

MATH 4347, PARTIAL DIFFERENTIAL EQUATIONS I
COURSE SYLLABUS
FALL 2017

INSTRUCTOR: ANDRZEJ SWIECH

LECTURES: MW 3:00-4:15 PM, SKILES 257

OFFICE: SKILES 206

OFFICE HOURS: M 10:00-11:00, T 2:00-3:00 PM, F 1:30-2:30 PM

PHONE: (404) 894-2705

E-MAIL: swiech@math.gatech.edu

COURSE WEB PAGE: <http://www.math.gatech.edu/~swiech/4347f17.html>

TEXTBOOK: E. C. Zachmanoglou and D. W. Thoe, *Introduction to Partial Differential Equations with Applications*.

MATERIAL TO BE COVERED AND COURSE OBJECTIVES: The course introduces the students to the basic theory of first and second order partial differential equations. Its main objective is to develop the students' skills in solving certain partial differential equations and build their knowledge and intuition about the nature of solutions. The main themes of the course are the following:

- (1) First order equations: the method of characteristics, conservation laws, the concept of weak solutions and solutions with shocks.
- (2) Introduction to the general theory of second order equations.
- (3) Wave equation and hyperbolic equations in dimensions one, two, and three.
- (4) Laplace's equation and the heat equation.
- (5) Systems of first order equations.
- (6) Methods of exact solutions: separation of variables, series solutions.

As the course progresses you should work on problems from the textbook. They will not be collected. A separate homework assignment will be given. The textbook contains enough problems so that you can determine what part of the material you have mastered and what you still need to work on.

GRADING: There will be three 50 minute tests (September 20, October 23, and November 15), one homework assignment (due on November 20), and the final exam. Each test will count for 15% of the final grade, the homework assignment for 20%, and the final exam for 35%. Your grade will be based on how well you can solve problems and compute using the theory. You will not be asked to reproduce proofs. To get an A, respectively B, C, and D, your final score will have to be greater than 85%, respectively 70%, 55%, and 40%.

Please be aware of the Georgia Tech Honor Code and follow it carefully. In particular please make sure that all the work you submit is your own. The Georgia Tech Honor Code can be found at <http://www.policylibrary.gatech.edu/student-affairs/code-conduct>.