SYLLABUS OF MATH 226A: COMPUTATIONAL PDES

LONG CHEN

1. CLASS AND INSTRUCTOR INFORMATION

Class.

- MATH 226A: COMPUTATIONAL PDES
- Course Code: 45095
- Quarter: Fall 2011
- Meeting Information
  11:00 am - 12:20 pm in RH 192.

Instructor.

- Long CHEN
- Email: chenlong@math.uci.edu
- Phone: (949) 824-6595
- Office Location: 510F Rowland Hall
- Homepage: http://www.math.uci.edu/~chenlong

2. CONTENT

Course Description. In Math 226 A, we shall focus on numerical solutions for the elliptic equations. Parabolic and hyperbolic equations will be discussed in 226 B and C, respectively. More precisely, we plan to cover the following topics:

- Finite element methods for linear elliptic equations
- Finite difference and finite volume methods
- Sobolev spaces and elliptic equations
- Nonlinear elliptic equations
- Fast solvers: Conjugate Gradient method and multigrid method
- Adaptive finite element methods

Reference. Lecture Notes will be distributed in class. But the following books are good references for reading:

- S. Larsson and V. Thomée, Partial Differential Equations with Numerical Methods, Springer, 2003.
- S.C. Brenner and L.R. Scott, The mathematical theory of finite element methods, vol.15 of Texts in Applied Mathematics, Springer-Verlag, New York, second edition, 2002.

Homework, Project, and Exam. Homework and MATLAB projects will be assigned on the course homework page and should be completed by the indicated due date.

Grading. Your course grade will be determined by your cumulative average at the end of the term:

- 40% Homework
- 40% Matlab projects
- 20% Final Exam/Project

Reading. As a graduate course, reading the paper corresponding to the assigned homework or project is considered part of the assignment. You are responsible for material in the assigned reading whether or not it is discussed in the lecture.