

MATH 581: Partial Differential Equations (II)

Winter Semester 2010

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PREREQUISITE

The main prerequisite is MATH 580, the first semester of the PDE sequence. Students will also need to be familiar with some graduate analysis.

CATALOG DESCRIPTION

This is the second semester course of partial differential equations for graduates. It focuses on theory of linear partial differential equations. The topics include Sobolev spaces, elliptic equations (including boundary value problems and spectral theory), linear second-order parabolic equations, linear second-order hyperbolic equations, hyperbolic system of first-order equations, and some important methodologies for treating PDEs, for example, the energy method, Galerkin method, and semigroup theory.

TEXTBOOK

Although there is no textbook for this course, the following reference books are useful.

- 1. C. Evans, *Partial Differential Equations*, Graduate Studies in Mathematics vol. 19 (1998), American Mathematical Society.
- 2. F. John, *Partial Differential Equations*, 4th edition, Springer-Verlag, New York, Heidelberg, Berlin, 1982.
- 3. D. Gilbarg and N. S. Trudinger, *Elliptic Partial Differential Equations of Second Order*, Springer- Verlag, New York, Heidelberg, Berlin, 1998.

HOMEWORK ASSIGNMENTS

A homework assignment will be made both in class and on the course web site each Friday, and will be due the following Friday. Later homework assignments will not be accepted.

EXAMS

There will be two exams, a midterm and a final. The midterm test will be one and half hours long, and the final exam will be three hours.

GRADES

50% for homework assignments, 20% for the midterm test, 30% for the final exam

ACADEMIC INTEGRITY

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the code of student conduct and disciplinary procedures (see www.mcgill.ca/integrity for more information).

LANGUAGE

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

EXTRAORDINARY CIRCUMASTENCES

In the event of extraordinary circumstances beyond the University's control (for example a very serious flu pandemic), the content and/or evaluation scheme in this course is subject to change.