

# Numerical Analysis: Math 128a

Fall 2001, MWF 10–11 in 3 Evans

**Professor:** Michael Anshelevich, 1063 Evans, manshel@math.berkeley.edu.

**Office hours:** M 11–12, W 2–3. The office hours for my other class are Tu 11–12, F 2–3. You are welcome to come by then, but the students from the other class have priority.

**Class homepage:** <http://www.math.berkeley.edu/~manshel/m128/m128.html>. I will use it to post homework assignments and last-minute announcements. Also, if you want to be on the mailing list for the class, send me email in the first week of classes.

**GSI:** Robert Cheng, rhcheng@math.berkeley.edu. Section Tu 2–3, 3111 Etcheverry.

**Text:** Stoer and Bulirsch, *Introduction to Numerical Analysis* (2nd ed.). Recommended reading: Press et al., *Numerical Recipes: The Art of Scientific Computing* for the appropriate programming language. A Matlab primer is available on the class homepage.

**Prerequisites:** Math 53, Math 54. Some topics you should be familiar with: Taylor's theorem, differential equations, and linear algebra, in particular solution of systems of linear equations. Programming experience is definitely a plus, otherwise you will have to learn very quickly. The primary programming language in the course will be Matlab.

## Syllabus:

- General error analysis.
- Interpolation by polynomials, trigonometric functions, and splines.
- Numerical integration.
- Solution of systems of linear equations.
- Zero-finding and solution of non-linear equations.
- Initial-value problems for ordinary differential equations.

We will touch upon a number of other topics, and investigate them in more detail if time permits.

**Exams:** We will have an in-class midterm on October 12th. The final exam is on December 12th, 8-11. No make-up exams will be given.

**Homework:** There will be weekly assignments, handed out and due in section. They will contain some theory problems (mostly from the textbook), some brief computational problems, and occasionally longer problems requiring more extensive amount of programming. No late homework will be accepted; the lowest score will be dropped. You are encouraged to work together, but you must each turn in your own work. For the computational problems, you are welcome to use Matlab, but you should turn in the same amount of intermediate calculations as you would if you did them with paper and pencil.

**Grading:** Homework and programming assignments 40%, Midterm 20%, Final 40%.