Ordinary Differential Equations
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Lectures Thursday 3-4 in Maxwell, Friday 9-10 in Salmon and also 12-1 in Synge.

Homework There will be five homework assignments, roughly one every other week.

Topics We will cover the following topics, yet 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

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.

Marks The marking policy for the course is: 20% homework and 80% final exam.

Web page Homework assignments, solutions and some brief notes will be posted at

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