MA 633, Partial Differential Equations, Spring 2014

The course is a continuation of MA 533 and can be viewed as the part II of the Partial Differential Equation course. The aim is to study the Sobolve space theory and its applications to second order elliptic PDE.

Time and Place:

9:00 am–9:50 am, MWF, CB343.

Instructor:

Changyou Wang: Professor of Mathematics

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Textbook:

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

Course Contents:

It covers Chapter 5, Chapter 6, and Chapter 7.1 (if time is permitted) of Part II of the book:

1. Sobolev spaces Definition of Hölder and Sobolve spaces, approximation properties, extensions, traces, Poincare and Sobolve inequalities, compactness, etc.

2. Second order elliptic PDE Ellipticity, weak solutions, Lax-Milgram scheme, regularity, weak version of maximum principles, etc.

3. Linear evolution equations Defintions and existences of weak solutions, regularity, and maximum principles.

Tests:

There will be a 1 hour inclass midterm exam hold at Friday, **March 14** and a two hour Final Exam hold at **05/07/2014: 8 am −10 am** in this course. The final exam will be comprehensive.

Grading System:

$$\begin{cases} \text{Midterm} & 30\% \\ \text{Homework} & 40\% \\ \text{Final Exam} & 30\% \end{cases}$$

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

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:

I will be in my office at these times specifically to help you:

Monday, Wednesday: 1-2 pm.

You may also see me by an appointment.

Homework:

Homework will be assigned weekly. Late homework will not be accepted without a valid excuse.

Please staple your papers together, write clearly in sentences. Homework should be done 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.