CSE /Mathematics 550
Introduction and Syllabus

Instructor
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Class URL
http://www.cse.psu.edu/~barlow/cse550/index.html

Text
Johns Hopkins Press, 1996. (Required)

Publications, Philadelphia, 2005. (Optional) This book is an excellent guide
to MATLAB, but if you have another it is not necessary to get this.

On reserve in Earth and Mineral Sciences Library


Prerequisites
CmpSc/Math 456 or Math 441 or consent of instructor.

Course Summary
The purpose of the course is to discuss the solution of linear algebraic prob-
lems on the computer. The first two weeks will review norms, linear systems, and other information from CmpSc/Math 456.

The remainder of the course will emphasize the solution of eigenvalue problems, singular value problems, and least squares problems. Eigenvalue and singular value algorithms discussed will include the QR algorithm, divide-and-conquer algorithms, inverse iteration, and Lanczos algorithms. Least squares algorithms discussed will include Q–R factorization, rank detection, and condition estimation.

Tentative Syllabus


January 16 Martin Luther King, Jr. Day. No classes.


March 6–10. Spring Break. Have a good time.

March 13–24 The Lanczos algorithm (for eigenvalues and singular values). Chapter Nine.


April 17–28. Total Least Squares and other special topics. Notes and Section 12.3.