

## **MATH 1080: Spring 2011**

### Midterm Exam II Review Topics

Chapters: III.12-16, IV.20-23

#### Theory:

- Understanding the distinction between conditioning, stability and accuracy
- Definition of absolute and relative condition numbers
- Basic axioms of floating-point arithmetic
- Definition of stable and backward stable algorithms
- Definition of accuracy
- Definition of row echelon form
- Row reduction and elementary row operations
- LU factorization and properties of triangular matrices
- Definition of partial pivoting
- Definition and properties of a positive definite symmetric matrix

#### Methods

- Computation of Jacobian of a function and the norm of the Jacobian
- Computation of absolute and relative condition numbers
- Computation of matrix condition number
- Determination of stability of a simple algorithm
- Determination of accuracy of a simple algorithm
- Computation of LU factorization with and without partial pivoting
- Verification of positive definiteness of a matrix
- Computation of Cholesky factorization of a positive-definite symmetric matrix
- Solution of a system of linear equations using LU or Cholesky factorization