

MTH 365/465 STUDY GUIDE FOR EXAM III SPRING 2016

Exam III will be held on Friday, April 29th, 12-1 pm, in room 403. You can use a calculator and a two-sided letter size cheat-sheet. We will have a review session during our Wednesday class, on April 27th.

What you need to know for this exam:

- The conjugate gradient algorithm for SPD matrices (unconditioned/standard one, p. 339).
- The least squares (LS) problems (formulation) - §7.6.
 - Solving LS by the normal equations, §7.6.1.
 - Solving LS by QR decomposition (reduced form), §7.6.2.
 - Fitting polynomials to data, §7.6.3.
- Eigenvalues and eigenvectors §12.1:
 - definitions and computation;
 - geometric and algebraic multiplicity of an eigenvalue, defective matrices;
 - diagonalizability of a matrix, eigenvalue decomposition;
 - Gerschgorin theorem: locate eigenvalues using Gerschgorin row and column disks;
 - the power method (§12.1.1): computing the largest eigenpair.