

Numerical Solution of Partial Differential Equations

Applied and Comp Math 922

Section: G100

Term: 2011 Fall

Instructor:
Dr. Adam Oberman

Discussion Topics: Numerical solution of partial differential equations

- Finite Difference methods for time dependent PDEs
- Finite Difference methods for elliptic PDEs
- Finite Element Methods

Applications of nonlinear elliptic PDEs, numerical methods

Selected topics from:

- Level set method and Front propagation
- Hamilton-Jacobi Equations (optimal control theory, path planning, wave propagation)
- Mathematical Finance (option pricing, portfolio optimization)
- Geometric PDEs (curvature flows, surface deformations, Greens coordinates, Monge-Ampere equation)
- Mathematical Image processing

Grading: 20% Homework and Quizzes

30% Midterm Exam

50% Final Exam

Required Texts:

Recommended Texts:

recommended:

Numerical Methods for Evolutionary Differential Equations

Uri M. Ascher

(will be used for part of the course)

Remainder of course: notes will be provided by instructor

Materials/Supplies:

Prerequisite/Corequisite: recommended:

MACM 316 or MACM 416 or equivalent introductory numerical analysis course

MATH 418 or equivalent introductory PDE course

Notes: THE INSTRUCTOR RESERVES

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of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

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