/~yzhang/caam378`

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Office Hours: see the website for details

Objectives: Students learn how to formulate application problems into mathematical optimization models in which one seeks to minimize or maximize an objective function subject to constraints, and to solve basic optimization problems using computer algorithms or modeling languages.

Outcomes: – Formulate mathematical optimization models for applications (including linear, mixed-integer and network optimization models).
– Understand basic steps of the simplex method for the solution of linear programs.
– Solve linear (including mixed-integer and network) optimization problems
– Solve linear and nonlinear optimization problems via Newton's method

Prerequisites: MATH 212 and (CAAM 335 OR MATH 211 OR MATH 355).
You should be familiar with multivariable calculus and basic matrix operations (including solving linear systems of equations), and be able to write MATLAB programs.

Assignments: – Problem sets or projects will be assigned roughly weekly and due in a week in class.
– Three problem sets or projects are *pledged* that must be completed totally independently, but you can use your notes and books.
– On unpledged assignments, you may collaborate on ideas and methodologies, but your write-ups must done independently. No copying (even with cosmetic alternations) is allowed.
–*You may not consult solutions from previous sections of this class.*

Late Policy: – You may have 2 free late submissions on unplugged assignments up to one class period. Subsequent late submissions will be subject to 20% penalty each.
– Works submitted at 5pm of the due dates are accepted at the instructor's discretion.
– No late submissions will be accepted after one class period without a valid written excuse.
– The two free 'lates' cannot be used on a single assignment.

Grading Scheme: – 60% for pledged assignments and 40% for unpledged ones.
– Class participation, improving performance on the pledged assignments, and feedback on the handouts will be considered when assigning borderline grades.)

Required Reading: Handouts for the lectures are available from the course web site.

Programming: Many homework assignments will require some MATLAB and/or AMPL programming. Your solutions should adhere to good programming standards, and must not be copied from other students. Consult the course web site for pointers to MATLAB and AMPL tutorials.

References: There are many books on optimization. See a list in the course web page.

Any student with a disability requiring accommodation in this course is encouraged to contact the instructor during the first week of class, and also to contact Disability Support Services in the Ley Student Center.