

Course Information Sheet for entry in 2025-26: MSc in Mathematical Modelling and Scientific Computing



Course facts

Mode of study	Full Time Only
Expected length	12 months

About the course

This one-year master's course provides training in the application of mathematics to a wide range of problems in science and technology. Emphasis is placed on the formulation of problems, on the analytical and numerical techniques for a solution and the computation of useful results.

Course structure

The course consists of both taught courses and a dissertation. To complete the course, you must complete 12 units. You will accumulate four units in core courses, two units in special topics, two units in case studies and four units in the dissertation. In addition, you will attend classes in mathematical modelling, practical numerical analysis and additional skills during Michaelmas term.

Core courses (accumulating four units)

There are four core courses which you must complete (one unit each), which each usually consist of 24 lectures, classes and a written examination.

The core courses are:

- Mathematical Methods I
- Mathematical Methods II
- Numerical Solutions of Partial Differential Equations and Numerical Linear Algebra
- Numerical Linear Algebra and Continuous Optimisation.

Special topics (accumulating two units)

You must choose one special topic in the area of modelling and one in computation (one unit each). There are around 25 special topic courses to choose from, spread over the first and second academic terms, each usually consisting of 16 lectures and a mini project. Topics covered usually include mathematical biology, fluid mechanics, perturbation methods, the mathematics of data, numerical optimisation and scientific computing.

Case studies (accumulating two units)

You must undertake one case study in mathematical modelling and one in scientific computing (one unit each). These courses take place in Hilary term and normally consist of group work, an oral presentation (for mathematical modelling only) and a written report.

Dissertation (four units)

You will write a dissertation of around 40 to 50 pages. This is normally produced in the third term (Trinity term) and over the long vacation. Since there is another MSc focussed on mathematical finance specifically, the MSc in Mathematical and Computational Finance, you are not permitted to undertake a dissertation in this field.

Pattern of learning and teaching

In the first term (Michaelmas term), you should expect your weekly schedule to consist of around seven hours of core course lectures and five hours of modelling, practical numerical analysis and additional skills classes, then a further two hours of lectures for each special topic course followed. In addition, there are around three hours of classes, and you should expect to spend time working through the associated problem sheets prior to each class. There are slightly fewer contact hours in the second term (Hilary term), but you will spend more time working in groups on the case studies.

The expectation is that you will spend most of the third term and long vacation working on your dissertation. During this time, you should expect to work hours that are equivalent to full-time working hours, although extra hours may occasionally be needed. You will be expected to write special topic and case study reports during the Christmas and Easter vacations, as well as revising for the core course written examinations.

Intended learning outcomes

You will gain knowledge of:

- core methods of applied mathematics and numerical analysis;
- computer programming of mathematical algorithms;
- mathematical modelling;
- more advanced topics in modelling, methods and numerical analysis;
- how to undertake a short research project in an area of applied mathematics;
- how to communicate mathematics effectively, both orally and in written form.

Attendance

The course is full-time and requires attendance in Oxford. Full-time students are subject to the University's Residence requirements.

Resources to support your study

As a graduate student, you will have access to the University's wide range of world-class resources including libraries, museums, galleries, digital resources and IT services.

The Bodleian Libraries is the largest library system in the UK. It includes the main Bodleian Library and libraries across Oxford, including major research libraries and faculty, department and institute libraries. Together, the Libraries hold more than 13 million printed items, provide access to e-journals, and contain outstanding special collections including rare books and manuscripts, classical papyri, maps, music, art and printed ephemera.

The University's IT Services is available to all students to support with core university IT systems and tools, as well as many other services and facilities. IT Services also offers a range of IT learning courses for students, to support with learning and research.

The Mathematical Institute's home is the purpose-built Andrew Wiles Building, opened in 2013. This provides ample teaching facilities for lectures, classes and seminars. The Mathematical Institute provides IT support, and students can use the department's Whitehead Library, with an extensive range of books and journals. Wi-fi is available throughout the building. The Mathematical Institute provides six lecture theatres and six class rooms. The largest lecture theatre seats up to 360 people and all classrooms can accommodate 20 people. A shared office with desktop computers and a hot desking arrangement is allocated to students on arrival.

Graduate students have access to the department common room, where graduate students regularly gather for coffee and other social occasions and the mezzanine level of the Andrew Wiles Building houses a café and teaching spaces.

Supervision

The allocation of graduate supervision for this course is the responsibility of the Mathematical Institute and it is not always possible to accommodate the preferences of incoming graduate students to work with a particular member of staff. Under exceptional circumstances a supervisor may be found outside the Mathematical Institute.

You will be assigned an initial supervisor on arrival in Oxford whose role is to act as an academic advisor during the first two terms of the course. In the third term, your supervisor will usually change when you start work on your dissertation.

Assessment

Assessment takes place throughout the course. To complete the course, you must complete 12 units.

Each one-unit core course on mathematical methods or numerical analysis is assessed by written examination. The first two examinations on mathematical methods and numerical analysis usually take place in Week 0 of Hilary term. The second two examinations usually take place in Week 0 of Trinity term.

Each one-unit special topic culminates in an assessed written report. Special topic reports based on Michaelmas term lecture courses are generally submitted at the beginning of Hilary term and special topic reports based on Hilary term lectures courses are submitted at the beginning of Trinity term.

Each one-unit case study is taught in Hilary term. For mathematical modelling you will give an assessed group presentation at the end of Hilary term as well as submitting an individual written report at the beginning of Trinity term. For the scientific computing case study assessment will solely be based on your written report which will be submitted early in Trinity term.

Finally, you will produce a dissertation (contributing four units) during Trinity term and the long vacation and you will have an oral examination on this in mid-September. While your dissertation does not necessarily need to contain original ideas, credit will be given for originality and performance in the oral examination. In addition, the dissertation will be assessed on the mathematical content and accuracy, including the mathematical formulation of the problem and the subsequent analysis and solution, as well as the presentation, in particular whether the report is written clearly and in a scholarly manner.

Changes to this course

The University will seek to deliver this course in accordance with the description set out above. However, there may be situations in which it is desirable or necessary for the University to make changes in course provision, either before or after you commence your course. These might include significant changes made necessary by any pandemic, epidemic or local health emergency. For further information, please see the University's Terms and Conditions (<http://www.graduate.ox.ac.uk/terms>) and our page on changes to courses (<http://www.graduate.ox.ac.uk/coursechanges>).

Costs

Annual fees for entry in 2025-26

Fee status	Annual Course fees
Home	£15,300
Overseas	£41,250

Information about course fees

Course fees are payable each year, for the duration of your fee liability (your fee liability is the length of time for which you are required to pay course fees). For courses lasting longer than one year, please be aware that fees will usually increase annually. Information about how much fees and other costs may increase is set out in the University's Terms and Conditions (<http://www.graduate.ox.ac.uk/terms>).

Course fees cover your teaching as well as other academic services and facilities provided to support your studies. Unless specified in the additional cost information (below), course fees do not cover your accommodation, residential costs or other living costs. They also don't cover any additional costs and charges that are outlined in the additional cost information.

Additional cost information

There are no compulsory elements of this course that entail additional costs beyond fees and living costs. However, as part of your course requirements, you may need to choose a dissertation, a project or a thesis topic. Please note that, depending on your choice of topic and the research required to complete it, you may incur additional expenses, such as travel expenses, research expenses, and field trips. You will need to meet these additional costs, although you may be able to apply for small grants from your department and/or college to help you cover some of these expenses.

Living costs

In addition to your course fees and any additional course-specific costs, you will need to ensure that you have adequate funds to support your living costs for the duration of your course.

The likely living costs for the 2025-26 academic year are published below. These costs are based on a single, full-time graduate student, with no dependants, living in Oxford. We provide the cost per month so you can multiply up by the number of months you expect to live in Oxford.

Likely living costs for one month

	Lower range	Upper range
Food	£330	£515
Accommodation	£790	£955
Personal items	£200	£335
Social activities	£45	£100
Study costs	£40	£90
Other	£20	£40
Total	£1,425	£2,035

Likely living costs for nine months

	Lower range	Upper range
Food	£2,970	£4,635
Accommodation	£7,110	£8,595
Personal items	£1,800	£3,015
Social activities	£405	£900
Study costs	£360	£810
Other	£180	£360
Total	£12,825	£18,315

Likely living costs for twelve months

	Lower range	Upper range
Food	£3,960	£6,180
Accommodation	£9,480	£11,460
Personal items	£2,400	£4,020
Social activities	£540	£1,200
Study costs	£480	£1,080
Other	£240	£480
Total	£17,100	£24,420

When planning your finances for any future years of study at Oxford beyond the 2025-26 academic year, it is suggested that you allow for potential increases in living expenses of 4% each year – although this rate may vary depending on the national economic situation.

More information about how these figures have been calculated is available at www.graduate.ox.ac.uk/livingcosts.

Document accessibility

If you require a more accessible version of this document please contact Graduate Admissions and Recruitment by email (graduate.admissions@admin.ox.ac.uk) or via the online form (<http://www.graduate.ox.ac.uk/ask/form>).