Course Announcement

Course: CSCE/Math 447/847, Numerical Analysis II

Topic: Numerical Linear Algebra

Time: 3:30-4:45, TR, Fall Semester 2008

Place: AvH 12

Instructor: Thomas Shores

Text: *Numerical Linear Algebra* by L. Trefethen and D. Bau, SIAM.

Preq: CSCE/Math 340 and Math 314, or permission.

Description: So what is numerical linear algebra? Math 314 II? An analysis of rounding errors? Not exactly. The textbook for this course is a gem, and its preface contains one of the most elegant descriptions that I know of the subject:

"The field of numerical linear algebra is more beautiful, and more fundamental, than its rather dull name may suggest. More beautiful, because it is full of powerful ideas that are quite unlike those normally emphasized in a linear algebra course in a mathematics department. (At the end of the semester, students invariably comment that there is more to this subject than they ever imagined.) More fundamental, because, thanks to a trick of history, 'numerical' linear algebra is really applied linear algebra. It is here that one finds the essential ideas that every mathematical scientist needs to work effectively with vectors and matrices. In fact, our subject is more than just vectors and matrices, for virtually everything we do carries over to functions and operators. Numerical linear algebra is really functional analysis, but with the emphasis always on practical algorithmic ideas..."

Here is a list of topics we will cover: fundamentals (review of some linear algebra with a smattering of new ideas), QR Factorization and least squares, Gram-Schmidt orthogonalization, conditioning and stability, systems of equations, eigenvalues, singular values and iterative methods.

There will be a midterm, a final and homework assignments. Some Matlab programming will be required, but all of it can be done in the Mathematics Computer Lab and no prior experience with Matlab is required.

If anyone has questions about the course, contact Thomas Shores (tshores1@math.unl.edu).