Course Information Sheet for entry in 2024-25:
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.

The course consists of both taught courses and a dissertation. To complete the course, you must complete 12 units. You will normally 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 usually attend classes in mathematical modelling, practical numerical analysis and additional skills during Michaelmas term.

Core courses (usually 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. There is one course on mathematical methods and one on numerical analysis in both Michaelmas term and Hilary term.

Special topics (usually 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 include mathematical biology, fluid mechanics, perturbation methods, the mathematics of data, numerical optimisation and scientific computing.

Case studies (usually accumulating two units)

You must undertake at least 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 need to 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), students should expect their 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 about three hours of problem solving classes to go through core course exercises and students should expect to spend time working through the exercises then submitting them for marking prior to the class. There are slightly fewer contact hours in the second term (Hilary term), but students will spend more time working in groups on the case studies.

The expectation is that students will spend most of the third term and long vacation working on their dissertations. During this time, students should expect to work hours that are equivalent to full-time working hours, although extra hours may occasionally be needed. Students are 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

Students on the course 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.

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 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 2024-25

Fee status	Annual Course fees
Home	£13,970
Overseas	£36,000

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, 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 2024-25 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	£315	£495
Accommodation	£745	£925
Personal items	£190	£320
Social activities	£40	£95
Study costs	£35	£85
Other	£20	£35
Total	£1,345	£1,955

Likely living costs for nine months

	Lower range	Upper range
Food	£2,835	£4,445
Accommodation	£6,705	£8,325
Personal items	£1,710	£2,880
Social activities	£360	£855
Study costs	£315	£765
Other	£180	£315
Total	£12,105	£17,595

Likely living costs for twelve months

	Lower range	Upper range
Food	£3,780	£5,940
Accommodation	£8,940	£11,100
Personal items	£2,280	£3,840
Social activities	£480	£1,140
Study costs	£420	£1,020
Other	£240	£420
Total	£16,140	£23,460

When planning your finances for any future years of study at Oxford beyond 2024-25, it is suggested that you allow for potential increases in living expenses of 5% or more 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 an 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).