

CSCC37 Fall 2024 Term Test Topics

The term test will cover topics from the following list. These are *potential* topics only; obviously not all can be covered on a 90-minute test. (Sections (1) *Course Administration* and (2) *Course Overview* are not listed below.)

3) Floating Point Arithmetic

- Representation of integers, base conversion
- Representation of reals, machine representation of reals
- Significant digits, overflow/underflow
- Chopping/rounding, relative roundoff error (RRO)
- Machine arithmetic, machine precision
- Roundoff error propagation, subtractive cancellation

4) Systems of Linear Equations

- Linear system generalized solution technique
- Matrix interpretation, Gauss transforms
- LU factorization
- Using $A = LU$ when solving $Ax = b$
- GE with row partial pivoting, permutation matrices
- Controlling roundoff error propagation
- $PA = LU$ factorization
- Using $PA = LU$ when solving $Ax = b$
- Singular systems
- Complexity of GE (factorization, forward & back solve)
- Error analysis of GE with row pivoting
- Relative residual vs. relative error
- Matrix condition, condition# formula, relative error bounds
- Geometric interpretation of condition
- Iterative refinement (iterative improvement)

5) Single NonLinear Equations

- Final exam; not on term test

6) Approximation & Interpolation

- Final exam; not on term test

7) Numerical Integration / Quadrature

- Final exam; not on term test