

Partial Differential Equations

Applied and Comp Math 901

Section: G100

Term: 2010 Fall

Instructor: Razvan Fetecau

Discussion Topics: This course is an introduction to the analysis of partial differential equations and relevant topics in real and functional analysis.

We will cover:

- 1) Linear first order equations and the method of characteristics.
- 2) Classification of second-order linear PDEs.
- 3) Explicit representations for solutions of certain linear PDEs (the wave, heat and Laplace equations). Greens functions and distributions.
- 4) Sobolev Spaces with applications to second order elliptic PDEs
- 5) The Hamilton-Jacobi equation.
- 6) Hyperbolic conservation laws

Grading: Problem Sets: 50%

Final Exam during the last week of classes: 50%

Required Texts: Partial Differential Equations, by L.C. Evans, American Mathematical Society, 1998

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite: A thorough knowledge of advanced calculus and basic real analysis (eg. Rudin: Principles of Mathematical Analysis).

An undergraduate course in PDEs. Topics assumed to be studied previously: separation of variables, Fourier series, 1D wave equation (DAlembert solution, reflections), 1D heat equation (diffusion kernel, maximum principle), Laplaces equation (maximum principle, Greens function).

Notes: THE INSTRUCTOR RESERVES THE RIGHT TO CHANGE ANY OF THE ABOVE

INFORMATION.

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

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