Case Studies in Scientific Computing

M.Sc. in Mathematical Modelling & Scientific Computing

Michaelmas Term 2026

Introduction

The Case Studies in Scientific Computing make up one unit of the M.Sc. course. Every student should complete one of these.

The purpose of today's lecture is to briefly outline the projects.

Allocation of Projects

Please email your ordered list of at least three projects to kathryn.gillow@maths.ox.ac.uk by 9am on Thursday of week 3 at which point the groups will be allocated and I will email out the allocations.

Group Meetings

We will meet for one hour per week in weeks 4–8 of term.

In the first weeks of each project tasks will be set to be completed by the following week. These will be solvable using Python or Matlab and techniques learnt in the core courses with hints given in class.

In the later weeks of the project we will also look at the solution to the previous week's tasks.

In the final session ideas for extensions to the project will be discussed. Whilst the majority of the work will be undertaken in groups, it is expected the extension will be completed individually.

Assessment

The assessment for the Case Studies in Scientific Computing is in the form of an individual report.

The report should primarily consist of a write up of the tasks completed weekly along with text to introduce the problem and explain the mathematics used. It should also include an individual extension to the problem.

The report should be about 15 pages up to a maximum of 20 pages without penalty. The page limits include appropriate figures and tables. It is not necessary to include your code. Guidelines for writing the case study report (font size, margins etc) are the same as for special topics.

Assessment

The report will be given a mark out of 100.

Of this, 25 marks will be for the presentation of the report (typography, graphics, prose style, clarity of mathematical expression, appropriate referencing), 25 marks will be for the individual extension and the remaining 50 marks will be for the main content of the report (is the maths right, do the numerics support the theory, can you explain unexpected results etc).

Your report should be submitted by 12 noon on Monday of week 0 of Hilary term (11th January) via Inspera.