

## Course Information Sheet for entry in 2026-27: Mathematics of Random Systems: Analysis, Modelling and Algorithms (CDT)



### Course facts

Mode of study	Full Time Only
Expected length	4 years

### About the course

The Centre for Doctoral Training (CDT) in Mathematics of Random Systems is a four-year doctoral programme that offers academically outstanding students training in the areas of probabilistic modelling and stochastic analysis.

You will participate in a comprehensive doctoral training course, which provides solid training in core skills related to probability theory, stochastic modelling, data analysis, stochastic simulation, optimal control and probabilistic algorithms.

### Course structure

An overview of the course structure is provided below. Details of the optional elements of the course are provided in the *Course components* section of this page.

In your first year, you will follow four courses matching your area of interest, and choose a main research topic and a research supervisor. This research project will then be expected to evolve into your DPhil thesis in years two to four.

To learn more about the research topics you'll have the opportunity to explore, please refer to the *Research areas* section on this page.

Throughout the four years of the course, you will participate in various CDT activities, including CDT social events, 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 and finance 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.

The department offers extensive support to students, from skills training and career development sessions to a variety of social events in a welcoming and inclusive atmosphere. You will have the opportunity to interact with fellow students and other members of your research groups, and more widely across the department. The department aims to offer excellent supervision and provide a stimulating research environment.

### Attendance

The course is full-time and requires attendance in Oxford. Full-time students are subject to the [University's Residence requirements](https://www.ox.ac.uk/admissions/graduate/after-you-apply/accommodation/residence-requirements). (<https://www.ox.ac.uk/admissions/graduate/after-you-apply/accommodation/residence-requirements>)

Provision exists for students on some courses to undertake their research in a 'well-founded laboratory' outside of the University. This may require travel to and attendance at a site that is not located in Oxford. Where known, existing collaborations will be outlined on this page. Please read the course information carefully, including the additional information about course fees and costs.

### Resources to support your study

As a graduate student, you will have access to the University's wide range of 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, as well as [guidance on what technology to bring with you as a new student](https://www.it.ox.ac.uk/what-to-bring) (<https://www.it.ox.ac.uk/what-to-bring>) at Oxford.

The home of the [Mathematical Institute \(https://www.maths.ox.ac.uk\)](https://www.maths.ox.ac.uk) is the purpose-built Andrew Wiles Building, opened in 2013. This provides ample teaching facilities for lectures, classes and seminars.

In year one, you will be based in a cohort study room in the Andrew Wiles Building. In years two to four, you will be allocated an office that you will share with three or six other students.

You will have your own desk with a computer. The Mathematical Institute provides IT support, and students can use the department's Whitehead Library, with an extensive range of books and journals.

## Supervision

Research will be supervised by CDT faculty from the Mathematical Institute.

A list of supervisors may be found on the [CDT website \(https://www.randomsystems-cdt.ac.uk/oxford-staff\)](https://www.randomsystems-cdt.ac.uk/oxford-staff).

It is not a requirement to contact potential supervisors prior to applying to the CDT. CDT students choose their research project and supervisor by the end of their first term, but you can indicate a preference to work with a CDT faculty member at the time of application if you have one.

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.

You will have the opportunity to interact with your research supervisor through periodic meetings and participation in seminars and working groups throughout the duration of your 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. You will be required to acquire transferable skills as part of your training amounting to five days of training prior to transfer of status. Students who are successful at transfer will also be expected to apply for and gain confirmation of DPhil status within nine terms of admission, to verify that their 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 two sets of classes before transfer of status and at least three 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.

## Course components

### Options

You will follow four courses matching your area of interest, chosen from a range of topics. Examples include:

- stochastic analysis
- probability theory
- probabilistic algorithms
- stochastic modelling
- stochastic simulation
- computational methods
- optimal control
- data analysis
- applications arising in biology
- applications arising in physics
- applications arising in quantitative finance
- applications arising in data science.

The courses offered may vary from year to year and there is no guarantee that a particular course will be available.

## Research areas

You'll have the opportunity to undertake research within the specialised themes of this course, which include:

- Foundation areas:
  - Stochastic analysis: foundations and new directions
  - Stochastic partial differential equations
  - Stochastic computational methods and optimal control
- Application areas:
  - Randomness and universal behaviour in physical systems
  - Stochastic modelling and data-driven modelling in finance
  - Mathematical and algorithmic challenges in data science
  - Mean-field models and agent-based modelling.

You will choose a main research topic and a research supervisor. This research project will then be expected to evolve into your DPhil thesis in years two to four.

The CDT has multiple industry partners in the areas of data analytics and finance 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.

## Changes to this course

The University will seek to deliver this course in accordance with the description set out in this course page. 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. The safety of students, staff and visitors is paramount and major changes to delivery or services may have to be made if a pandemic, epidemic or local health emergency occurs. In addition, in certain circumstances, for example due to visa difficulties or because the health needs of students cannot be met, it may be necessary to make adjustments to course requirements for international study.

Where possible your academic supervisor will not change for the duration of your course. However, it may be necessary to assign a new academic supervisor during the course of study or before registration for reasons which might include illness, sabbatical leave, parental leave or change in employment.

For further information please see our page on [changes to courses](https://www.ox.ac.uk/admissions/graduate/courses/changes-to-courses) (<https://www.ox.ac.uk/admissions/graduate/courses/changes-to-courses>) and the [provisions of the student contract](https://www.ox.ac.uk/admissions/graduate/after-you-apply/your-offer-and-contract) (<https://www.ox.ac.uk/admissions/graduate/after-you-apply/your-offer-and-contract>) regarding changes to courses.

## Costs

### Annual course fees

The fees for this course are charged on an annual basis.

#### Fees for the 2026-27 academic year at the University of Oxford

Fee status	Annual Course fees
Home	£10,470
Overseas	£28,980

### What do course fees cover?

Course fees cover your teaching as well as other academic services and facilities provided to support your studies. Unless specified in the additional information section 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 costs information below.

### How long do I need to pay 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 fees will usually increase annually, as explained in the University's [Terms and Conditions \(//www.ox.ac.uk/students/new/contract\)](https://www.ox.ac.uk/students/new/contract).

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

The University continuation charge, per term for entry in 2026-27 is £656, 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 will be between £150 and £500, as explained in our [information about continuation charges \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/continuation-charges\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/continuation-charges). Please contact your college for more details, including information about whether your college's continuation charge is applied at a different rate for part-time study.

### Where can I find more information about fees?

Our [fees and other charges \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges) pages provide further information, including details about:

- [course fees and fee liability \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/courses-fees-and-liability\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/courses-fees-and-liability);
- [how your fee status is determined \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/fee-status\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/fee-status);
- [changes to fees and other charges \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/changes-to-fees-and-charges\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/changes-to-fees-and-charges); and
- [continuation charges \(//www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/continuation-charges\)](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/fees-and-other-charges/continuation-charges).

Information about how much fees and other costs will usually increase each academic year is set out in the University's [Terms and Conditions \(//www.ox.ac.uk/students/new/contract\)](https://www.ox.ac.uk/students/new/contract).

### Additional costs

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 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.

### Living costs for full-time study

For the 2026-27 academic year, the range of likely living costs for a single, full-time student is between £1,405 and £2,105 for each month spent in Oxford. We provide the cost per month so you can multiply up by the number of months you expect to live in Oxford. Depending on your circumstances, you may also need to budget for the [costs of a student visa and immigration health surcharge](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs) (<https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs>) and/or [living costs for family members or other dependants](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs#field_listing_content_content-item--2) ([https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs#field\\_listing\\_content\\_content-item--2](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs#field_listing_content_content-item--2)) that you plan to bring with you to Oxford (if [dependant visa eligibility criteria](https://www.ox.ac.uk/students/visa/before/family) (<https://www.ox.ac.uk/students/visa/before/family>) are met).

### Further information about living costs

The current economic climate and periods of high national inflation in recent years make it harder to estimate potential changes to the cost of living over the next few years. For study in Oxford beyond the 2026-27 academic year, it is suggested that you budget for potential increases in living expenses of around 4% each year – although this rate may vary depending on the national economic situation.

A breakdown of likely living costs for one month during the 2026-27 academic year are shown below. These costs are based on a single, full-time graduate student, with no dependants, living in Oxford.

### Likely living costs for one month in Oxford during the 2026-27 academic year

	Lower range	Upper range
<b>Food</b>	£315	£545
<b>Accommodation</b>	£825	£990
<b>Personal items</b>	£160	£310
<b>Social activities</b>	£50	£130
<b>Study costs</b>	£35	£90
<b>Other</b>	£20	£40
<b>Total</b>	£1,405	£2,105

For information about how these figures have been calculated as well as tables showing the likely living costs for nine and twelve months, please refer to the [living costs](https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs) (<https://www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs>) page of our website.

### Document accessibility

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