

Ordinary Differential Equations (MA 2326)

Instructor: Dr. Petronela Radu

Fulbright Fellow at Trinity College Dublin (Spring 2013)

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Schedule of classes:

- Wednesday 10:00-11:00 in Physics Large Lecture Theatre (Schrödinger)
- Friday 9:00-10:00 and 12:00-1:00 both in Salmon.

Homework: There will be five homework assignments, roughly one every other week. Homework assignments, solutions will be posted at:

<http://www.math.unl.edu/~pradu3>

Topics covered: (not necessarily in the order listed)

- Terminology (order, scalar vs. system, linear vs. nonlinear, invariant)
- Separable equations, first-order linear equations, Gronwall inequality
- Existence and uniqueness of solutions, blow up in finite time
- First-order linear systems, exponential of a matrix
- Reduction of order, undetermined coefficients, variation of parameters
- Autonomous systems, phase portraits, stability, Lyapunov functions

Some brief notes for the course are posted at

<http://www.maths.tcd.ie/~pete/ode>

Textbook: We will not follow any particular textbook. Two typical references for ODEs are:

- The qualitative theory of ODEs, an introduction by Brauer and Nohel;
- An introduction to ODEs by James C. Robinson.

The former is both closer to our point of view and also more affordable.

Marking policy: 20% homework and 80% final exam.