Course Information Sheet for entry in 2026-27: Fundamentals of AI (EIT CDT)

Course facts

Mode of study	Full Time Only
Expected length	4 years

About the course

Fundamentals of AI (EIT CDT) is a research-based DPhil course focused on foundational AI, machine learning, and computational statistics. Students will help shape the future of AI and Machine Learning with a view to real-world impact.

The Ellison Institute of Technology (EIT) Centre for Doctoral Training (CDT) in Fundamentals of AI is dedicated to advancing foundational research in artificial intelligence and machine learning, focusing on theoretical underpinnings and methodological innovation. The CDT's aim is to develop AI technologies with the potential to drive transformative impact across key global challenges aligned with the missions of Ellison Institute of Technology.

The course will provide you with training in both cutting-edge AI research methodologies and the development of business and transferable skills. You will work with leading academics at the University of Oxford and will have the opportunity to work closely with project teams at EIT with access to both university and EIT facilities. You will undertake a significant, challenging and original research project, leading to the award of a DPhil.

While there can be many definitions of the fundamentals of artificial intelligence (FoAI), within the FoAI CDT, it is defined in three areas that allows a modern, inclusive and diverse interpretation of FoAI.

- Theory and Foundations: Researchers in this area focus on the foundational mathematical, statistical, and computational principles that underpin AI. This includes research in topics such as learning theory, optimisation, stochastic analysis, complexity theory and formal methods. The aim is to create formal frameworks for the analysis of AI algorithms and systems in order to gain insight into properties, understand behaviours and to develop improved algorithms that could have widespread general use in the field.
- Applied Fundamentals: At the FoAI CDT, researchers maybe interested in particular applications of AI relevant to EIT's Humane Themes and Scientific Programmes. Researchers in this area will examine how scientific challenges and the properties of real-world data can guide the reformulation of existing AI algorithms or the design of new algorithms entirely. Topics in this area include physical and process modelling, how to handle missing data, multimodal data integration, decision support, etc.
- Fundamentals of AI Systems and Engineering: In recent years, there has been an unprecedent emergence of large and complex AI systems, such as Large Language Models. Researchers in this area are interested in the formal frameworks for characterising the design and development of such systems and using these to further understand the properties and behaviours of such systems. They may also be interested in the security, scalability and physical resource requirements of such systems.

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

During the first year of the course you will take a number of taught courses.

The CDT directors will meet with students individually during induction and throughout the first year to create personal development plans to help identify training which would be of particular benefit.

You will undertake two 10-week exploratory projects usually with different supervisors. Towards the end of the first year, you will select a DPhil research project which may be a continuation of one of the short rotation projects, a topic from the group projects or something different.

All projects (group, rotation & DPhil) will focus on underpinning theory and method development of Artificial Intelligence and machine learning that will have the potential to have a transformative impact across a range of themes associated with EIT.

In the second year, you will move to the academic department of your main supervisor and commence your main research project.

Attendance

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

All students will receive a laptop.

You may have opportunities to access EIT resources and are encouraged to work closely with EIT research teams with possibilities to spend time on site at their hubs.

When you move out to your department you will also have access to the facilities provided by that department. You will remain a member of the CDT and will be able to return to the MPLS Doctoral Training Centre (MPLS DTC), on Keble Road, to use the facilities there.

EIT's AI researchers will be contributing towards the individually-tailored training in advanced AI techniques and software development as part of the CDT's wider training efforts. EIT researchers are engaged in internationally leading scientific research projects underpinned by cutting edge development of AI and machine learning techniques which will engage, educate and support students in their learning.

In the event of the need for pastoral care, support is available from your college, from the project supervisor, the MPLS DTC, and the CDT management team. You will have access to seminars in all four departments as well as across the wider university.

In addition to the training modules offered by the CDT, you will be able to sign up for a wide range of training courses and modules offered by departments across the university via the University's Researcher Training Tool. You will also have access to Oxford's wide library network, including the recently refurbished Radcliffe Science Library.

EIT Leadership and Innovation Programming Training Students in the CDT will also have access to EIT leadership and innovation training to support them through to graduation and beyond. With a core focus on skills building, this programming is designed to develop leadership in the context of science and technology. The programme encourages students to think critically about their role as future scientific leaders and innovators. Through a combination of expert talks, practical workshops, and peer discussions, students will have the opportunity to learn directly from leading entrepreneurs and innovators representing a diverse range of sectors.

Supervision

The allocation of graduate supervision for this course is the responsibility of the EIT CDT in Fundamentals in AI 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 CDT.

During your first year, you will be allocated a supervisor from the CDT's academic leadership team. This supervisor will act as a mentor throughout the programme. Students normally have the opportunity to meet with their supervisor at least once every two weeks, averaged across the year. These meetings will serve to monitor academic progress as well as to discuss any academic issues or questions arising.

In your second year, you will be allocated a main supervisor for your DPhil project and you will transition into their academic department where you will commence your research project. This supervisor is expected to be a member of the FoAI Supervision Pool. Students are encouraged to include additional co-supervisors from EIT. Additional co-supervision may also be arranged with Oxford academics beyond the supervisor pool.

Assessment

Taught courses are generally assessed by a presentation in small groups on the material studied. Each of the two rotation projects will be assessed by researchers from the supervisor pool on the basis of a report written by the student. The year-long group project will be assessed by a joint presentation around the end of the first year.

All students will be initially admitted to the status of Probationer Research Student (PRS). Within a maximum of six terms, students 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 the submission of a thesis outline. Students who are successful at transfer will also be expected to apply for and gain confirmation of DPhil status to show that their work continues to be on track. This will need to be completed within ten terms of admission.

Both milestones normally involve an interview with two assessors and therefore provide important experience for the final oral examination. Students will be expected to submit a thesis at four years from the date of admission.

The final thesis is normally submitted for examination during the fourth year and is followed by the viva examination. The final award for Oxford based students will be a DPhil awarded by the University of Oxford.

To be successfully awarded a DPhil you will need to defend your thesis orally (viva voce) in front of two appointed examiners.

Research areas

Areas of research

Foundations

Researchers in this domain are primarily focused on deep mathematical analysis for the development and further understanding of concepts that have potential broad application to AI such as learning theory, optimisation and stochastic analysis. They may also undertake mathematical analysis of AI methods whose utility have been demonstrated through empirical studies but where theoretical insight has been absent.

Applied

Researchers in this domain are inspired by real-world problems and will focus on developing substantial modifications of foundational concepts to match the particular needs of applications examining issues such as multimodal data integration, missing data, experimental design and causality. They may consider existing heuristically designed AI methods that have demonstrated high performance in applications and reformulate using foundational concepts to improve and extend the use of these approaches.

Systems

Researchers in this domain are concerned with the design, deployment and/or maintenance of large scale AI systems. They could apply formal analysis to understand the properties of such AI systems or substantially adapt and develop foundational concepts to assist in the design of better systems. Research may address topics such as scalability, resource use, safety and algorithmic fairness.

Course components

Compulsory modules

You will take the following training course and modules:

Software Engineering Training

Training will begin with an immersive module in software engineering that will lay the foundation for a year-long, team-based open-source software development project. This course introduces software engineering and is offered to all 1st year students at the MPLS Doctoral Training Centre. It covers the main software architecture paradigms: procedural, object-orientated and functional programming, version control with Git, testing and continuous integration, project packaging and containerisation, an intro to using HPC clusters and computational workflows with snakemake.

Fundamentals of AI I: Foundational Concepts.

This module provides a rapid introduction to key topics that underpin modern artificial intelligence research. The objective is to provide an understanding of the fundamental concepts that underpin the current state of the art and to be able critically assess how their DPhil can contribute to advancing knowledge. The module will provide students with an awareness of a breadth of concepts that will allow them to make connections between areas during their DPhil and beyond. Topics will include areas such as Learning theory, Bayesian methods, Reinforcement Learning and Diffusion Processes.

Fundamentals of AI II: Modern Statistical Concepts

This module introduces you to current research developments at the interface between Statistics and AI, while also providing an opportunity to interact with module leaders and ECRs from the Department of Statistics and engage with their research

areas and interests. The module will cover topics such as Bayesian Uncertainty Quantification, Statistical Wrappers for Black-Box ML Methods and Deep Generative Modelling.

Emerging Research and Skills

These will be short sessions led by the leading academics in our supervision pool. They will expose you to some of the cutting-edge research in AI at the University and give you opportunities to connect with the researchers. Many of you may have ideas about what you want to do now, but we hope these sessions will highlight areas and topics that you have not considered before and trigger new ideas.

Wider AI skills training

These sessions will be looking at areas such as data management, high-performance computing, research publishing, ethics and regulation.

Group projects

Early on in your first term, you will work in a team to consider a substantive AI problem that you will work on together throughout the first year. This will be a chance for you to engage closely with EIT teams early in your DPhil. These projects will be one of your main occupations during the second term of the first year. Time will be set aside to continue working on these projects during the third term and the summer alongside your individual projects.

Rotation projects

You will undertake two individual rotation projects between April and September (with time set aside to keep the group projects going). These will be carried out under the supervision of academics from the supervisor pool but you will be encouraged to include additional co-supervisors from EIT. Additional co-supervision may also be arranged with Oxford academics beyond the supervisor pool. During this time, you will be based in the home department of the rotation project supervisors.

DPhil project

In the second year, you will move to the academic department of your main supervisor and commence your main research project.

Further training opportunities

EIT Leadership and Innovation Programming Training (Years 1-4)

Students in the CDT will have access to EIT leadership and innovation training to support them through to graduation and beyond. The programming is built around key principles that nurture holistic growth and empower students to lead with purpose and innovation: Leadership Development, Innovation and Entrepreneurship, Community and Personal and Lifelong Development. The programme aspires to cultivate a lifelong network of impact-driven leaders and innovators. The training emphasises self-leadership, personal values and the skills needed to lead others and systems. The programme will provide students with access to top innovators and experts, along with opportunities to learn both the theory and practice of entrepreneurship. The training is delivered through a variety of formats, including expert talks, practical workshops and peer discussions.

MPLS Doctoral Training Centre Research and Professional Skills Training (Years 1-4)

Studying for a DPhil requires an aptitude for original, independent and critical thinking, as well as the ability to write papers, present data and manage projects. The Research and Professional Skills programme, which runs throughout the four years at the Doctoral Training Centre, is designed not only to equip students with the necessary skillset to carry out their research at Oxford but also provides an opportunity to develop personal transferable skills. Through a series of lectures and seminars students will be able to improve their competence and confidence as researchers. These qualities are not only key in research but equally important in many careers. Research and Professional Skills training covers scientific methodology, public engagement with science, reading scientific literature across disciplines, scientific writing, poster production, publishing a research paper, presentation and communication skills, management skills, managing your DTC DPhil, IP and commercialisation of research, research ethics, introduction to entrepreneurship, interview techniques and career development.

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 (//www.ox.ac.uk/admissions/graduate/courses/changes-to-courses) and the provisions of the student contract (//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	£34,700

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) .

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) . 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) 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) ;
- how your fee status is determined (//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) ; and
- continuation charges (//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) .

Additional costs

This course includes compulsory elements that entail additional costs beyond fees (or, after fee liability ends, continuation charges) and living costs. For those students in receipt of a full CDT studentship award, an additional research training support grant (RTSG) to cover costs of associated equipment, research and travel will be provided. Students who are not in receipt of a full CDT studentship award will need to cover these course-related costs. Individual research projects come with variable research costs and students will need to discuss these with their supervisor and plan a budget for their project. In some cases students may need to apply for additional funding, either from the RTSG or other sources. Students should always involve their supervisor with such funding requests.

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 (//www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs) and/or living costs for family members or other dependants (//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 (//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
Food	£315	£545
Accommodation	£825	£990
Personal items	£160	£310
Social activities	£50	£130
Study costs	£35	£90
Other	£20	£40
Total	£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 (//www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs) page of our website.

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).