The courses Math 515 and Math 516 represent a year long sequence covering the major topics in scientific computation. This semester (Math 515) focuses on numerical linear algebra and matrix computations. My lectures are mainly drawn from the book:


There are several excellent books you can use as references, including:


The material we will cover this semester includes:

- Matrix decompositions, such as LU, QR, SVD, and Cholesky.

- Approaches to solve linear systems, including least squares problems. These approaches include:
  - Direct methods, based on matrix decompositions.
  - Iterative algorithms, including stationary methods such as Jacobi, Gauss-Seidel, SOR, and conjugate gradient methods such as PCG, GMRES, MINRES, and LSQR.

- Conditioning, stability and accuracy.

- Methods to compute eigenvalues and eigenvectors (as well as singular values and singular vectors) of matrices.
Course Policies

Grades:
There will be a midterm exam, a final exam, and several homework assignments. The final grade will be determined as:

50% Homework  25% Midterm Exam  25% Final Exam

Important Dates:
- October 16: Midterm exam.
- December 11: Final Exam, 3:00–5:30pm.

Homework:
Homework will be a combination of computing and analysis. All computing will be done using MATLAB. Solutions, results, and analysis should be organized, neatly written, and a pleasure to read.

Graduate Student Conduct Code:
All students must adhere to the provisions of the Graduate Student Conduct Code. For more information, see page 29 of the graduate student handbook; http://www.gs.emory.edu/uploads/LGS-Handbook_2013-14.pdf