MATH 462 Section 0201 Fall 2018

PARTIAL DIFFERENTIAL EQUATIONS

Tu-Th 2-3:15, MTH 0411

Instructor

Dr. Ricardo H. NOCHETTO
Office MTH 3310, Office Hours: Mo and We: 4:30-5:30 (or by appointment)
Phone 301-405-5145, e-mail: rhn@math.umd.edu, URL: www.math.umd.edu/~rhn/

Grader

Shuo Yang, office hour Fri 11-12, MATH 1305, shuoyang@math.umd.edu

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 the Computer Labs or on your PC, if you have the Student Version or the Student Edition of MATLAB. In the Computer Labs, MATLAB is on the PCs and MACs. The Student Version is available in the Terrapin Technology Store (Stamp Union) 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*, Birkhaüser (1998), ISBN 0-8176-3967-5.

Grading Policy

The final grade will be based on **homeworks (25%), quizzes (5%), 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 will be assigned weekly and will be 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 and part of §2 ($\approx$ Thursday October 4).

Exam 2: §§2-5 ($\approx$ Thursday November 20).

Final Exam: §§1-6, §8 (Saturday, December 15, 10:30am-12:30pm).

Prerequisites

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