This is a first course on partial differential equations (PDEs), and covers the following topics.

- Fourier Series
- Sturm-Liouville Problems
- The Heat Equation, Wave Equation, and Laplace Equations
- Separation of Variables
- Eigenfunction Expansions
- Fourier Transforms
- Laplace Transforms
- Methods of characteristics
- Numerical methods

PDEs are essentially the multi-variable extension of ordinary differential equations (ODEs), which you learned in Math 2341 or Math 2351. If you have a good background in ODEs and Multivariable Calculus (Math 2321), you will find the concepts and methods in Math 4545 to be rather straightforward, though the problem solving process can be tedious. That said, as with all math courses, considerable attention and substantial practice are required for understanding and mastery.

The textbook is succinct and reasonably easy to follow. You may get the 2nd or 3rd edition (get it soon). In addition, I have posted a set of Class Notes (on Blackboard, “Course Material”), meant to be a guide and supplement to the textbook. A tentative course schedule is posted, with topics and readings from the textbook and Class Notes. You are strongly encouraged to do the reading before coming to class.

In class, I plan to lecture for about 40 minutes. The rest of the time you will work on some in-class exercises (open book and collaborative). These exercises are taken from the Class Notes. Often they are examples in the textbook but you need to fill in the details.

Every week, a homework assignment is posted on Blackboard by Friday and is due the following Thursday. You are encouraged to collaborate on homework, in person or on Blackboard Discussions, but have to write out your own solutions. Simply copying someone else’s work is NOT acceptable.

Four one-hour tests will be given in class on four Thursdays (see Course Schedule). There is no homework due on those days. Your grade is determined by in-class exercises (20%), homework (20%), and tests (60%). We have NO final exam! The bulk of the course will be done by Thanksgiving (see Course Schedule), so the key is to put in the work early on.

In additional, I would like to remind you that academic dishonesty of any type will not be tolerated (refer to your student handbook). If there are concerns about the course or instructor that cannot be resolved with the instructor, you may contact Prof. David Massey (Math Dept Teaching Director), d.massey@neu.edu. Finally, the University asks every student to complete the online TRACE survey evaluation of their courses at the end of the semester (you will receive reminders from the University).

Welcome to Math 4545!