List of Topics for Presentations
Numerical Analysis, Fall 2016

We will have a week of presentations starting the 5th of December. You presentation does not have to be longer than 20-25 minutes, if you need more time, let me know in advance so that we could plan accordingly.

Each graduate student must present. If you are an undergraduate student, you can also present a topic for having fun and earning bonus points.

Your presentation can be done in a classical lecture style (chalk and board) and/or using slides. Presentation should include motivation and idea of a method, implementation and short error analysis (if applicable), and, of course, example(s). You can use MATLAB to generate some results.

Choose from the suggested topics below. If you want to choose a topic which is not on this list, please discuss it with me. You can also share a topic with another student. **Please report on the chosen topic during the week November 14-18th.**

1. IVP for ODEs: material from sections 11.3-11.4 of our textbook.
2. Monte Carlo methods from Chapter 3 of our textbook.
3. Numerical methods for PDEs from Chapter 14 of our textbook (for instance, Fourier Analysis, the Fast Fourier Transform, finite difference and finite element methods).
4. Topics from Chapter 7 of our textbook (direct methods for solving linear systems, least squares).
5. Topics from Chapter 12 of our textbook (eigenvalue problems and iterative methods for solving linear systems).
6. Numerical solutions of nonlinear systems of equations from Burden's textbook Chapter 10: (for instance, Homotopy and Continuation methods (section 10.5) or Newton's method (section 10.2, it is also in section 11.5.2 of our textbook)).

   This is the link to Burden's "Numerical Analysis" (9th ed.): `http://ins.sjtu.edu.cn/people/mtang/textbook.pdf`.