Numerical Methods for Optimization Problems

CSC 2305 Course Description Winter 2014

Possible topics include: optimization along a line; steepest descent methods; Newton's method; quasi-Newton methods; conjugate gradient methods; variants of Newton's method for nonlinear least squares problems; projection methods for optimization subject to linear constraints; Lagrangian methods for optimization subject to nonlinear equality constraints; penalty function methods for optimization subject to nonlinear inequality constraints.

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Email: I'll try to answer your email within a day or so. If my reply will be long, I'll probably ask you to talk to me instead about your question. If the answer to your question will benefit many other students in the class, I will likely copy my reply to the whole class (after removing anything from it that will identify you).

I get a lot of email, so it is a good idea to start the Subject line of your email with "CSC 2305" so that I can easily distinguish it from other email.

Course Webpage: `http://www.cs.toronto.edu/~krj/courses/2305/`

Office Hours: by appointment

Lectures: Mondays Wednesday and Fridays, 12–1 PM in BA 2179.

Course Text: *Numerical Optimization*, **Second Edition**, Jorge Nocedal and Stephen J. Wright, Springer, 2006.
You can purchase it at the UofT Bookstore or at one of the online bookstores (such as Amazon or Chapters-Indigo).
Make sure you get the **second edition**.

Prerequisites: An undergraduate numerical analysis course such as CSC 350. Good knowledge of numerical linear algebra and vector calculus (e.g., eigenvectors, LU factorization and partial derivatives) and good programming skills. Previous experience with MatLab will be helpful, but not essential.

Grading: The grade for the course will be based on

1. Term Assignments: 30%
   (There will likely be an assignment every week or two.)
2. Midterm Test: 30%
3. Final Exam or Project: 40%.
   (You can choose to do a final exam or a project of your own choosing. If you would like to do a project, talk to me about it before you start to ensure that it is suitable.)

Late Policy: Completed assignments must be submitted at the **beginning** of the tutorial or lecture on the date that they are due. Late assignments will be accepted at the **beginning** of the next lecture with a penalty of 25%. Assignments will not be accepted after that time unless you have a very good reason for being late.

MatLab: See our course webpage for some MatLab primers.

Plagiarism: Please read
`http://www.cs.toronto.edu/~fpitt/documents/plagiarism.html`
`http://www.cs.toronto.edu/~clarke/acoffences/`
`http://www.artsci.utoronto.ca/osai/students`

Accessibility Services: The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact Accessibility Services as soon as possible. See `http://www.accessibility.utoronto.ca/`