

AMSC/CMSC 460 SECTION 0201 (Spring 2005)  
**COMPUTATIONAL METHODS**  
MTH 0101 TuTh 9:30-10:45AM

**Instructor**

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Office Hours: M 4:30-5:30, Tu 11-12 (or by appointment)

**Grader**

Ning Jiang

**Texts**

*Numerical Computing with MATLAB*, Cleve B. Moler, SIAM (2004), ISBN 0-89871-560-1 (pbk).  
*Introduction to Scientific Computing*, Second Edition, C.F. Van Loan (2000); ISBN 0-13-949157-0.

**Topics**

- §1. Introduction to MATLAB, Floating-Point Arithmetic and Errors.
- §2. Linear Equations.
- §3. Interpolation.
- §4. Zeros and Roots.
- §5. Ordinary Differential Equations
- §6. Least Squares.
- §7. Quadrature
- §8. Fourier Analysis.

**Description**

This course has a substantial computing component. The computing will be done with MATLAB, a software system for scientific and engineering computing, using the software that accompanies the text by C.B. Moler. You can access MATLAB in a WAM Lab, in a GLUE Lab, or on your PC, if you have the Student Version or the Student Edition of MATLAB. In the WAM and GLUE Labs, MATLAB is on the Sun workstations and PCs. The Student Version is available in the bookstores and on the MathWorks website [www.mathworks.com](http://www.mathworks.com). The Moler's software NCM (for Numerical Computing with Matlab) is available from

[www.mathworks.com/moler](http://www.mathworks.com/moler)

If you use a unix machine, download the file `ncm.tar.gz` in a new directory, and then type

```
gunzip ncm.tar.gz
tar vxof ncm.tar
```

This will create all the MATLAB files `*.m` of the book. If you use a PC with windows, then download the file `ncm.zip` and unzip it in a new folder.

You can buy the book in the Bookstore, directly from Amazon, or you can download chapter by chapter from the website [www.mathworks.com/moler](http://www.mathworks.com/moler). Please get the book and accompanying software right away.

This course now runs with a *portal* to research format. Towards the end of April there will be a substantial computer project, to be done in groups of 2-3 students, about ordinary differential equations and models governed by them. This project will count as a homework, but may be continued over the summer as a research experience. This is to be coordinated with the instructor, the Math Dept, and the TA Stephen Clark, who will be working on the design, testing, and grading of these projects.

**Grading Policy**

MIDTERM EXAM (20 %):  $\approx$  March 31, §§1,2,3,4.

FINAL EXAM (30 %): May 17, 8-10AM, §§1,2,3,4,5,6,7,8.

COMPUTER PROJECTS (50 %): There will be about 7 computer projects. The following penalties will be used for late homeworks: 10% off for up to 3 days late and 20 % off for up to 6 days late. Homeworks later than 1 week will not be accepted.