Math 404: Intermediate differential equations

a.k.a. Introduction to dynamical systems

Winter 2015

Class
Tuesday & Thursday, 8:30 – 10:00 AM
East Hall 1084

Instructor
David Goluskin
East Hall 1864
goluskin@umich.edu
Office hours:
   Tuesday, Wednesday, Thursday at 10:00 – 11:00 AM
   By appointment

Course webpage: http://www-personal.umich.edu/~goluskin/404


Audience: Upper-division undergraduate and beginning graduate students from mathematics, the quantitative sciences, and engineering.

Prerequisites: Math 216, 256, 286, or 316
   Basic differential equations (e.g. first order equations, linear systems of equations)
   Basic linear algebra (e.g. eigenvalues, eigenvectors)
   Programming language (e.g. MATLAB or Mathematica or Python or Fortran)

Course content The course will be an introduction to the qualitative study of nonlinear dynamical systems. The focus is on low-dimensional ordinary differential equations. We will cover most of Parts I and II of the text, and some of Part III. We will use many examples from engineering and the sciences.

Grading

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<td>Homework</td>
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<td>Midterm exam</td>
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<td>Final exam</td>
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Exams

Midterm exam  Monday, February 23  6:00 PM – 8:00 PM
Final exam     Friday, April 24   10:30 AM – 12:30 PM

Locations TBA. See me immediately if you have a scheduling conflict.

Homework

- Homework will be due weekly, usually on Tuesdays at 5 PM. You may hand it in at class or slide it under my office door.
- Homework is graded by a grader. If there are errors, talk to me.
- Late homework is not accepted. If you have a legitimate excuse, such as a medical emergency, talk to me.
- Homework will be the primary mode of learning in this class. Some assignments may take a long time. Some exercises will require computer programming.
- I will generally put assignments on the course webpage, but the official version is what I assign in class. If you miss a class, talk to your classmates.
- Collaboration is encouraged. Checking answers is encouraged. Get to know your classmates.
- Copying solutions from classmates or the internet is a violation of university’s standards of academic integrity.
- Getting help from me at office hours is encouraged. The office hour schedule requires that you start assignments early. Office hours on Monday may be possible by appointment.

Conduct

- No cell phones.
- Laptops are not encouraged. If you must use one, sit in the back row.
- Questions are strongly encouraged.