Scientific Computing for DPhil Students I

Michaelmas Term 2019
Prof. Trefethen
Numerical Analysis Group, Mathematical Institute

This Course
This is the first part of a two-term MATLAB-based course offered for PRS and DPhil students across the Mathematical Physical and Life Sciences Division. The second part will deal with ordinary and partial differential equations.

Course Outline
(1) Sparse matrices and iterative methods
(2) Dense linear algebra
(3) Nonlinear equations and optimization

Instructor
Nick Trefethen, Andrew Wiles Bldg. S2.27, 615317, `trefethen@maths.ox.ac.uk`. I am in the office most days; feel free to make an appointment by email. My PA is Helen McGregor (Andrew Wiles Bldg. RI.0.26, 615316, `helen.mcgregor@maths.ox.ac.uk`).

Lectures
There will be 12 lectures in Lecture Room 3 of the Andrew Wiles Bldg., Tuesdays and Thursdays 10:00–11:00 from Week 1 (Tues. Oct. 15) through Week 6 (Thu. Nov. 21). (The timing may be different next term.) The lectures will include frequent online examples and demonstrations, as well as nuggets of MATLAB. Please do not miss any lectures; we will move fast.

Reading Materials
Lecture notes (rather 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.

Homework Assignments and Course Marks
There will be four homework assignments, due at lecture at 10:00 on Tuesdays of Weeks 2, 4, 6 and at a place to be arranged on Tuesday of Week 8. We recommend producing these with MATLAB "Publish". These will be marked and returned one week later. At the end of the term, a mark in the range α–δ will be reported to each student and to his/her supervisor. The second term will follow the same pattern.

Access to MATLAB
If you don't already have access to MATLAB, you can get it from Oxford's IT Services: go to `https://register.it.ox.ac.uk/self/software`.

Course Web Page
`https://courses.maths.ox.ac.uk/node/45032.` Among other things, all the MATLAB programs demonstrated in lectures will be deposited here.