MA 533, Partial Differential Equations, Fall 2017

The primary purpose of this course is to introduce some of basic methods in the theory of partial differential equations.

Time and Place: 11:00 - 11:50 am, MWF, CB 335

Instructor: Dr. Zhongwei Shen, POT 737, Phone 257-3470, E-mail: zshen2@uky.edu

Text: *Partial Differential Equations* by Lawrence C. Evans

Course Content:

1. Laplace's Equation: mean-values formulas, maximum principle, fundamental solution, Dirichlet and Neumann problems, Green's function, properties of harmonic functions, energy methods, elliptic equations.

2. Heat Equation: fundamental solutions, mean-values formula, maximum principle, energy methods, initial boundary value problems, separation of variables, parabolic equations.

3. Wave Equations: solutions by spherical means, nonhomogeneous problems, hyperbolic equations.

4. Nonlinear PDEs; Fourier transform; homogenization, weak solutions; Navier-Stokes equations.

Exams: There will be an in-class midterm exam on Friday, October 13. The final exam (Tuesday, 10:30 am - 12:30 pm, Dec. 12) will be comprehensive.

Grading System: Midterm: 100 points

                           Homework: 250 points

                           Final Exam: 150 points

                           Total: **500 points**

The course grading scale is the usual 100-90%, 89-80%, 79-70%, ... for A, B, C, ... , etc.

Office Hours: I will be in my office (POT 737) at these times specifically to help you:

                        Monday, Wednesday, and Friday: 2:30 – 4:00 pm.

You may also see me by an appointment.

Homework: Homework will be assigned weekly and due on the day designated. All problems will be graded. Late homework will not be accepted without a valid excuse. It should be emphasized that students are expected to spend a substantial amount of time outside of the class both on homework and on understanding their class notes.

Working together on the homework is allowed, but should be acknowledged. Internet as well as solutions handed out in previous years for this course should NOT be consulted while working on homework problems. Attendance is required for this course.