MATH 2920 *Ordinary Differential Equations I* - Fall 2012 (2131)

CLASS MEETINGS: TuTh, 4:00-5:15 PM, Thackeray 524

INSTRUCTORS: Dr. Bard Ermentrout and Dr. Jonathan Rubin;

 offices: Thackeray Hall rooms 502 (Ermentrout) and 501 (Rubin);

 **phone**: 412-624-8324 (Ermentrout) and 412-624-6157 (Rubin);

 e-mail: bard@math.pitt.edu, jonrubin@pitt.edu;

 office hours: by appointment - arrange in class or by email;

 web: http://www.math.pitt.edu/∼bard/bardware/classes/2920/syllabus12.html and
  http://www.math.pitt.edu/∼rubin/classes/MATH2920/ma2920.html will contain an agenda
  for the course, homework due dates, and any handouts and important announcements given
  in class

TEXT: We will follow the lecture notes *Ordinary Differential Equations and Dynamical Systems* by Gerald Teschl (the June 27, 2012 version), and the lecture notes *Theory of Ordinary Differential Equations* by Christopher P. Grant (the July 4, 2007 version). These are freely available online (Gerald Tesch is at U. Vienna in Austria, Christopher Grant is at BYU) and are also posted on the website for this course. We have placed a few classical and more recent texts on reserve at the Engineering Library in Benedum Hall and will inform you about updates to this list:

1. *Theory of ordinary differential equations* by Earl A. Coddington and Norman Levinson (1955)

2. *Ordinary differential equations* by Jack K. Hale (1969)

3. *Nonlinear differential equations and dynamical systems* by Ferdinand Verhulst (1996)

4. *Differential equations and dynamical systems* by Lawrence Perko (2001, 3rd edition)
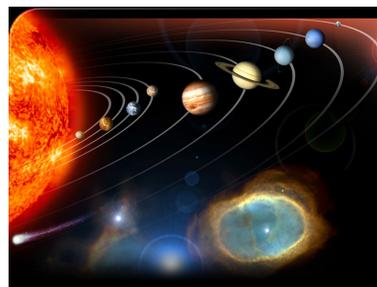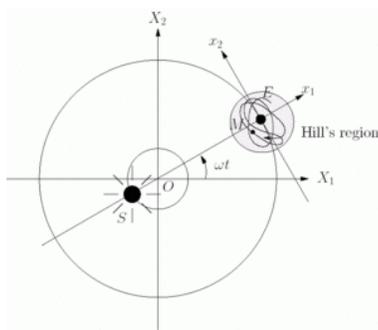

COURSE MATERIAL: This course will introduce the study of ordinary differential equations (ODE) at a graduate level. ODE is an old field, considered by Bernoulli, Euler, Laplace, and many other early mathematicians. Much of what is covered in Math 2920 is classical (but still useful!)

material, such as existence and uniqueness results, the study of linear systems, and the study of oscillations (Chapters 1,2,3,5 of the Teschl notes, Chapters 1,2 of the Grant notes). Later in the semester, we will move on to a more modern perspective (Chapters 6-9 of the Teschl notes, Chapters 3 and 5 of the Grant notes), which is continued in Math 2921 (ODE II). We will try to combine mathematical rigor with coverage of practical issues and examples.

LOGISTICS AND ASSESSMENT: Grades in this class will be based on homework assignments. We aim to cover roughly one chapter of the notes every two weeks and to give about six homework assignments. There may be a longer assignment at the end of the semester, depending on how the semester progresses. You are welcome to discuss homework problems together, but in the end each student should be sure to understand and independently write up any solutions submitted. We encourage you to come talk to us about homework problems, or any other questions you may have. **Please remember that your questions are always welcome**.
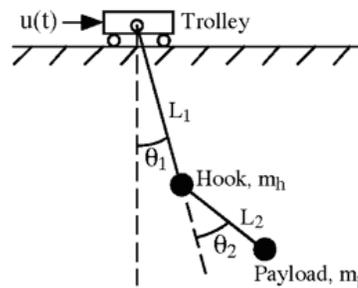
DISABILITY: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services (DRS), 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the semester. DRS will verify your disability and determine reasonable accommodations for this course.

"Anyone who cannot cope with mathematics is not fully human. At best he is a tolerable subhuman who has learned to wear shoes, bathe, and not make messes in the house." Robert Heinlein, *Time Enough for Love*