CSCC50H – Numerical Algebra and Optimization  Fall 2002

Instructor: Wayne Enright, enright@cs.utoronto.ca

Tutor: Emma Bradbury, emma@cs.utoronto.ca

Lectures: Monday 12:10–1:00, Wednesday 12:10–1:00 in S319.

Tutorials:

1. Tutorial 1: Friday 9-10 in S356.
2. Tutorial 2: Friday 10-11 in H308.
3. Tutorial 3: Thursday 4-5 in H402.

Office hours:

Instructor: Mondays and Wednesdays 10:30–11:30, and 3:10–4:00 in S648.
Tutor: TBA.


Other texts for reference: check the webpage of the course for other related books.

Course goals (from the academic calendar): The efficiency and stability of solution techniques for systems of linear equations, least squares problems and eigenvalue problems including LU- and QR– based methods. Algorithms for optimization problems, including systems of nonlinear equations.

Prerequisite: MATB24H and MATB42H and (CSCB70H or CSCA57H or PSCB57H).

Course Outline (tentative):

1. Mathematical Background [2 weeks].
   Round-off errors and analysis, matrix transformations, error propagation.

2. Matrix Decompositions [4 weeks].
   L/U decomposition and Gaussian elimination, Implementation issues, Error analysis, QR decomposition, Solving Linear Systems with QR, Implementation issues and Iterative improvement.
3. Linear Least Square problems and Eigenvalue problems [3 weeks].

4. Nonlinear Equations [3 weeks].
Review of Newton’s method for scalar equations, Newton’s method for systems,

Home page for the course:

Home page for the tutorial:
TBA

Marking Scheme:

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<thead>
<tr>
<th>Assignment</th>
<th>Hand-out Date</th>
<th>Due Date</th>
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<tr>
<td>1</td>
<td>September 16</td>
<td>September 27</td>
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<td>2</td>
<td>September 30</td>
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<td>November 11</td>
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To pass the course, you must receive at least 35/100 on the final exam. See the webpage of the course for the policies on plagiarism and lateness.

Additional material will be taught in the tutorials. You are expected to know this material. Graded assignments and test will be handed back by the tutor.

Schedule:
First lecture - September 9

Midterm test - TBA
Thanksgiving Holiday - October 14
Last date to drop - November 3
Last lecture - December 2
Final exam - To be scheduled