MATH 5588: COURSE SYLLABUS
Spring 2016
Tuesday, Thursday 4:45–6:00 pm, VinH 207

Instructor: M. Carme Calderer
Office: VinH507
email: calde014@math.umn.edu
http: www.math.umn.edu/mcc (for syllabus and assignments).
Office Hours: Wednesday, 4:45–6:15 pm, Thursday, 1:30-2:30 pm, Friday, 2:45-4:00 pm and by appointment.


Other references:

These texts will be used as a source of examples and additional topics, and to learn how to apply Matlab to solving partial differential equations.

Course Prerequisites: Math 5587.

Course description: This course provides a continuation on introductory methods and techniques to solve partial differential equations. The core topics of Math 5587 included Fourier series and separation of variables to solve the heat, wave and Laplace’s equations. In Math 5588, we will explore the variational structure of elliptic problems and the ensuing theory of finite elements for their numerical solution. We will study properties of differential operators associated with linear partial differential equations, such as the structure of the eigenvalues and the solvability of boundary value problems. An important component of the course is the study of linear and nonlinear evolution equations, exploring their symmetry properties as solution tools, and analysing physical models characterized by diffusion and dispersion properties.

Sections: We will cover most of the sections of the following chapters (P.Olver’s textbook):
Chapter 5 (sections 5.1, 5.2, 5.5), 8 (sections 8.1, 8.2, 8.3, 8.4) 9 and 10. We will also cover some topics of chapter 7.

Assignments and examinations: There will be a bi–weekly homework assignment, two midterm and the final examinations.

The grade of the course will be based upon a weighted average of homework assignments and examinations:

Homework: 15 percent of the final grade.
Midterm I (Thursday, March 3): 25 percent of the final grade.
Midterm II (Thursday, April 11): 25 percent of the final grade.
Final exam (To be scheduled during the final exam week, Monday, May 9-13, at the regular class time ): 35 percent of the final grade. The final exam will be comprehensive.
The midterm will take place during class time at the usual meeting room. Please, look at the University of Minnesota schedule for the location of the final examination. Class notes will be allowed during the midterm and final examinations. Cell phones and laptops are not allowed during examinations.