Ordinary Differential Equations (MATH 330) Fall 2016

Time: T/TH 10:05am-11:20am  Place: Farrell Hall Decision Theatre

Info: Professor Chris Danforth
Office: Room 218 Farrell Hall, Trinity Campus
email: chris.danforth@uvm.edu
twitter: @chrisdanforth
course tweets: @dallthethingsdt please use #math330 also
course website: http://www.uvm.edu/~cdanfort/main/330.html

Office Hours: Usually Wednesday morning, see Twitter.

Prerequisites: MATH 230 (Ordinary Differential Equations) or instructor permission. See me if you have not taken the prerequisites. Programming experience will prove helpful, but it is not required.


Topics:
- Chp 2: Flows on the Line (∼ 3 lessons)
- Chp 3: Bifurcations (∼ 4 lessons)
- Chp 4: Flows on the Circle (∼ 3 lessons)
- Chp 5: Linear Systems (∼ 3 lessons)
- Chp 6: Phase plane (∼ 3 lessons)
- Chp 7: Limit Cycles (∼ 4 lessons)
- Chp 8: Bifurcations revisited (∼ 3 lessons)
- Chp 9: Lorenz Equations (∼ 2 lessons)

Grades: There will be twelve homework assignments, due every week on Thursdays as you enter class. These HWs will total 40% of your grade. You will also have two in-class midterm exams worth 40%, and a final project worth 20%. In borderline situations, class participation will play a role in determining your course grade. Late homework will be marked off by 1 point for every calendar day past due.

Projects: During the final exam period, each student will give a 20 minute presentation on a seminal paper from a scientific discipline (e.g. physics, astronomy, biology, ecology, sociology) whose conclusions rely on analysis techniques from the course. Some of the main figures from the paper (e.g. trajectories of differential equations or bifurcation diagrams) should be reproduced by the student and integrated into the presentation. Topics should be related to the area of interest of the student.

Projects will be graded out of 20 points as follows: 5 points for quality of presentation media (e.g. slides are clean & interesting), 5 points for clarity of your presentation delivery (e.g. are you clear & engaging), 5 points for reproduction of paper figures (attempts count), 5 points for connection to course material, do you use concepts we talked about in class during the semester? See me for potential topics.
Remarks:

- You are required to submit your HW solutions using a mathematical document preparation software (e.g. \LaTeX). Information about \LaTeX can be found on the course website.

- Some of the homework assignments will have a component which requires the aid of a computer simulation. You are encouraged to use Matlab for these problems, but are welcome to use another language if you prefer (e.g. Mathematica). To get started learning matlab, click on the ‘how do I use matlab’ link on the course website, it points to a comprehensive set of instructional demonstration videos.

- Please bring your questions about the course material to office hours (make sure the question is important and can not be answered by a google search if you are going to send an email about it).

- Each student is required to visit my office hours at least once during the semester.

- You are encouraged to work in groups on homework assignments. However, each student must turn in their own solutions and code.

- Whenever possible, will be using Twitter to communicate about the class. I strongly recommend that you obtain a twitter account if you do not have one. Alternatively, you can observe a subset of the conversation by visiting the course webpage.

- If you need to communicate with me privately, or don’t want your question shared, please email me and include Math 330 in the subject line.

- Please silence and ignore your cellphone during class, unless you’re professing your love for the material on Twitter (see above).

- Offenses against academic integrity are any acts which would have the effect of unfairly promoting or enhancing one’s academic standing within the entire community of learners. Such acts are serious offenses, which insult the integrity of the entire academic community of the University. Any suspected violations of the policy will not be tolerated and all allegations will be forwarded to the Center for Student Ethics & Standards.

- In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. ACCESS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated in an accommodation letter to faculty. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. Contact ACCESS: A170 Living/Learning Center; 802-656-7753; access@uvm.edu; or www.uvm.edu/access.

- UVM Religious Holidays Policy: Please submit in writing by the end of the second full week of classes your documented religious holiday schedule for the semester. Students who miss work for the purpose of religious observance will be permitted make up this work.