

MANCHESTER  
1824

The University of Manchester

# MATERIALS SCIENCE AND ENGINEERING

POSTGRADUATE COURSES

SHAPE YOUR FUTURE

Learn today, lead tomorrow

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# SHAPE YOUR FUTURE: CAREERS



We are ranked 2nd in the UK for research power in Engineering. Overall research quality in REF 2021



Ranked top ten globally for action towards the UN Sustainable Development Goals. THE University Impact Rankings 2022



28th best university in the world, 9th in Europe and 6th in the UK. QS World Rankings 2023



Manchester has been voted the top city to live in the UK, and the third best in the world. The Economist's Global Liveability Index 2022 and Time Out Magazine survey (2021) respectively

[Read more about our rankings and reputation including REF results.](#)

## CAREER CATEGORIES

Master's courses at The University of Manchester are designed to build the specialist knowledge and skills you need to enhance your employability and tackle the challenges facing our world today.

Our degrees are delivered with sustainability at their core, to give you the best grounding for the careers of the future. There are common themes and ideas that underpin our master's courses, which we have illustrated throughout this brochure. Look out for the following across our courses:

- A ENERGY CAREERS:** our master's courses equip you with first-class analytical skills that prepare you for careers in a world that is working through the energy transition.
- B BUILDING SUSTAINABLE FUTURES CAREERS:** securing existing infrastructures and planning for future sustainable developments are key aspects of our postgraduate courses.
- C LEADING CHANGE CAREERS:** a changing world requires new leadership, and our master's courses develop you as decision-makers and forward-thinkers.
- D INNOVATING TECHNOLOGY CAREERS:** as global priorities evolve, so do technological solutions. Our master's degrees train you in the most current technology and encourage innovations for our future.
- E RESEARCH FOR NEW HORIZONS:** our master's courses can lead you to further study with postgraduate research programmes (PhDs) where you will investigate solutions and methods for future science and engineering practitioners.

## CAREERS SERVICE

As a postgraduate student you may already have a career path in mind, but we'll do all we can to help you get there. We'll give you the opportunities to develop your skills and networks, and support tailored to your needs.

[Our first-class Careers Service](#) offers support and advice throughout your time at The University of Manchester, to help you make the most of your time here and best prepare you for your future. From CV and application advice to employer workshops and our job platform Career Connect, the Careers Service for students and graduates can help to put you in the best position to secure employment and act as a launchpad for your long-term career aspirations.

# SUSTAINABILITY

## LEADING THE WORLD ON SUSTAINABLE DEVELOPMENT

The quality and scale of our research, when compared against the UN's Sustainable Development Goals (SDGs), has been ranked in the top ten globally by the [Times Higher Education University Impact Rankings in 2022](#).

The [17 SDGs](#) are the world's call to action on the most pressing challenges and opportunities facing humanity and the natural world, and we are playing a leading role in tackling them.

As one of the world's leading research institutions, as well as being the only university in the UK to have social responsibility as a core goal, The University of Manchester is proactively tackling the SDGs in four ways – through our research, learning and students, public engagement activities and responsible campus operations.

Our [2021/22 SDG report](#) outlines how we are tackling the SDGs.



## OUR MASTER'S COURSES CONNECT WITH THE FOLLOWING UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

-  Goal 9: Industry, innovation and infrastructure
-  Goal 12: Responsible consumption and production
-  Goal 15: Life on land

# FACILITIES AND RESOURCES

## THE FUTURE OF LEARNING IN MANCHESTER

Our Home for Engineering and Materials is transforming the way our students study, research, and shape the world forever. Now, more than ever, is the time to study at The University of Manchester.

At the heart of the building's design is a desire to bring together all disciplines, in one connected and dynamic environment. The space supports a variety of teaching and learning styles, through blended lecture theatres, multi-purpose study spaces and over 250 state-of-the-art laboratories. There is also a range of technical spaces to help encourage students to shape their own learning environment.

We want our facilities to show ambition as well as recognise the real-world challenges that students will face in addressing some of the most pressing issues of our time. Our Home for Engineering and Materials boasts some of the most unique, industry-leading equipment and instrumentation in the sector to meet today's requirements and those of the future.

[Explore Our Home for Engineering and Materials.](#)



# MSC POLYMER MATERIALS SCIENCE & ENGINEERING

[Read more about this course](#)

Gain a rich understanding of the chemistry, properties, processing, characterisation and application of polymers with this multidisciplinary course. A wide range of polymers are considered, including commodity, speciality and those with applications in biomedicine, composites, nanotechnology and electronics. Be at the cutting-edge of polymer research, including the latest materials and techniques, with the opportunity to conduct research in world-leading research groups and facilities.

The polymer materials science and engineering course has a strong focus on research from the start. You will be taught by specialists from a range of disciplines, including chemistry, physics, composites, nanomaterials and processing.

The complete MSc is made up of taught course units and a research dissertation. The taught course units are delivered through a combination of lectures and practical laboratory work.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**D INNOVATING TECHNOLOGY CAREERS**

**E RESEARCH FOR NEW HORIZONS**

## WHERE DO OUR GRADUATES WORK?

- The University of Manchester
- Saudi Food & Drug Authority
- UBS Investment Bank
- Nestlé
- Applied Graphene Materials
- BASF

## WHAT DO OUR GRADUATES DO?

- Sales Engineer
- Technical engineer
- Quantitative Analyst
- Polymer Researcher
- Senior researcher
- Postdoctoral researcher
- Polymer chemist



### **COURSES IN RELATED SUBJECT AREAS:**

MSc Chemistry; MSc Materials; MSc Advanced Chemical Engineering; MSc by Research Physics; MSc Advanced Engineering Materials; MSc Biomaterials; MSc Advanced Manufacturing Technology & Systems Management

### **UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:**

The MSc in Polymer Materials Science and Engineering demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking.

### **ENTRY REQUIREMENTS AND PREREQUISITES:**

You will need a UK 2.2 Honours degree or overseas equivalent in the following backgrounds: Materials Science, Chemistry, Chemical Engineering, Physical Chemistry, Polymer Engineering, Composite Materials and Engineering, Biofunctional Materials, Metallurgy and Macromolecular Materials and Engineering. We can consider Biomaterials, Material Physics and other backgrounds on a case-by-case basis.

IELTS: at least 6.5 overall with no sub-test below 6.0.



**This course is accredited by the Institute of Minerals, Materials and Mining (IOM 3) as meeting the Further Learning requirements for registration as a Chartered Engineer.**



# MSC ADVANCED ENGINEERING MATERIALS

[Read more about this course](#)

This master's course provides you with an in-depth understanding of the key factors that govern the design and selection of materials for use in advanced engineering applications, as well as their processing, properties and stability.

Focusing on composites, advanced alloys and engineering ceramics, you will explore the technologies used in the manufacturing and processing of advanced materials and develop an understanding of the relationships between composition, microstructure, processing and performance. During this course you will:

- Develop your skills and knowledge in materials selection and design.
- Gain in-depth understanding of key factors shaping the design and selection of materials used in advanced engineering applications, their processing, properties and stability.
- Develop valued research, team working, data analysis and communication skills.
- Study at a university ranked 4th in the UK and among the top 30 in the world for Materials Science (QS World University Rankings 2022).

This course aimed at students who have a strong materials background. It is also suitable for graduates from other engineering and science backgrounds who wish to specialise in materials engineering.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**D INNOVATING TECHNOLOGY CAREERS**

**E RESEARCH FOR NEW HORIZONS**

*"The masters experience at UoM helped me gain a good breadth of knowledge around my area of interest that first helped me get into the aerospace industry. The application based teaching in some courses helped prepare me in solving real world engineering problems through materials solutions. Also, having experiential learning opportunities through the student union helped hone my communication and leadership skills."*

Arush Sinhal  
MSc Advanced Engineering Materials graduate  
Now working as a Consultant for BAE Systems



## COURSES IN RELATED SUBJECT AREAS:

MSc Mechanical Engineering Design; MSc Biomaterials; MSc Nanomaterials; MSc Corrosion Control Engineering; MSc Management of Projects; MSc Chemistry



### WHERE DO OUR GRADUATES WORK?

- Saudi Aramco
- Wadi Al Faraei trading & construction
- Arconic
- Research Centre for Physics, Indonesian Inst of Sciences
- BAE Systems

### WHAT DO OUR GRADUATES DO?

- Postdoctoral Researcher
- Materials Engineer
- Project Manager
- Chip test designer
- Composite Manufacturing Engineer

### UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

The MSc in Advanced Engineering Materials demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking .

### ENTRY REQUIREMENTS AND PREREQUISITES:

The standard entry requirement for this course is a UK 2.2 Honours degree or overseas equivalent in Materials Science, Mechanical Engineering, Physics, Metallurgical Engineering, Biomaterials or a related subject. A first degree in Chemistry with a 2.1 classification is also accepted. Other backgrounds may also be considered.

IELTS: at least 6.5 overall with no sub-test below 6.0.



This course accredited by the [Institute of Materials, Minerals and Mining \(IoM3\)](#) with the award of Further Learning.

# MSc BIOMATERIALS

[Read more about this course](#)

The MSc in Biomaterials provides you with thorough training in current clinically used biomaterials and state-of-the-art advances in these in research. You will gain knowledge and skills in the areas of specific materials design and testing for clinical application.

In the clinical application module, you will cover generations of biomaterials in orthopaedics and cardiovascular. In addition, you will be introduced to foreign body reactions to these materials. You will also be trained on advanced biomaterials including nanomaterials, natural materials, and soft matter. Further, you will explore techniques associated with translation of research from lab to clinic. Additionally, there will be a five-month long project component that will give you hands-on training on development and testing of novel biomaterials.

If you are looking for a career in cutting edge academic research or in industry as a biomaterial scientist, this could be the course for you.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**E RESEARCH FOR NEW HORIZONS**

## WHERE DO OUR GRADUATES WORK?

- The University of Manchester
- Institut Teknologi Sepuluh Nopember Surabaya
- Independent Vascular Services Ltd
- King Mongkut's Institute of Technology Ladkrabang
- NHS Blood and Transplant

*"My degree heavily emphasised the importance of creating novel solutions for healthcare problems. While being taught about historical and present day approaches, we were always encouraged to produce something new and play our part in shaping the future."*

Aiswarya Kishor

MSc Biomaterials Science and Tissue Engineering graduate  
Now working as Associate at L.E.K. Consulting



## COURSES IN RELATED SUBJECT AREAS:

MSc Chemistry; MSc Advanced Chemical Engineering; MSc Advanced Engineering Materials; MSc Advanced Manufacturing Technology & Systems Management

## WHAT DO OUR GRADUATES DO?

- Technical Entrepreneur
- Researcher and analyst
- Esthetic Dentist
- Instructor, Department of Chemistry
- Cell Culture Scientist

## UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

The MSc in Biomaterials demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking.

## ENTRY REQUIREMENTS AND PREREQUISITES:

You will need at least a UK 2.2 Honours degree or overseas equivalent in an engineering, physical or biological sciences or mathematical subject (i.e., Materials Science, Mechanical and Chemical Engineering, Biomaterials, Biomedical Sciences, Bioengineering or Chemistry etc). We can consider Nutrition, Health Sciences and other backgrounds on a case-by-case basis

IELTS: at least 6.5 overall with no sub-test below 6.0.



This course is accredited by the [Institute of Minerals, Materials and Mining \(IOM 3\)](#) as meeting the Further Learning requirements for registration as a Chartered Engineer.



# MSC CORROSION CONTROL ENGINEERING

[Read more about this course](#)

The MSc in Corrosion Control Engineering provides a thorough training in corrosion and its control. The course covers fundamental chemistry, physics, electrochemistry and metallurgy underpinning corrosion processes. Explore protection strategies and industrial applications for corrosion control engineering.

This course offers direct access to the knowledge, skills and expertise of leading academics in the field of corrosion. You will learn the fundamentals of corrosion, receiving expert insight into cutting-edge corrosion engineering problems and solutions in their specialist fields. Latterly, you will work closely with one of our academics, becoming an active member of their research group during your dissertation project.

Upon graduation from this course, you will be competently trained to work in UK, European or overseas industries as corrosion scientists or engineers.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**D INNOVATING TECHNOLOGY CAREERS**

**E RESEARCH FOR NEW HORIZONS**

### WHERE DO OUR GRADUATES WORK?

- Wood Group Kenny
- Petroleum Development Oman
- Shell
- Oceaneering

### WHAT DO OUR GRADUATES DO?

- Corrosion Engineer
- Project Manager
- Research Engineer
- Engineering Services Manager
- System Specialist

*"The MSc course helped me in gaining both theoretical and practical skills in corrosion science. In addition, the MSc course contributed in further increasing my industrial experience in internal and external corrosion protection, specifically in coatings systems."*

Shadha Al Toqi  
MSc Corrosion Control Engineering graduate  
Now working as a Corrosion Control Engineer



### **COURSES IN RELATED SUBJECT AREAS:**

MSc Subsurface Energy Engineering; MSc Chemistry; MSc Advanced Chemical Engineering; MSc Advanced Engineering Materials; MSc Advanced Manufacturing Technology & Systems Management



### **UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:**

The MSc in Corrosion Control Engineering demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking.

### **ENTRY REQUIREMENTS AND PREREQUISITES:**

You will need at least a UK 2.2 Honours degree or overseas equivalent in Materials Science, Physics, Metallurgical Engineering and Chemistry, Chemical Engineering (Other subjects in a Science, Engineering or Technology field will be considered, but a UK 2.1 Honours degree is needed). Professional experience can be taken into consideration on a case-by-case basis.

IELTS: at least 6.5 overall with no sub-test below 6.0.



This course is accredited by the [Institute of Materials Minerals and Mining \(IoM3\)](#).

# MSC NANOMATERIALS

[Read more about this course](#)

This exciting one-year masters provides research-focused teaching and training for graduates wishing to develop a career in the cutting-edge, dynamic field of nano and functional materials.

Gain an in-depth understanding of the principles governing nano and functional materials properties and synthesis, their characterisation and their assembly into advanced functional devices, from photovoltaics to supercapacitors.

You will cover a wide range of themes from advanced composites to graphene and functional nano materials. You will also gain hands-on advanced research training.

You will learn the principles governing nano and functional materials properties and synthesis, their characterisation and their assembly into advanced functional devices, from photovoltaics to supercapacitors. Gain advanced knowledge and training in state-of-the-art nano and functional materials and devices with a focus on low-dimensional materials, from 0D quantum dots to graphene and related 2D materials.

Explore scale-dependant properties of materials and their link to functionality and applications. Learn about strategies for nanomaterials assembly in 3D and nanocomposite fabrication with a view on their advantages and limitations. Plus, discover the potential socio-economic and environmental impacts of nanomaterials as a disruptive technology.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**D INNOVATING TECHNOLOGY CAREERS**

**E RESEARCH FOR NEW HORIZONS**

## WHERE DO OUR GRADUATES WORK?

- Nexperia
- VoltaChem
- Nanomedicine Lab 2.0
- The University of Manchester
- Pantherna Therapeutics GmbH

## WHAT DO OUR GRADUATES DO?

- Research
- Education
- Engineering
- Military and Protective Services
- Program and Project Management



### **COURSES IN RELATED SUBJECT AREAS:**

MSc Chemistry; MSc Advanced Chemical Engineering; MSc Advanced Engineering Materials; MSc by Research: Physics; MSc Advanced Manufacturing Technology & Systems Management; MSc Biomaterials.

This course aims to prepare graduates to become academic or industrial scientists with unique skills and expertise in nano and functional materials and related technologies.

### **UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:**

The MSc in Nanomaterials demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking.

### **ENTRY REQUIREMENTS AND PREREQUISITES:**

You will need at least a UK 2.2 Honours degree or overseas equivalent in Materials Science, Chemistry, Mechanical Engineering, Chemical Engineering, Nanoscience or Nanotechnology. Alternatively, a UK 2.1 Honours degree or equivalent is required in Physics, Mathematics, Civil Engineering, Electrical/Electronic Engineering or Biochemical Engineering.

IELTS: at least 6.5 overall with no sub-test below 6.0.



**This course is accredited by the Institute of Materials Minerals and Mining (IoM3) leading to Chartered Engineer (CEng) status.**



# MSc TEXTILE TECHNOLOGY (TECHNICAL TEXTILES)

[Read more about this course](#)

Develop a high level of understanding of modern textiles to prepare yourself for an academic career or a career in the textile or related industries as a manager or researcher.

The MSc course comprises taught course units and a research dissertation. Your taught course units will be delivered through a combination of lectures and practical laboratory work.

## Aims

- Expand your knowledge and understanding of the whole process of converting fibrous materials into textile end products;
- Develop your ability to identify and analyse the appropriate material and production route for a specific end product;
- Gain expertise and skills to conduct quality evaluation of textile products.
- Enhance your skills in problem solving, project management and independent research.

## THIS COURSE COULD LEAD YOU TO A CAREER IN ONE OF THE FOLLOWING CATEGORIES:

**B BUILDING SUSTAINABLE FUTURES CAREERS**

**E RESEARCH FOR NEW HORIZONS**

## WHERE DO OUR GRADUATES WORK?

- Saudi Standards, Metrology and Quality Org. (SASO)
- Vaibhav Laxmi Group
- Arvind Dyeing and Bleaching Mills
- Center Of Excellence For Composites, Atira
- Selfridges

*"Firstly, my MSc in Textile Technology, equipped me to attain distinction in my PhD in Polymer Engineering, at Universiti Teknologi Malaysia, and propelled me to be awarded the best PhD in Polymer Engineering, at the 57th Convention ceremony held by UTM in 2016. Secondly, my solid training in my MSc here at UoM propelled me to be ranked in the global Top 2 % Scientist by Stanford University in December, 2021, ranked 12th out of best 100 scholars at Unizik (2021), and 92nd out of the best top 500 SCIVAL Authors in Nigeria (2017) by ELSEVIER INC.USA. My Manchester experience was fantastic and leads the pathway I follow to global scientific success."*



Engr. Dr. Christopher Igwe Idumah. MSc Textile Technology graduate  
Now working as a Lecturer for the Faculty of Engineering, Department of Polymer and Textile Engineering, Nnamdi Azikiwe University, Nigeria.

## COURSES IN RELATED SUBJECT AREAS:

MSc Management of Projects; MSc Biomaterials; MSc Polymer Materials Science and Engineering



## WHAT DO OUR GRADUATES DO?

- Technical Officer
- Chemical Engineer
- Director Of Business Development
- Research Associate
- Director of Textile Department

## UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

The MSc in Textile Technology (Technical Textiles) demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking.

## ENTRY REQUIREMENTS AND PREREQUISITES:

You will need a UK lower-class (2.2) Honours degree in a Science, Engineering or Technology field, or equivalent international degree.

IELTS: at least 6.5 overall with no sub-test below 6.0.



This course is accredited by the [Institute of Materials Minerals and Mining \(IoM3\)](#) leading to Chartered Engineer (CEng) status.

# PRACTICALITIES

## PRACTICALITIES - FEES, FUNDING, AND SCHOLARSHIPS

Your master's fees will cover the cost of your study at the University as well as charges for registration, tuition, supervision, examinations, and graduation. Tuition fees also entitle you to membership of our libraries, the Students' Union, and the Athletic Union.

If you require funding for your master's course, it is advised that you begin looking as soon as possible. A range of funding options may be available to you, which will differ depending on whether you are a student from the UK or an international student (including the EU).

Check the tuition fees for your chosen course, your fee status, and funding opportunities by visiting our [master's fees and funding webpage](#).





## ACCOMMODATION

For most of you, Manchester won't just be your next stage of education; it'll be your new home for a year or more. From the moment you arrive, you'll be able to access support to help you make the most of your time in university accommodation. You'll find a range of accommodation options for postgraduate students, from contemporary and traditional halls of residence to a specialist advice service for those interested in private letting.

An offer of residence in university accommodation is guaranteed to all overseas postgraduate students for the duration of their studies, provided they meet conditions related to offer holder status and study mode. If your application falls outside the conditions of the guarantee, you are still welcome to apply for university accommodation.

Find out more on the [accommodation website](#) or explore our [interactive map](#).

This brochure was created in 2022/2023. It has therefore been created in advance of course starting dates and for this reason, course information may be amended prior to you applying for a place. There are a number of reasons why changes to course information and/or published term dates may need to be made prior to you applying for a place – more details can be found on our website. Prospective students are therefore reminded that they are responsible for ensuring, prior to applying to study, that they review up-to-date course information by searching for the relevant course at: [manchester.ac.uk/study/masters/courses/](http://manchester.ac.uk/study/masters/courses/)

Further information describing the teaching, examination, assessment, and other educational services offered by The University of Manchester is available at: [manchester.ac.uk/study/masters/](http://manchester.ac.uk/study/masters/)

Royal Charter Number RC000797

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-  [materials.manchester.ac.uk/](http://materials.manchester.ac.uk/)
-  [@UoMMaterials](https://twitter.com/UoMMaterials)
-  [@UoMMatSE](https://www.instagram.com/UoMMatSE)
-  [Materials at Manchester](https://www.youtube.com/channel/UC...)
-  [mub.eps.manchester.ac.uk/uommaterialsblog/](http://mub.eps.manchester.ac.uk/uommaterialsblog/)

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