Math 351, Partial Differential Equations
Spring, 2010
(Revised January 19, 2010)

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and by appointment

Course Material

This course is about partial differential equations (PDEs). I hope to cover the following material:

• Introduction (classifying a differential equation and solutions, review of ODEs).
• Three important examples: Heat Equation, Wave Equation, Laplace Equation.
• Separation of variables.
• Eigenvalues and eigenfunctions.
• Fourier series.
• Method of characteristics.
• Green’s function.

We will also use the scientific computing environment MATLAB to study the behavior of analytical solutions, as well as to compute approximate solutions of problems where analytical solutions are difficult to construct

I will be taking material from several sources, and so there is no particular assigned text. Homework and test questions will be based on material presented in class, so attending lectures is extremely important. Some useful references include:

• Any calculus book.
• Any book on ordinary differential equations, such as is used in Math 212.
• PDE books, such as:


or

   \textit{A First Course in Partial Differential Equations}, by H. F. Weinberger

• There is a lot of online tutorial material for MATLAB, including the book:

   \textit{Numerical Computing with MATLAB}, by C. Moler

which you can get (for free) from:

   www.mathworks.com/moler/chapters.html

I will also be providing some material and guidance with using MATLAB.
Course Policies

Grades. There will be 3 tests, a final exam, and assorted homework.

The final grade will be determined as:

60% Tests  20% Final Exam  20% Homework

Homework.

I will provide you with a lot of practice problem for all material we cover in class. These practice problems will be found on my website for this course:

www.mathcs.emory.edu/~nagy/courses/spring10/351.html

You will be required to turn in a subset of these problems, which I will grade, but I highly recommend you do all of the problems for practice.

Tests.

There will be 3 tests on the following dates:

   Tues., Feb. 9,    Thurs., Mar. 4,    Tues., Apr. 6

Final Exam. The Final Exam is cumulative, and will be given on Tuesday, May 4, 8:30–11:00 am.

Calculators. You will not be allowed to use calculators on any quiz or exam.

Make-up Tests and Homework.

Make-up tests will be given only in extreme cases.

The penalty for turning in late homework will be as follows:

- Homework turned in late, but before 7:00 am the following day, will receive a 20% deduction.
- Homework turned in after 7:00 am the following day, but before 4:00 pm the following day, will receive a 50% deduction.
- Homework turned in after 4:00 pm on the day following the due date will not be accepted.

Exceptions to this policy will be granted only in extreme situations.

Class Attendance. Attendance is not required, but strongly encouraged.

If you miss a class, then you should get a copy of the notes from one of your classmates. If you come to class, then I expect you will stay until the end, and not leave in the middle of a lecture. If it is necessary to leave early, then I expect an explanation. Breaks should not be needed to go to the bathroom, or to answer your cell phone. If such a break is needed, I expect an explanation.

Honor Code. All students must adhere to the provisions of the Honor Code.

For more information, see: www.college.emory.edu/current/standards/honor_code.html