

Syllabus for Math 269A: Advanced Numerical Analysis

Required Textbook: Stoer and Bulirsch, *Introduction to Numerical Analysis*, Springer 1993 (2nd edition), chapter 7.

Recommended Textbooks:

- Lambert, *Numerical Methods for Ordinary Differential Systems*, Wiley 1991.
- Iserles, *A First Course in the Numerical Analysis of Differential Equations*, Cambridge University Press 1996.

Prerequisites: at least one undergraduate course on numerical analysis (equivalent to Math 151A-B)

Topics: (approximate) Introduction: notation and some theorems. Numerical approximations of ordinary differential equations. Methods: one-step, Runge-Kutta, multistep, finite difference. Study the accuracy, stability, and convergence behavior of each method. Stiff equations.