MATHEMATICS 647-PDE, Spring 2016
MWF 10:00-10:50 in 301 Snow

Instructor: Dr. Milena Stanislavova **Office:** 525 Snow Hall
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Office Hours: Monday 11:00-noon, Wednesday 11:00am-noon, Friday 1-2pm
Web: http://www.math.ku.edu/∼stanis
Text: Introduction to Partial Differential Equations by Peter J. Olver
Description: This is a first course in partial differential equations for students in mathematics, physics and engineering with emphasis on applications. The purpose of this class is to introduce students to the origins, theory, and applications of partial differential equations (PDE). Several basic physical phenomena are considered, including vibrations and diffusion, and are used to derive the relevant mathematical equations. The fundamentals of the mathematical theory of PDE are motivated and developed for the students through the systematic exploration of these classical systems and their corresponding equations: the transport, wave, heat, and Laplace equations.
In addition to treating the physical origins of various PDE, this course focuses on solving evolution equations as initial value problems posed on unbounded domains (the Cauchy problem), and also on solving PDE on bounded domains (boundary value problems). While many explicit solution methods for such problems exist (we will survey many of them throughout the course), such methods often either produce solutions from which little usable information can be extracted or the solution method requires very special geometric requirements on the spatial domains (or both!). As such, it is often just as important and useful in the analysis of PDE to understand the qualitative properties of solutions in the absence of explicit solutions.
In addition to finding explicit solution techniques, we will also attempt to analyze the general behavior of solutions of a PDE without actually solving them. Such qualitative analysis is of fundamental importance in practice where explicit solution formulas for a given PDE either describe only trivial states or else dont exist. In particular, we will learn about the underlying structure of various PDE and ways that one can exploit this structure to provide useful and practical information.
Classes: You are expected to attend every class and to bring your textbook. You should read the covered sections in the book and attempt to solve some of the problems in preparation for each class. If you miss a class it is your responsibility to make up missed material on your own time.
Homework: Homework (both the reading and the exercises) should be completed by the next class after it is assigned. Homework will be collected on Fridays and each homework will be worth 20 points. Homework is a major part of the learning process in mathematics and it is essential that you work on the problems regularly. It is your responsibility to check the course website for homework and handouts regularly and to seek help on all problems that you cannot do. Help is available during office hours or by appointment with me.
You must legibly write your name and class (Math 647) at the top right portion of any graded homework you turn in. Graded homework must also be stapled and folded in half (lengthwise) to be accepted.
No late homework will be accepted.

Exams: If you have a valid reason for missing the exam, you should discuss it with me BEFORE the exam. There will be NO MAKEUP EXAMS or HOMEWORK!
There will be one **Midterm** held during regular class time on **March 9th**.
The **Final exam** is scheduled for **Friday, May 13th from 7:30am to 10am**.
Grades: Your grade for this course will be determined by the number of points that you accumulate. The points are distributed in the following way:

Homework	200 total pts	20 %
Midterm	400 total pts	40 %
Final Exam	400 total pts	40 %

The highest possible total is 1000.
A total of 900 points will guarantee an A, 800 a B, 700 a C, and 600 a D.
Students with dissabilities: The staff of Academic Achievement & Access Center (AAAC), 22 Strong, 785-864-4064, coordinates accommodations and services for KU courses. If you have a disability for which you may request accommodations in KU classes and have not contacted them, please do so as soon as possible. Please also see me in regard to accommodations necessary in this course.
Policy on religious observances: Any student in this course who plans to observe a religious holiday which conflicts in any way with the course schedule or requirements should contact the instructor as soon as possible to discuss alternative accommodations.