

MA 533, Partial Differential Equations, Fall 2013

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

Time and Place: 11:00am–11:50am, MWF, CB 347.

Instructor: Changyou Wang, Professor of Mathematics, POT 771, Phone 257-4734, E-mail: cywang@ms.uky.edu.

Textbook: **Partial Differential Equations** by Lawrence C. Evans, Graduate Studies in Mathematics, Volume 19, American Mathematical Society.

Course Contents: It covers from the Chapter 2 to the Chapter 4 of Part I of the book, but with emphasis on the first three topics in the Chapter 2:

- 1 Laplace's Equation: Mean-value formulas, maximum principle, fundamental solution, Dirichlet problem, Green's function, Harnack inequalities, and energy methods.
- 2 Heat Equation: Fundamental solution, mean-value formula, maximum principle, energy method, initial boundary value problems, and the separation of variables.
- 3 Wave Equation: Solutions by spherical means, nonhomogeneous problem, and the energy methods.
- 4 Nonlinear First-order PDEs: Characteristic method, Lewy's example, the Cauchy problem, and the Cauchy-Kowalevski theorem.

Tests:

There will be an one hour in class midterm exam to be hold at **Friday, October 18** and an two hour final Exam to be hold at **Wednesday, December 18, 10:30 am-12:30 pm** in this classroom. The final exam will be comprehensive.

Grading:

$$\left\{ \begin{array}{ll} \text{Midterm} & 30\% \\ \text{Homework} & 30\% \\ \text{Final Exam} & 40\% \end{array} \right.$$

As usual, the course grading scale is 90-100%, 80-89%, 70-79%, 60-69%, and 0-59% for **A**, **B**, **C**, **D**, and **E** respectively.

Make-up Tests: Students should contact the instructor to arrange a make-up test if they have a valid excuse. Students who know in advance they will be absent for a test should contact the instructor at least a week before the test date.

Office Hours: MWF: 10:00 am–10:50 am. You may also see me by making an appointment for a different time.

Homework: Homework will be assigned every Friday and due to the next Friday. Late homework will not be accepted without a valid excuse. Please staple your papers together, write clearly in sentences. Homework should be conducted independently. 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.

Attendance: Regular attendance is expected. Excessive absence will result in your being dropped from the course with a grade of E or W which ever is most appropriate.

Cheating: All university rules relating to cheating will be enforced.