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Math / CSE 6643

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office hours: 4:15 - 5:15.

Grading: Assignments (4 sets) 40% 30%
Midterms (2 exams, Sept. 27, Nov. 8)
Final exam (Dec 11, 2:50pm) 30%

Books:

- Numerical Linear Algebra.
Trefethen & Bau II. SIAM.
- Matrix Computations. Golub and van Loan.
Johns Hopkins Univ.
- Iterative Methods for Solving Linear Systems.
by A. Greenbaum. SIAM
- Iterative Methods for Sparse linear Systems.
Yosef Saad. SIAM.

Tentative Course Materials.

- Introduction: Fundamentals. SVD.
- Linear systems. least squares problem.
- QR factorization, Gram-Schmidt. Householder transform, Givens rotation.
- Direct methods: GE, pivoting, LU factorization, Cholesky factorizations.

Eigenvalue and Singular Value decomposition.

- Rayleigh Quotient, Inverse Iteration.
- QR algorithm.
- Divide-and-Conquer algorithm.
- SVD.

Iterative methods.

- CG, Krylov subspace, GMRES
- Multi-grid.

Goal: Solve

$$A \tilde{x} = \tilde{b}$$

Lay

Strong