Math 226B
Numerical Analysis for PDE

John Lowengrub
MWF 12-12:50pm
RH 340P
Office hours: 11-12pm MF, 2-3pm W

Suggested Texts:

J.C. Strikwerda, Finite Difference Schemes and Partial Differential Equations, SIAM (2004).

R.J. LeVeque, Numerical Methods for Conservation Laws, Lectures in Mathematics, ETH-Zurich, Birkhauser-Verlag (1990).

Topics:

Hyperbolic Equations: Linear, Nonlinear Conservation Laws

> Finite Difference Methods (FDM), Finite Volume Methods (FVM), Finite Element Methods (FEM)

Parabolic Equations: Linear, Nonlinear

> FDM, FVM, FEM

For both types of equations we will

> Derive algorithms
> Perform stability analyses (von Neumman, Nonlinear stability analysis)
> Study convergence (Lax Equivalence Theorem)
> Discuss numerical implementation issues

Course structure:

2 Homework Assignments
2 Projects
1 Final Project

Grading:

The final grade will be determined by the cumulative average at the end of the quarter.
40% Homework

40% Projects
20% Final Project