Course Information Sheet for entry in 2022-23: MSc in Mathematical and Computational Finance

About the course

The course provides you with a strong mathematical background with the skills necessary to apply your expertise to the solution of problems. You will develop skills to formulate mathematical problems that are based on the needs of the financial industry. You will carry out relevant mathematical and financial analysis, develop and implement appropriate tools to present and interpret model results.

The course lays the foundation for further research in academia or for a career as a quantitative analyst in a financial or other institution.

You will take four introductory courses in the first week. The introductory courses cover partial differential equations, probability and statistics, financial markets and instruments, and Python.

The first term focuses on compulsory core material, offering 64 hours of lectures and 24 hours of classes, plus one compulsory computing course offering 16 hours of lectures.

Core courses

- Stochastic Calculus (16 lectures, and 4 classes of 1.5 hours each)
- Financial Derivatives (16 lectures, and 4 classes of 1.5 hours each)
- Numerical Methods (16 lectures, and 4 classes of 1.5 hours each)
- Statistics and Financial Data Analysis (16 lectures, and 4 classes of 1.5 hours each)

Computing course

- Financial computing with C++ I (16 hours of lectures, plus 2 hours of lectures per week over weeks 1-9)

The second term will be a combination of core material, offering 48 hours of lectures (18 hours of classes) and 48 hours of electives (students will choose four electives).

Core courses

- Deep Learning (16 lectures, and 4 classes of 1.5 hours each)
- Quantitative Risk Management (8 lectures, and 2 classes of 1.5 hours each)
- Stochastic Control (8 lectures, and 2 classes of 1.5 hours each)
- Fixed Income (16 lectures, and 4 classes of 1.5 hours each)

Elective courses

- Stochastic Volatility (8 lectures, and 2 classes of 1.5 hours each)
- Advanced Monte Carlo Methods (8 lectures, and 2 classes of 1.5 hours each)
- Advanced Numerical Methods (8 lectures, and 2 classes of 1.5 hours each)
- Asset Pricing (8 lectures, and 2 classes of 1.5 hours each)
- Market Microstructure and Algorithmic Trading (8 lectures, and 2 classes of 1.5 hours each)
- Optimisation (8 lectures, and 2 classes of 1.5 hours each)

Computing course

- Financial computing with C++ II (24 hours of lectures and classes)

The third term is mainly dedicated to a dissertation project which is to be written on a topic chosen in consultation with your supervisor. This may be prepared in conjunction with an industry internship.

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

The examination will consist of the following elements:

- Three written examinations assessing the core material in the first and second terms
- One written examination assessing elective material in the second term
- Two take-home projects assessing one of the core courses in the first and one of the core courses in the second term
- Two practical examinations assessing two courses in financial computing with C++
- One dissertation in the third term.

Changes to courses

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 registration. These may include significant changes made necessary by a pandemic (including Covid-19), 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).

Expected length of course

	Full Time Only
Expected length	10 months

Costs

Annual fees for entry in 2022-23

Fee status	Annual Course fees
Home	£36,370
Overseas	£36,370

Further details about fee status eligibility can be found on the fee status webpage (http://www.graduate.ox.ac.uk/feestatus).

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.

Deposits

If your application is successful, you will be asked to pay a deposit against your course fees at the application stage as a condition of your offer. The deposit amount and date by which payment must be made are shown below.

Amount of deposit	Date by which deposit must be paid
£3,637	Between 14 and 31 days from the date on the initial offer letter. The date will be confirmed in the offer letter.

The department's website provides further information about deposits for this course.

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 2022-23 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

	Likely living costs for 1 month		Likely living costs for 9 months		Likely living costs for 12 months	
	Lower range	**Upper range**	**Lower range**	**Upper range**	**Lower range**	**Upper range**
Food	£290	£410	£2,610	£3,690	£3,480	£4,920
Accommodation	£680	£810	£6,120	£7,290	£8,160	£9,720
Personal items	£135	£260	£1,215	£2,340	£1,620	£3,120
Social activities	£45	£120	£405	£1,080	£540	£1,440
Study costs	£45	£100	£405	£900	£540	£1,200
Other	£20	£55	£180	£495	£240	£660
Total	£1,215	£1,755	£10,935	£15,795	£14,580	£21,060

When planning your finances for any future years of study at Oxford beyond 2022-23, you should allow for an estimated increase in living expenses of 3% each year.

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 the 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).