

Scientific Computing for DPhil Students II

Hilary Term 2020

Prof. Trefethen

Numerical Analysis Group, Mathematical Institute

This Course

This is the second part of a two-term MATLAB-based course offered for PRS and DPhil students across the MPLS division. The first part of the course dealt with linear algebra and optimization.

Course Outline

- (1) ODEs and nonlinear dynamics
- (2) Time-dependent PDEs and finite differences
- (3) Spectral methods and applications

Instructor

Nick Trefethen, Andrew Wiles Bldg. S2.27, 615317, trefethen@maths.ox.ac.uk. I am in the office most days; it's probably best to make an appointment by email.

Lectures

There will be 12 lectures 10:00–11:00 in Lecture Room 3 of the Andrew Wiles Bldg., Tuesdays of Weeks 1–7 and Thursdays of Weeks 1–2 and 4–6. The lectures will include frequent online examples and demonstrations, as well as nuggets of MATLAB and Chebfun. Please do not miss any lectures, as we move fast.

Reading Materials

Lecture notes (terse) will be posted on the Web. In addition, numerous handouts will be distributed and references to books, research literature, and online materials will be given.

Software Tools

See people.maths.ox.ac.uk/trefethen/tools.html.

Homework Assignments and Course Marks

Following the pattern of last term, there will be four homework assignments, due at 10:00 on Tuesdays of Weeks 2, 4, 6 and 8. We recommend producing these with MATLAB “Publish”. These will be marked and returned quickly. At the end of the term, a mark in the range α – δ will be reported to each student and to his/her supervisor.

Course Web Page

courses.maths.ox.ac.uk/node/45433. Along with lecture notes and assignments, all the MATLAB programs demonstrated in lectures will be deposited here.