

## Course Information Sheet for entry in 2024-25: MSc in Nanotechnology for Medicine and Health Care



### Course facts

Mode of study	Part Time Only
Expected length	2 to 4 years

### About the course

The University of Oxford Institute of Biomedical Engineering (Department of Engineering Science) and the Department for Continuing Education, in collaboration with Begbroke Science Park, offer the part-time MSc in Nanotechnology for Medicine and Health Care.

This advanced modular course is delivered by leading scientists and experts in this rapidly developing field and has been specifically designed for those who would value a part-time modular learning structure, for example those in full-time employment.

Nanomedicine is at the forefront of modern healthcare. Nanoparticles offer a new platform for drug delivery that can extend the 'patent life' of drugs, but also greatly increase the targeting and effectiveness of therapy. They can also enhance most of the medical imaging modalities, and in some cases offer a combined diagnostic and therapy, now called 'theranostics'.

Nanoparticle-based medicines are now becoming part of the mainstream approaches for diagnostics and therapy. A 2016 review identified 51 FDA-approved nanomedicines and 77 products undergoing clinical trials. By August 2018, 151 clinical trials using nanomaterials were completed or underway. Whilst most of these used fairly simple single-phase materials, there is a growing trend for more complex multi-functional nanomaterials and there are exciting possibilities ahead. Prime examples being the recent use of lipid nanoparticle (LNP)-based agents to deliver nucleotide payload for vaccination (COVID-19 Vaccines | FDA) and in liver directed gene therapy approaches (FDA approves first-of-its kind targeted RNA-based therapy to treat a rare disease | FDA). In addition to which a range of nanoscale viral-based vectors continue to make progress and achieve approval (FDA Approves First Gene Therapy to Treat Adults with Hemophilia B | FDA).

Nanotechnology is providing the basis for many of the new regenerative medicine approaches that are based on artificial scaffold structures and it offers solutions for many of the new generation of point-of-care biosensors and some of the advanced gene sequencing instrumentation. There are already early indications of improved healthcare outcomes, and the creation of new business and industry.

The University of Oxford Institute of Biomedical Engineering (IBME), an Institute within the Department for Engineering Science, is a world-class interdisciplinary centre for biomedical engineering research, where engineers and clinicians collaborate to address unmet needs in the prevention, early diagnosis and treatment of major diseases and conditions. The Institute's core research missions are to develop novel medical devices, technology and systems capable of delivering substantial healthcare benefit, and to translate new engineering technologies into clinical practice.

The MSc in Nanotechnology for Medicine and Health Care draws on the world-class research and teaching in nanotechnology and nanomedicine at the University of Oxford and aims to provide you with the necessary training to enable you to understand the principles of nanotechnology and its application in medical research and clinical practice.

The programme will appeal to professionals working in the commercial or healthcare sectors who develop or use nanotechnology in their work, including:

- biomedical engineers
- materials scientists
- biotech-entrepreneurs
- medical practitioners and dentists
- chemists and pharmacists
- electrical engineers
- project managers in related industries
- patent agents and patent lawyers
- legislators
- clinical research fellows, graduates and other researchers in a related area of science.

### Course structure

The course is taken part-time as a mixture of online and face-to-face modules, consisting of six modules and a research project and associated dissertation. The programme is normally completed in two to three years. Students are full members

of the University of Oxford and are matriculated as members of an Oxford college.

The course uses a blend of individual study together with group work during live online tutorials, conventional lectures and discussions and also requires the student to submit a dissertation reporting an original piece of nanomedicine-based research. The group sessions with tutors are particularly valuable because they offer highly focused learning and assessment opportunities.

The course comprises:

- three online modules giving a thorough introduction to the fundamental science of nanotechnology and the behaviour and characterisation of nanoscale materials;
- three five-day residential modules taught face-to-face in Oxford explaining the scientific, regulatory, clinical and commercial aspects of the application of nanotechnology to medicine and healthcare; and
- an original research project of approximately 18 weeks to be written up as a dissertation.

The three online modules can be taken from anywhere in the world with tutors who provide online support and electronically replicate the Oxford tutorial system, whereas the three face-to-face modules offer intense, focused lectures from Oxford academics from a range of disciplines with expertise in this field. Assessment throughout the modules ensures that students can monitor their progress.

It is recommended that students plan to spend at least 10-15 hours per week in private study in addition to time spent in classes or participating in on-line learning.

Programme modules:

- The Wider Context of Nanotechnology
- The Fundamental Science of Nanotechnology
- Fundamental Characterisation for Nanotechnology
- Introduction to Bionanotechnology
- Nanomedicine – Science and Applications
- Clinical Translation and Commercialisation of Nanomedicine

## Supervision

The allocation of graduate supervision for this course is the responsibility of the Department of Engineering Science and/or the Department for Continuing Education, and this role will usually be performed by the Course Director.

It is not always possible to accommodate the preferences of incoming graduate students to work with a particular member of staff. A supervisor may be found outside the Department of Engineering Science and/or the Department for Continuing Education.

## Assessment

To qualify for the award of an MSc, you will need to:

- Complete and pass six taught modules, submitting one or more written assignments with each module. All modules are compulsory. Modules 1-3 are taught online, Modules 4-6 in person in Oxford. You will also be expected to attend a Residential Weekend in Oxford at the end of Module 3.
- Feedback will be provided for each submission when marks are released. Assessment is summative and weighted marks for each assignment will count towards your overall result for the MSc. Full details of the assessment structure are included in the Course Handbook provided to on-course students.
- You will need to submit a research dissertation of up to 15,000 words. You will be expected to define your own dissertation topic in consultation with your allocated supervisor and the Course Director. You must submit your proposed title no later than the ninth term of study. You will have three terms to complete and submit the dissertation. Students normally begin work on their dissertation project in October with submissions due the following September.

## Changes to this course

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 you commence your course. These might include significant changes made necessary by any pandemic, 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>).

## Costs

### Modular course fees

The fees for this course are charged on a modular basis. You will pay an annual course fee and an additional fee for each module studied. A minimum of two annual course fees are payable for this course. If this course includes a dissertation, three module fees will be charged for the dissertation.

The annual course fee differs depending on whether you enter the MSc directly, or whether you first complete the PGCert in Nanotechnology, as shown below. Please refer to the course page on the department's website for further information about the fee structure (see under *Further Information and Enquiries*).

#### Fees for the 2024-25 academic year (direct entry to MSc)

Fee status	Annual Course Fee	Fee per module	Total estimated fees
Home	£4,945	£2,570	Please see the department's website for further details
Overseas	£4,945	£2,570	

#### Fees for the 2024-25 academic year (entry following PGCert in Nanotechnology)

Fee status	Annual Course Fee	Fee per module	Total estimated fees
Home	£6,515	£2,570	Please see the department's website for further details
Overseas	£6,515	£2,570	

### Information about 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, 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.

### Additional cost information

Please note that this course requires that you attend in Oxford for teaching, and you may incur additional travel and accommodation expenses for this. Further, as part of your course requirements, you may need to choose a dissertation, a project or a thesis topic. 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.

If you are studying part-time your living costs may vary depending on your personal circumstances but you must still ensure that you will have sufficient funding to meet these costs for the duration of your course.

The likely living costs for 2024-25 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 for one month

	Lower range	Upper range
<b>Food</b>	£315	£495
<b>Accommodation</b>	£745	£925
<b>Personal items</b>	£190	£320
<b>Social activities</b>	£40	£95
<b>Study costs</b>	£35	£85
<b>Other</b>	£20	£35
<b>Total</b>	£1,345	£1,955

### Likely living costs for nine months

	Lower range	Upper range
<b>Food</b>	£2,835	£4,445
<b>Accommodation</b>	£6,705	£8,325
<b>Personal items</b>	£1,710	£2,880
<b>Social activities</b>	£360	£855
<b>Study costs</b>	£315	£765
<b>Other</b>	£180	£315
<b>Total</b>	£12,105	£17,595

### Likely living costs for twelve months

	Lower range	Upper range
<b>Food</b>	£3,780	£5,940
<b>Accommodation</b>	£8,940	£11,100
<b>Personal items</b>	£2,280	£3,840
<b>Social activities</b>	£480	£1,140
<b>Study costs</b>	£420	£1,020
<b>Other</b>	£240	£420
<b>Total</b>	£16,140	£23,460

When planning your finances for any future years of study at Oxford beyond 2024-25, it is suggested that you allow for potential increases in living expenses of 5% or more each year – although this rate may vary depending on the national economic situation.

More information about how these figures have been calculated is available at [www.graduate.ox.ac.uk/livingcosts](http://www.graduate.ox.ac.uk/livingcosts).

## Document accessibility

If you require an accessible version of this document please contact Graduate Admissions and Recruitment by email ([graduate.admissions@admin.ox.ac.uk](mailto:graduate.admissions@admin.ox.ac.uk)) or via the online form (<http://www.graduate.ox.ac.uk/ask>).