

# **HONORS SECTION OF UNDERGRAD ODE MATH 1275- SPRING, 2012**

This is the ideal differential equations course for students who have taken the honors analysis, math 0450, or received an A in math 0420. Linear algebra, either math 1180 or 1185, is also a prerequisite. This course satisfies the ode requirement for all math majors.

In math 1275 (renumbered this year to clarify its Honors College status), you will see how the linear algebra and analysis you have studied are used to understand differential equations, an important area of both pure and applied mathematics. Topics covered previously included the proof of the existence and uniqueness theorem, an extended discussion of phase planes (which includes the important topics of dynamical systems and “chaos”), and an introduction to what are often called “special functions”, such as Bessel functions and Legendre polynomials. These topics have many applications to physics and other areas.

The course covers more material than math 1270 by reducing the time spent drilling on standard solution methods. These methods are discussed, but more efficiently and with less time spent on repetitious examples and homework than in 1270.

One feature of this honors section is a project, usually done with a partner, on a topic of your choice. Projects in past years included modeling traffic flow, a “double pendulum”, how to run a race in the shortest time, optimal control in economics, a model of hyperinflation, and methods of computing solutions numerically. You will have a choice of more applied topics or some involving rigorous mathematical proofs, or your team can come up with an idea of your own.

Here are some comments from the teaching evaluation forms of students from this course:

“teaches a lot more interesting and challenging stuff to students than a usual course”

“Pendulum examples were interesting .. Integration of software like PPlane was helpful and cool”

“The material was very interesting, and the more geometric focus seemed a lot more practical than learning recipes for finding solutions, though we did some of this too ... I liked having a final project ... an excellent opportunity to learn about something cool outside of class.”

MWF 10-10:50; 627 Thackeray Hall, #24814 (listed under Math and UHC)  
For more information, email Professor Hastings, [sph@pitt.edu](mailto:sph@pitt.edu)