Math 355, Math 655, CSC 355, CSC 655
Exam 2 info

This exam will cover everything since the last exam (Sections 3.3–4.1).

The best way to prepare for this exam is to know and understand the lecture notes (make sure you can do every problem we did in class), be able to do all homework problems, and read through the pertinent sections in the text. Some questions will be similar to homework problems; some questions will ask you to apply your knowledge.

Below are lists of important topics and things you should definitely know:

Divided differences (Section 3.3):

1. definition of a divided difference
2. write down a divided difference table
3. use divided differences to obtain an interpolating polynomial
4. compute polynomials of degree d that pass through n data points, when possible.

Hermite interpolation (Section 3.4):

1. know what a Hermite polynomial does
2. compute a Hermite polynomial to interpolate data points
3. the error bound for Hermite polynomials

Splines (Section 3.5):

1. compute linear splines
2. properties of general cubic splines
3. compute natural splines, clamped splines, curvature-adjusted splines, parabolically-terminated splines, not-a-knot splines

Parametric curves (Section 3.6):

1. know what linear, quadratic, cubic Bézier curves are
2. compute a cubic Bézier curve
3. derive formulas for Bézier curves

Numerical differentiation (Section 4.1):

1. use Taylor series to derive formulas and errors associated with them
2. know and use two-point forward and backward-difference formulas and their errors
3. know and use three-point formulas and five-point formulas and their errors

Other notes:

- You may bring with you a $5'' \times 8''$ note card of **hand-written** notes (you may use both sides of the card)
- No calculators and no cell phones will be allowed
- 50 minute exam