Course Information Sheet for entry in 2026-27: Fusion Power (EPSRC CDT)

Course facts

Mode of study	Full Time	Part time
Expected length	4 years	8 years

About the course

The Fusion Power (EPSRC CDT) is a research-based course combining training and research in fusion-relevant fields like plasma physics, materials science, and computational modelling, with initial taught modules followed by a major research project.

The Fusion Power Centre for Doctoral Training (CDT) is provided by a collaboration between six UK universities (Durham, Liverpool, Manchester, Oxford, Sheffield, and York), other research organisations including Culham Centre for Fusion Energy, and industry such as Tokamak Energy, First Light Fusion and OxfordSigma.

You will be trained to doctoral-level (a PhD is known as a DPhil at Oxford) in disciplines related to fusion power. A significant number of fully-funded four-year full-time and eight-year part-time doctoral studentships are expected to be available each year. The CDT expects to train at least 80 students over five intakes from 2024 to 2028.

You will train and study alongside students undertaking the DPhil in Materials, together forming an Oxford cohort of research students in materials. The majority of projects are expected to collaborate with the wider fusion industry. In Oxford, students will focus on materials for fusion power.

The plasma-facing components, magnets and breeding blanket of any future fusion tokamak will be subjected to some of the most extreme engineering environments possible, with high temperatures, stresses and extreme levels of radiation damage. For fusion to be feasible as an economic power source, the materials used must be able to survive these conditions, retaining usable thermal and mechanical properties, for five years or more. Fusion CDT projects in Oxford will work on solving these challenges and making fusion a reality.

You will have access to a range of fusion materials facilities within Oxford and across the UK, and international links provide access to many other fusion devices around the world.

The combination of world-leading experts and world-class facilities creates an outstanding training environment for the next generation of fusion scientists - the generation who may exploit STEP, ITER, NIF and other international experiments to make fusion energy a reality.

Course structure

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

The course is normally carried out in four years of full-time study (or eight years of part-time study) under the supervision of an experienced member of staff. The first year (first two years for if you are studying part-time) will be focused on training. All students are registered at the University of Oxford.

If studying full-time, you will spend the first eight months of the course (the first 16 months if studying part-time), attending a number of intensive one-week or two-week technical fusion modules designed to provide the best possible platform for your substantial research project. Please note that the modules offered may change to reflect the latest academic thinking and expertise of staff.

During your first year if studying full-time (your first two years if studying part-time) , you will also attend 'Frontiers of Fusion and Interfaces', an annual workshop which features fascinating talks by well-known and internationally-respected external speakers. Students from all cohorts (and their supervisors) will gather for a scientific meeting exploring a range of fusion issues and how they link to related fields, such as fission, advanced instrumentation, technological plasmas, and more.

The remaining three years of the full-time course (six years if studying part-time) will be spent conducting research.

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

Attendance

The course can be studied full-time or part-time with both modes requiring 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) Part-time students are required to attend course-related activities in Oxford for a minimum of 30 days each year.

The full-time course is usually studied over four years. The part-time course is usually studied over eight years.

These intensive one-week or two-week technical fusion modules are run by all six partners and will be taught at the other collaborating universities, with periods in between courses spent in Oxford completing the course work assignments. Travel and subsistence funds are provided for attending the different modules.

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.

The department has excellent and wide-ranging research resources including:

- a world-class suite of electron microscopy facilities including analytical STEMs and TEMs, three FIBs and two ultrahigh resolution SEMs optimised for EBSD and EDX analysis, together with a number of supporting and training instruments. Much of this equipment is installed in the David Cockayne Centre for Electron Microscopy (https://www-em.materials.ox.ac.uk/#/);
- additional electron microscopy facilities (https://www.materials.ox.ac.uk/electron-physical-science-imaging-centre-epsic) are available at the national electron Physical Science Imaging Centre;
- extensive further facilities for characterising materials including, for example, AFM, XPS, and Raman microscopy;
- clean room facilities;
- nanomechanical characterisation equipment;
- special processing or manufacturing facilities for polymers, ceramics, carbon nanomaterials, rapidly solidified materials and devices such as novel batteries or superconductors;
- superb facilities for 3-D atom probe analysis (including LEAP 5000XS and LEAP 5000XR);
- an alloy processing and mechanical properties laboratory, for aerospace and nuclear materials; and
- a wide range of specialist modelling software (https://www.materials.ox.ac.uk/local/it/software.html) and if appropriate for your research project, access to Oxford's Advanced Research Computing (https://www.arc.ox.ac.uk/) facilities.

In addition to the excellent central and college library provision, there is a specialist Materials Science Library housed within the department.

Supervision

The allocation of graduate supervision for this course is the responsibility of the Department of Materials 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 Department of Materials.

Typically, you will have the opportunity to meet with your supervisor approximately every two to three weeks.

Assessment

All students will be initially admitted to the status of Probationer Research Student (PRS). Normally after six terms as a full-time PRS student, and 12 terms as a part-time PRS students, 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 the taught aspects of the Fusion Power course and a report on the first months of work on your DPhil project.

If successful at transfer, you will also be expected to apply for and gain confirmation of DPhil status within ten terms of admission (within 20 terms if studying part-time), to show that your work continues to be on track.

Both milestones normally involve an interview with at least two assessors (other than your supervisor) and therefore provide important experience for the final oral examination.

You will be expected to submit a substantial thesis after four years from the date of admission if studying full-time (eight years if part-time). To be successfully awarded a DPhil you will need to defend your thesis orally (viva voce) in front of two appointed examiners.

Course components

If studying full-time, you will spend the first eight months of the course (the first 16 months if studying part-time), attending a number of technical fusion modules designed to provide the best possible platform for your substantial research project. Please note that the modules offered may change to reflect the latest academic thinking and expertise of staff. Some examples of modules include:

- Introduction to Fusion Plasmas
- Introduction to Materials
- Plasma Facing Technologies
- Irradiation Damage and Degradation
- Leadership and Research skills
- Tritium and the Fusion Fuel Cycle
- Plasma Surface Interactions Lab
- Functional and Superconducting Technologies
- Data Management and Software Skills
- Analytical Tools for Fusion Materials
- Manufacturing and Design Codes
- Multi-scale Computational materials engineering.

These intensive one-week or two-week modules are run by all six partners and will be taught at the other collaborating universities, with periods in between courses spent in Oxford completing the course work assignments.

During your first year (your first two years if studying part-time), you will also attend 'Frontiers of Fusion and Interfaces', an annual workshop which features fascinating talks by well-known and internationally-respected external speakers.

While first year of the course (two years if studying part-time) will be focused on training, the remaining three years of the course (six years if studying part-time) will be spent conducting research.

Research areas

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

- the characterisation of materials, where there is emphasis on electron microscopy and related techniques associated with radiation damage;
- processing and manufacturing of new materials for fusion;
- modelling of materials, where there is attention to both structures and processes;
- properties of materials needed to realise fusion; and
- development and understanding of functional materials such as tritium breeding ceramics or superconducting materials.

Much of this world-leading research is carried out in close collaboration with industry. Research interests in Oxford's Department of Materials extend over most branches of materials science, as well as some aspects of solid-state physics and chemistry. These include the study of a wide range of materials of relevance in advanced technological applications.

The University offers a range of projects, both experimental and modelling, on the processing, joining, microstructure, mechanical properties, and resistance to radiation damage of these materials. Projects will use a range of specialised research techniques, usually in combination:

- advanced processing, coating and joining methods (mechanical alloying, rapid solidification, spray forming, additive manufacture, friction-stir welding);
- irradiation of materials by high-energy ion-beams, protons and neutrons;
- liquid metal corrosion;
- characterisation of superconducting materials;
- electron microscopy of microstructures, and radiation damage effects, including in-situ irradiations, and field-ion microscopy of radiation damage;
- microanalysis by atom-probe tomography and electron-optical methods;
- X-ray diffraction including use of the diamond light source mechanical testing, including micromechanics, over a wide temperature range; and

- computer modelling of radiation damage effects, deformation and microstructural 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 for the 2026-27 academic year at the University of Oxford

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

Full-time study

Fee status	Annual Course fees
Home	£10,470
Overseas	£34,700

Part-time study

Fee status	Annual Course fees
Home	£5,235
Overseas	£17,350

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

Full-time study

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.

Part-time study

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 (//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).

Living costs for part-time study

Your living costs may vary depending on your personal circumstances but you will still need to cover your cost of living on a full-time basis for the duration of your course, even if you will not be based in Oxford throughout your studies. While the range of likely living costs for a single, full-time student living in Oxford in the 2026-27 academic year is between £1,405 and £2,105 per month, living costs outside Oxford may be different.

Part-time students who are not based in Oxford will need to calculate travel and accommodation costs carefully. Depending on your circumstances and study plans, this may include the cost of a visitor visa to attend for short blocks of time (//www.ox.ac.uk/admissions/graduate/fees-and-funding/living-costs) (if visitor visa eligibility criteria (//www.ox.ac.uk/students/visa/before/visitors) 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).