

MATH 462 Section 0101 Spring 2008
Partial Differential Equations for Scientists and Engineers
Tu-Th 11-12:15, MTH B0429

Instructor

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Grader

Not known yet

Objectives

This course is an introduction to partial differential equations (PDE). We will discuss first order equations, the heat equation, the wave equation and the Poisson equation, the last three being the prototype of second order equations. We will also discuss nonlinear equations of each type. We will develop the method of separation of variables and eigenfunction expansions, which lead to Fourier analysis. Qualitative properties and numerical methods will also be studied. This corresponds to *Chapters 1 to 8* of [1] (except 7). MATLAB will be used mostly for graphical purposes and illustrative computation using [2]. You can access MATLAB in a WAM Lab, in a GLUE Lab, or on your PC, if you have the Student Version or the Student Edition of MATLAB. In the WAM and GLUE Labs, MATLAB is on the Sun workstations and PCs. The Student Version is available in the bookstores and on the MathWorks website www.mathworks.com.

Texts

[1] Walter A. Strauss, *Partial Differential Equations: An Introduction*, John Wiley and Sons: 2nd edition (2008), ISBN-13 978-0470-05456-7 or 1st edition (1992), ISBN 0-471-54868-5.

[2] Jeffery M. Cooper, *Introduction to Partial Differential Equations with MATLAB*, Birkhäuser (1998), ISBN 0-8176-3967-5.

Grading Policy

The following percentages assume there will be a grader. In such a case, the final grade will be based on homeworks (20%), quizzes (10%), two exams (20% each), and a final exam (30%). No make-up exams will be given, unless a written excuse is presented in advance and in accordance with University Policies. Computer exercises will use MATLAB. Homeworks are due before class starts. There will be a penalty of 10% for one day late, 20% for two days, and so on. Homework will not be accepted after one week.

Exam 1: §§1-3 (\approx Thursday March 13).

Exam 2: §§4-6 (\approx Tuesday April 29).

Final Exam: §§1-8 (Thursday, May 15, 8-10AM).

Prerequisites

Calculus MATH 240, 241 and Elementary ODE MATH 246 (or equivalent).