MATH 385  NUMERICAL METHODS I  3 hrs, 3cr.

There is no required textbook. Students are provided with lecture notes (no charge) the first day of classes.

This is a basic numerical methods course. Students must have background in Linear Algebra and Multivariate Calculus. Programming is in Mathematica.

Topics:

**Basics**
1. Basics of programming in Mathematica.
2. Errors in computation
4. Solving linear systems of equations
5. Newton’s method and max/min problems for functions of several variables

**Interpolation**
1. Polynomial interpolation
2. Bezier interpolation
3. Least squares fitting
4. Cubic splines and B-splines

**Numerical Analysis**
1. Finite differences
2. Finite difference method applied to a PDE
3. Numerical integration including the trapezoid method, Simpson’s rule and Gaussian quadrature.
4. Euler forward method applied to an ODE