

Course Information Sheet for entry in 2022-23: Mathematics of Random Systems: Analysis, Modelling and Algorithms (EPSRC Centre for Doctoral Training)



The Mathematics of Random Systems CDT offers a comprehensive four-year doctoral training course in stochastic analysis, probability theory, stochastic modelling, computational methods and applications arising in biology, physics, quantitative finance, healthcare and data science. It provides solid training in core skills related to probability theory, stochastic modelling, data analysis, stochastic simulation, optimal control and probabilistic algorithms.

Research topics focus on five Foundation areas:

1. Stochastic analysis: foundations and new directions
2. Stochastic partial differential equations
3. Random combinatorial structures: trees, graphs, networks, branching processes
4. Stochastic computational methods and optimal control
5. Random dynamical systems and ergodic theory

and five application areas:

6. Randomness and universal behaviour in physical systems
7. Stochastic modelling and data-driven modelling in finance
8. Mathematical modelling in biology and healthcare
9. Mathematical and algorithmic challenges in data science
10. Mean-field models and agent-based modelling

In the first year, students follow four Core courses on Foundation areas and three elective courses, and choose a main research topic and a research supervisor. This research project will then be expected to evolve into a DPhil thesis in years two to four.

Throughout the four years of the course, students will participate in various CDT activities with their cohort, including a CDT spring retreat, the annual summer school as well as regular seminars, workshops and training in transferrable skills such as communication, ethics and team-working.

The CDT has multiple industry partners in the areas of data analytics, finance and healthcare who provide funding for DPhil projects linked to their areas of activity. Candidates with an interest in industry-related research projects are encouraged to apply. Industry-funded DPhil projects provide students with the opportunity to actively engage with our industry partners through collaborative research.

Supervision

Research will be supervised by CDT faculty from the Mathematical Institute or the Department of Statistics. A list of supervisors may be found on the CDT website. 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. Students interact with their research supervisor through periodic meetings and participation in seminars and working groups throughout the duration of their doctoral studies.

Assessment

The outcome of the research project will be presented in the form of a doctoral thesis which, if successfully defended, will lead to the award of the DPhil degree.

Students will be initially admitted to the status of Probationer Research Student (PRS). Within around 15 months of your course starting you will be expected to apply for transfer of status from Probationer Research Student to DPhil status.

A successful transfer of status from PRS to DPhil status will require completion of assessed work to a satisfactory level for the four core and three elective courses. You will be required to acquire transferable skills as part of your training and to complete six days of training prior to transfer of status. Students who are successful at transfer will also need to apply for and gain confirmation of DPhil status within around 39 months of admission, to show that your work continues to be on track.

Both milestones involve submission of written work and an interview with two assessors (other than your supervisor) and therefore provide important experience for the final oral examination.

You will be expected to teach at least one set of classes before transfer of status and at least two additional sets before confirmation of status.

You will be expected to submit an original thesis after three or, at most, four years from the date of admission. To be successfully awarded a DPhil in Mathematics you will need to defend your thesis orally (viva voce) in front of two appointed examiners.

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 | 4 years |

Costs

Annual fees for entry in 2022-23

| Fee status | Annual Course fees |
|------------|--------------------|
| Home | £8,620 |
| Overseas | £23,850 |

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.

Graduate students who have reached the end of their standard period of fee liability may be required to pay a termly University and/or a college continuation charge.

The University continuation charge, per term for entry in 2022-23 is £548, please be aware that this will increase annually. For part-time students, the termly charge will be half of the termly rate payable by full-time students.

If a college continuation charge applies (not applicable for non-matriculated courses) it is likely to be in the region of £100 to £600 per term. Please contact your college for more details.

Additional cost information

There are no compulsory elements of this course that entail additional costs beyond fees (or, after fee liability ends, continuation charges) and living costs. However, please note that, depending on your choice of research 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>).