

Imperial College
London



nanomaterials

MRes research and taught masters in nanomaterials

01 MRes./ research masters

Nanotechnology represents a fundamental change in the way we interact with the natural world, and is set to deliver some of the major scientific and technological advances of the new century. The massive global investment in nanotechnology means that scientists who are trained to work effectively in an interdisciplinary environment – bridging the diverse fields of chemistry, physics, materials science and engineering – will play a vital role in shaping the future.

Combining interdisciplinary teaching with cutting edge research, Imperial College's flagship Masters Degree in Nanomaterials is designed to train the next generation of nanotechnologists. Imperial College is a world class research institution with internationally leading expertise and facilities. Its nanomaterials course is a demanding one and competition for places is intense. Academic excellence and a willingness to work in an interdisciplinary environment are a prerequisite. Successful candidates will receive generous funding, carry out a major year long research project, visit state-of-the-art research laboratories in industry and academia, and discuss their work at a fully funded conference in the USA.



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what is nanotechnology?

Nanotechnology is the manipulation of matter on a nanometre scale in order to engineer new materials and devices with superior chemical, physical, optical, electronic and/or biological properties.

Nanotechnology has far reaching implications for engineering, medicine, physics, biology, energy production and computing to list but a few; its commercial potential is widely recognised both at a European and a wider international level, most notably by the USA government – whose annual federal research spending on nanotechnology is currently running at \$1.3 billion.

However, there is much public uncertainty about the merits and risks of nanotechnology. The challenge facing nanotechnologists is to push forward the frontiers of research whilst retaining the confidence and support of the wider public.



_03 course outline



The MRes degree is based around a year long interdisciplinary project of original research supported by taught courses in all major areas of nanomaterials science. The programme is available only as a full-time one-year course and successful completion leads to the MRes degree.

Highlights of the degree include:

- Taught courses in all major areas of nanomaterials science
- The Nanotechnology Foresight Lectures
- State-of-the-art research project in nanomaterials
- Attendance at a fully funded nanomaterials conference (NanoTech 2007, USA)
- Extensive training in transferable skills

_04 taught courses

You will attend approximately eighty hours of formal lectures at the start of the course on a wide range of topics in nanomaterials, which will be examined in January and February. The remainder of the course is devoted to full time research.

The lectures address recent developments in nanomaterials research, and will involve extensive discussion of the scientific literature.

The main lecture courses are:

- Modelling of Nanomaterials
- Supramolecular Chemistry
- Semiconductor Nanomaterials
- Optoelectronic Nanomaterials
- Carbon Nanotubes
- Bio-Nanomaterials

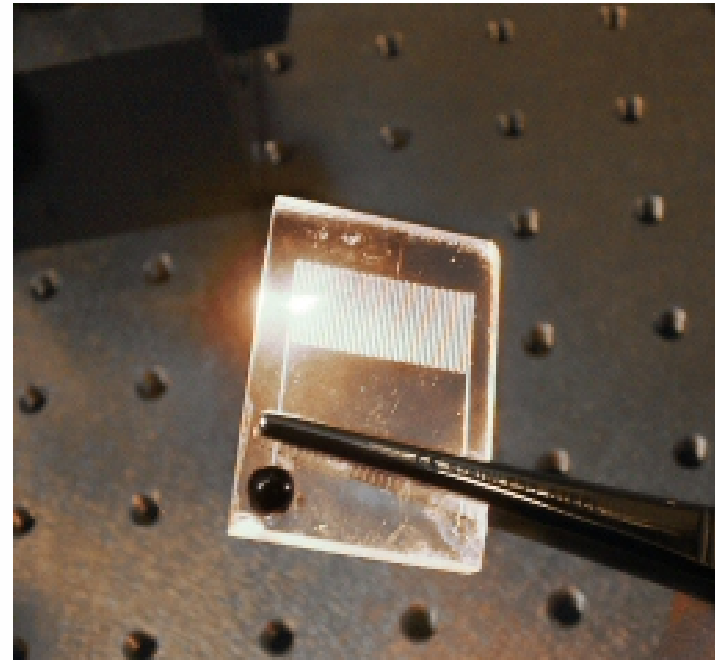


_05 nanotechnology foresight

Specially invited guest speakers from industry and academia will provide you with an insider's perspective of the future for nanotechnology. The programme will involve short study visits to industrial partners (including US and/or European centres) and a fully funded two week visit to Nanotechnology Centres in the USA. You will gain a broad understanding of nanotechnology research, hear about the latest developments in nanotechnology, and will learn how current research is evolving into future technology.

Previous Speakers Have Included:

- Prof. O' Brien, Manchester University
- Prof. Niemeyer, University of Dortmund
- Prof. Welland, Cambridge University
- Prof. Tildesley, Unilever
- Dr. Scheuring, Institut Curie Paris

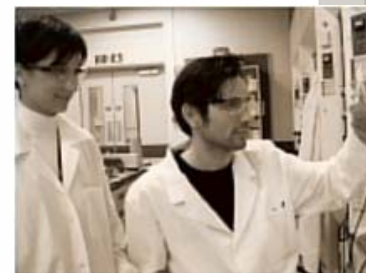


_06 research project

The Chemistry Department at Imperial College is an internationally leading research centre, and achieved the top 5* rating in the Government's most recent assessment of research quality. During the course you will work in one of the Department's many research groups specialising in Nanomaterials research. Working alongside internationally leading researchers, you will acquire unrivalled research experience and, on completion of the course, will be able to plan and execute safely complex experiments, analyse data, prepare technical reports, give technical presentations and assimilate key ideas from the scientific literature. You will be strongly encouraged to publish the results of your research in a peer-reviewed international journal. In short, on completion of the MRes, you will be fully equipped to begin a PhD or embark on a career in nanomaterials research.

In previous years, experimental and theoretical research projects have been offered in the following areas:

- organic light-emitting diodes
- organic and dye-sensitised solar cells
- carbon nanotubes
- nanoparticle synthesis and characterisation
- self-assembly of nanomaterials
- high resolution microscopy
- microfluidic synthesis of nanomaterials



_07 USA conference

A key element of the nanomaterials programme is a series of visits to nanotech centres and events abroad. The purpose of the visits is to provide you with a relaxed and informal opportunity to speak with leading figures in the field and to network with researchers from nanotech companies. The cost of the two week trip is fully inclusive in the tuition fees.



In 2006, the class visited Boston, Massachusetts. This year's visit is to Santa Clara.

2006 Boston Ma

- meeting at British consulate with CEOs from hi-tech start-ups
- visit to the Harvard Nanoscale Centre
- visit to the Nanomanufacturing Centre in Amhurst
- visit to the Nanocentre at North Eastern University
- Nanotech 2006 Conference and Tradeshow

08 transferable skills

The MRes places strong emphasis on the development of transferable skills that are of general use in an industrial or academic environment.

Relevant courses include:

Intellectual property management

This module covers patents, licensing and joint ventures, and provides an opportunity to meet the Imperial College faculty responsible for commercialisation of academic research.

Presentation and communication skills

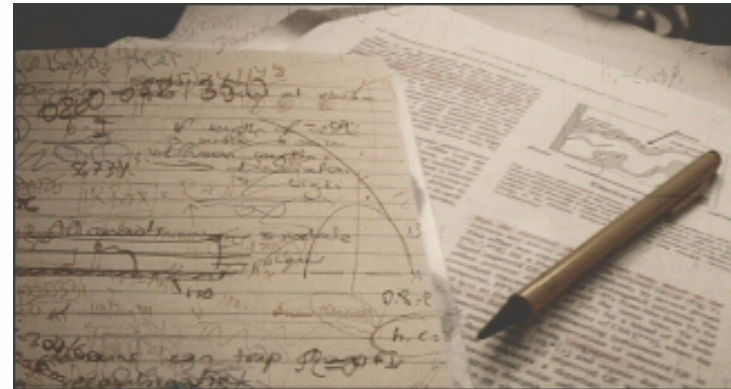
This course provides expert tuition in delivering scientific presentations and dealing with the media.

Safety awareness

Chemical and biological safety. Discussion of safe working practice and the legislation governing health and safety, particularly in the context of managerial responsibilities.

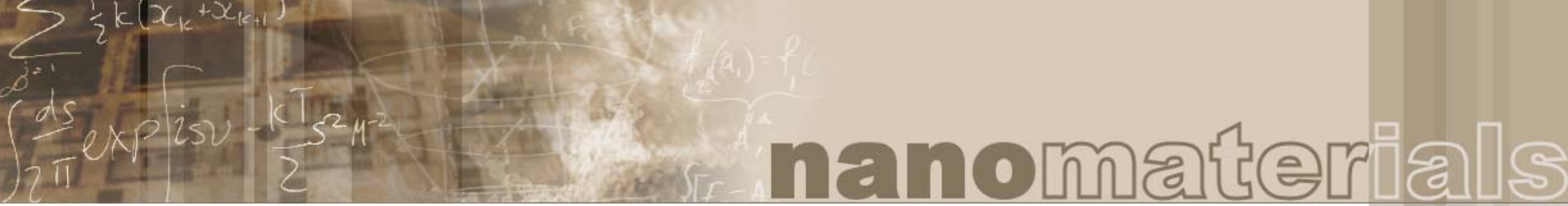
Science and Society

The Centre for Science Communication will lead a workshop on Science and Society which examines the role of science in the modern world and how it is reported in the media.



As a postgraduate, you will also automatically become a member of GSEPS (Graduate School of Engineering and Physical Sciences), which runs a range of short courses to aid you in your studies and improve the effectiveness of your work. Example courses include:

- Interviews with Video Playback
- Intellectual Property Rights
- Issues in Science: Research Ethics
- Thesis Writing
- Negotiation and Influencing
- Effective Communication
- Information Retrieval
- Time Management
- Technical Presentations
- Assertiveness Workshop



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_09 who for?



Interdisciplinary collaborations are often difficult because of the subtle differences in language, perspective and methodology associated with the different disciplines. The MRes in Nanomaterials is specifically designed to enable physicists, chemists, biologists, materials scientists and engineers to bridge these gaps and to make a successful transition to fully interdisciplinary working environments.

The course does not assume any previous knowledge of nanomaterials, but candidates should have obtained or expect a 1st or a good 2.1 in a relevant undergraduate degree subject. A commitment to a career in nanotechnology is part of the selection process.

_10 funding



There are up to 7 fully funded EPSRC studentships available for UK and EU students. The funding covers your tuition fees of £3,168, around £14,300 bursary for living expenses, and additional costs you may incur while on overseas visits.

Those wishing to join the course from outside the EU will have to fund themselves and pay tuition fees of £19,900.

11 students' views



Ben, France

My previous studies were in chemistry and physics, and I wanted to keep a link between the two. This MRes seemed to offer me a nice way to do it, and I get to spend a year studying abroad. It's a bit like doing a PhD, but not taking 3 years to do it.

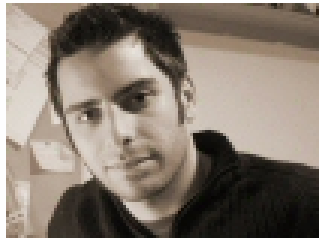


Irene, Italy

If you like the university life and research, then this MRes could be perfect for you... It has been for me. I'm learning a lot of new techniques and very interesting science.

Omar, UK

Having made it onto the course with a background in physics, I wasn't exactly sure how I'd fit into Imperial's chemistry department. It soon became obvious that the idea behind the course is exactly that: a mixture of scientists learning and thinking together. Loving London, working hard, and thoroughly enjoying the course.



Siva, UK

The course gave me a good insight into the field of nanotechnology and its future applications. The lectures, research work and lab visits were balanced, and the trip abroad was a good opportunity to meet other researchers in similar fields. You'll get a solid foundation if you are looking to work in the nanotechnology field, whether it turns out to be a PhD or a career in industry.

_12 how to apply

There is no closing date for submissions, but you should apply early as all funded studentships are usually allocated by mid April. Interviews with the Course Director Dr. John de Mello will be held from February onwards.

For information about Imperial College's application process, please visit: www.imperial.ac.uk/P1212.htm

If you have any questions please contact Lisa Benbow: l.benbow@imperial.ac.uk

You can download the application and instructions from here: www.imperial.ac.uk/p1397.htm

Applications should be returned to:

**Doris Pappoe
Chemistry Department
Imperial College
London
SW7 2AZ**