MANCHESTER 1824

The University of Manchester

EARTH AND ENVIRONMENTAL SCIENCES

POSTGRADUATE COURSES

SHAPE YOUR FUTURE

Learn today, lead tomorrow

CONTENTS

SHAPE YOUR FUTURE: CAREERS

Our Department is ranked sixth in the UK for the quality of our research.
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, 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 7: Affordable and clean energy
- Goal 13: Climate action
- Goal 14: Life below water
- Goal 15: Life on land

FACILITIES AND RESOURCES

EARTH AND ENVIRONMENTAL SCIENCES

We are one of the largest earth and environmental science departments in the UK, with a vibrant community of staff, student and researchers. Our range of MSc progammes are designed to equip graduates to succeed in the workplace or further advanced research.

Many of our facilities are housed in the Williamson Research Centre, which acts as a hub for interdisciplinary research in molecular environmental science. The Centre houses a range of research laboratories and equipment for investigating our environment and the effect of human behaviour on environmental systems. These include the Manchester Analytical Geochemistry Unit, the Mineral Analysis Facility and molecular environmental science facilities.

We have advanced computing suites with access to all leading industry standard software and machine learning techniques, including the Manchester Air Quality Monitoring Supersite.

Discover more about our facilities online.

MSC PETROLEUM GEOSCIENCE

Read more about this course

Study at the interface of geoscience, engineering and geophysics, while developing all the skills you need to develop the sustainable hydrocarbon resources that will underpin our successful transition to a new economic model.

We will build your knowledge by examining the processes that govern the way sedimentary basins fill, and how an understanding of these complex three-dimensional systems can be usefully applied to improve models of petroleum systems in the subsurface.

Develop the key skills required to evaluate subsurface geology and use industry-standard software with real industry data sets.

The knowledge and techniques taught at Manchester are also directly applicable to developing subsurface technologies in geothermal energy, carbon capture and storage and network gas storage.

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

A ENERGY CAREERS **B BUILDING SUSTAINABLE FUTURES CAREERS**

WHERE DO OUR GRADUATES WORK?

- Equinor
- Shell
- CGG
- Exxon
- Schlumberger

WHAT DO OUR GRADUATES DO?

- Geoscientist;
- Geologist and Exploration Geologist;
- Energy Consultant;
- Data Engineer.

The MSc in Petroleum Geoscience prepared and shaped my skills well for my responsibilities in my current company, I am using both the soft and technical skills learned in the MSc on a daily basis."

Abdullah Waleed Al Kandari
MSc Petroleum Geoscience graduate.
Now working as a Geologist in Exploration Group in Kuwait Oil Company.

COURSES IN RELATED SUBJECT AREAS:

MSc Renewable Energy and Clean Technology; MSc Geoscience for Sustainable Energy; MSc Subsurface Energy Engineering

ENTRY REQUIREMENTS AND PREREQUISITES:

An upper second-class degree (or overseas equivalent) in Geology, Geophysics, Petroleum Engineering, or related discipline.

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

This course is accredited by the Geological Society of London

MSC GEOSCIENCE FOR SUSTAINABLE ENERGY

Read more about this course

Join the next-generation of geoscientists and equip yourself with the skills needed to ensure the long-term, sustainable supply and storage of low-carbon energy in line with global net zero targets.

Our mission is to provide you with the technical knowledge and skills required to work in interdisciplinary careers that ensure the sustainable supply of energy and technology deployed to reduce atmospheric carbon by:

- supplying energy from the subsurface
- storing energy in the subsurface
- long-term atmospheric carbon storage
- storing waste from energy streams

This education and training will be facilitated by the integration of fundamental theoretical knowledge, laboratory, and industry-standard computational tools through blended learning, tutorials, seminars, field trips, and group work.

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

A ENERGY CAREERS
B BUILDING SUSTAINABLE FUTURES CAREERS
E RESEARCH FOR NEW HORIZONS

WHERE DO OUR GRADUATES WORK?

Students that have graduated from our energy geoscience master's courses have gained employment in national and international integrated energy companies globally, as well as gone on to undertake further PhD study.

"My PhD focuses on subsurface CO2 storage which is now seen as critical to reaching our global climate targets. My work identifies potential subsurface storage sites, using software and workflows I was introduced to during the MSc... I developed a skill set, knowledge, and network that I use every day in my PhD, and these have helped me towards employment in the energy sector.

Chris Lloyd
MSc Geoscience graduate
Now doing his PhD on Carbon Capture and Storage

OTHER RELATED COURSES:

MSc Renewable Energy and Clean Technology; MSc Petroleum Geoscience for Reservoir Development and Production; MSc Subsurface Energy Engineering

UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

The MSc Geoscience in Sustainable Energy demonstrates Manchester's commitment to sustainability, echoed in our 2022 top 10 Times Higher Education Impact Ranking. This course has been developed to prepare graduates to deliver on the demands of the energy transition and ensure a sustainable supply of low carbon energy.

ENTRY REQUIREMENTS AND PREREQUISITES:

An upper second-class degree or equivalent in Geology, Geophysics, Petroleum Engineering or related discipline.

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

MSC POLLUTION & ENVIRONMENTAL CONTROL

Read more about this course

This course is the longest-established environment and pollution related MSc in the UK. You will gain knowledge and understanding in this subject area as well as a strong grounding in the quantitative and qualitative skills required to manage pollution and address environmental questions.

By studying this course, you will improve the value of your first degree to employers in the environmental sector – designing, carrying out, and reporting an independent project is particularly important. Our alumni, who have gone on to become environmental professionals in science and industry, agree that this course has been a springboard to both start and advance careers in the sector for the last 35 years.

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

B BUILDING SUSTAINABLE FUTURES CAREERS
E RESEARCH FOR NEW HORIZONS

WHAT DO OUR GRADUATES DO?

- Environmental Consultant;
- Managing Directors;
- Environmental Scientist;
- Professors, Researchers and Academics.

WHERE DO OUR GRADUATES WORK?

- Environment Agency
- United Utilities
- Jacobs
- AECOM
- ENVIROS

"I am currently an ESG Research Associate in MSCI. My MSc has helped my career by opening up more opportunities whether through the competitive edge it has given to my CV or through colleagues I have met."

Carissa Quintana (MESPOM)
MSc Pollution and Environmental Control graduate
Now working as an ESG Research Associate in MSCI.

OTHER RELATED COURSES:

MSc Renewable Energy and Clean Technology; MSc Geoscience for Sustainable Energy; MSc Subsurface Energy Engineering

UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

Pollution and Environmental Control's study provision prepares students for a career in environmental management or resource conservation. Students explore the social, economic, and engineering elements of environmental protection for both water and land-based ecosystems.

ENTRY REQUIREMENTS AND PREREQUISITES:

An upper second-class bachelor's degree (or overseas equivalent) in a natural science, environmental science, environmental engineering, water science engineering, or other related scientific or technological discipline from a recognised university.

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

MSC SUBSURFACE ENERGY ENGINEERING

Read more about this course

This course is jointly developed with the Department of Chemical Engineering

It is expected that two-thirds of the global energy to be covered by renewable sources by 2050. However, the transition away from fossil fuels requires an integrated approach, utilising existing energy sources and developing new technologies that both decarbonise and provide new sources of energy.

Geosystems play a critical role in this process, offering sources of both fossil fuels (oil and gas) and renewable energy (e.g. geothermal energy) alongside capacity for decarbonisation through geological CO2 sequestration.

Our MSc Subsurface Energy Engineering will give a unique opportunity to students - with a prior qualification in engineering - to learn engineering and modelling skills required to understand these systems.

Focus on the modelling and simulation of subsurface properties, processes in industrial applications to assist with the transition to a cleaner energy system; carbon capture and storage; geothermal energy; groundwater resources and ground mechanics and stability.

OTHER RELATED COURSES:

MSc Renewable Energy and Clean Technology; MSc Geoscience for Sustainable Energy; MSc Petroleum Geoscience

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

A ENERGY CAREERS
B BUILDING SUSTAINABLE FUTURES CAREERS
D INNOVATING TECHNOLOGY CAREERS
E RESEARCH FOR NEW HORIZONS

WHERE DO OUR GRADUATES WORK?

- Shell
- BP
- TOTAL
- Jacobs
- Aspen Tech

WHAT DO OUR GRADUATES DO?

Students will acquire a deep and systematic conceptual understanding and practical engineering skills needed for diverse industrial applications such as reservoir engineering, geothermal engineering, and carbon sequestration. Additionally, the course offers unique opportunities to talented students to work with industry during their MSc research project.

UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

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

The MSc additionally offers a Subsurface Physical Chemical Process taught unit and research projects related to industrial applications required for future sustainable energy (e.g. geological carbon storage, hydrogen storage, geothermal energy).

ENTRY REQUIREMENTS AND PREREQUISITES:

Upper second (2.1) class honours degree (or overseas equivalent) in engineering subjects (chemical, civil, mechanical, petroleum engineering), or in geological sciences (geology, geophysics, petroleum geology, petrophysics, hydrogeology) with an evident background in engineering mathematics. Relevant industrial experience may also be considered alongside a previous degree.

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

MSC DATA SCIENCE (ENVIRONMENTAL ANALYTICS)

Read more about this course

This course is jointly developed with the School of Social Sciences.

MSc Data Science (Environmental Analytics) is hosted by the School of Social Sciences with academic teaching delivered by Earth and Environmental Sciences.

Mapped to The University of Manchester's research strengths, the aim of this pathway is to prepare you for new and exciting training across cutting-edge data science and environmental science technologies. Integrate multiple complex data sources and create tools that enable informed decision-making for future environmental systems.

Train in the emerging research area of 'Environmental Intelligence' and help contribute to the understanding of complex interactions between the environment, climate, natural ecosystems, human social and economic systems, and health.

The global demand for data scientist talent continues to grow, as a result, our course qualification will provide a strong boost to your employability.

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

- **A** ENERGY CAREERS
- **B** BUILDING SUSTAINABLE FUTURES CAREERS
- **C** LEADING CHANGE CAREERS
- **D** INNOVATING TECHNOLOGY CAREERS
- **E** RESEARCH FOR NEW HORIZONS

WHERE DO OUR GRADUATES WORK?

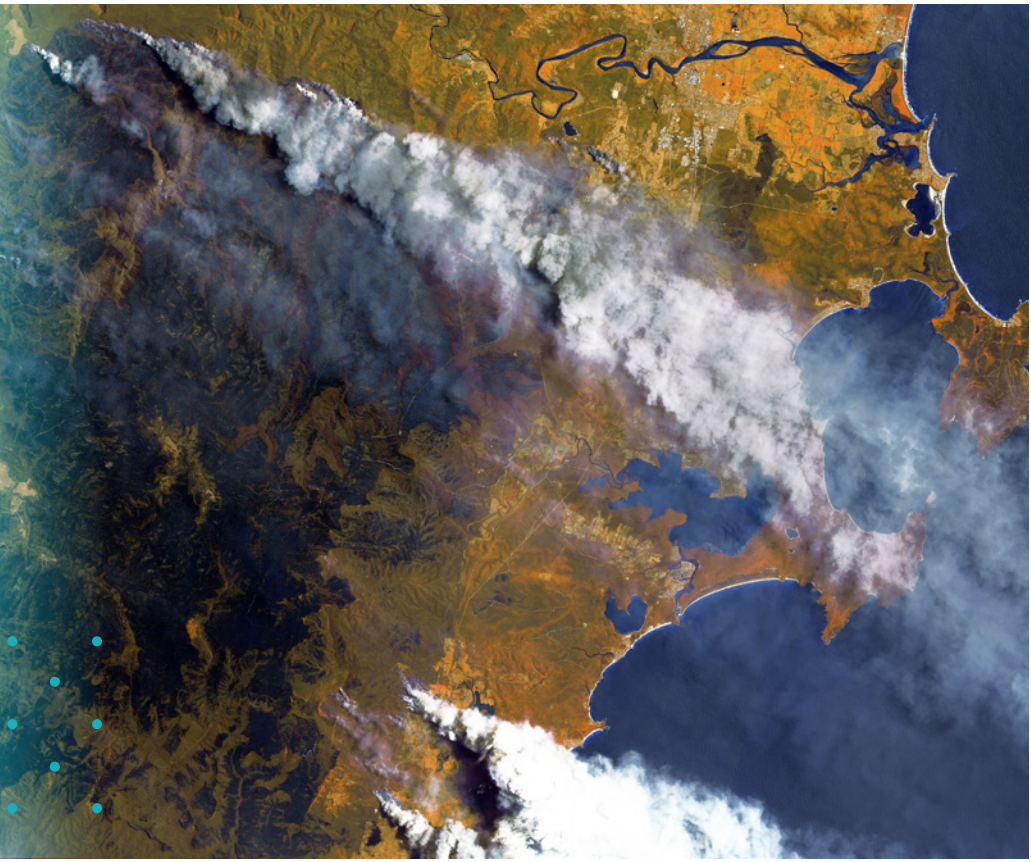
- Further study;
- The commercial research sector;
- Academia;
- Charities;
- Central and local government.

UNITED NATIONS SUSTAINABILITY DEVELOPMENT GOALS:

The quality and scale of our impact against the UN's Sustainable Development Goals (SDGs) has been ranked top ten in the world in the Times Higher Education University Impact Rankings in 2022.

COURSES IN RELATED SUBJECT AREAS:

MSc Renewable Energy and Clean Technology; MSc Petroleum Geoscience; MSc Subsurface Energy Engineering; MSc Geoscience for Sustainable Energy



ENTRY REQUIREMENTS AND PREREQUISITES:

High 2:1 honours degree (or overseas equivalent) in degrees such as Environmental Science, Atmospheric Science, Geography, Computer Science, Physics, Chemistry and Maths.

You should demonstrate aptitude, knowledge and/or interest in three areas: data analytics and/or statistics; computational subjects; and pathway specific requirements.

IELTS: Academic test score of 7 overall with no component score below 6.5

ACADEMICS AND THEIR RESEARCH

DAVID TOPPING,
PROFESSOR OF THE DIGITAL ENVIRONMENT; DEPT OF EARTH AND ENVIRONMENTAL SCIENCES

David's research focuses on the use of digital technologies to better understand the impacts we have on our environment; covering numerical models of atmospheric processes to the use of artificial intelligence and data from multiple domains. Air pollution and climate change are two key socio-environmental drivers that represent some of the biggest multidisciplinary challenges in science, society and the economy today. The need to understand the chemical and physical processes in the atmosphere has created a wide range of experimental platforms over the past two decades. In response, Davids's research covers development and application of numerical models, and data science methodologies, to tackle this complexity and inform new ways of working.

The increasing amount of data collected on the environment and how we conduct our lives has the potential to dramatically transform policy design and implementation, particularly in the field of air quality. The size of the global datasphere is predicted to double less than every two years. Each day, thousands of monitoring stations around the world gather vast quantities of data on air quality of varying veracity and detail. New, data-driven platforms – utilising near real-time data – offer a tremendous opportunity to predict quantified impacts of proposed policy interventions and thus determine interventions with the greatest outcomes on public health, the environment, and the economy. As we move towards a net-zero society, we must ensure we avoid unintended consequences of change. For this, we need data-driven tools and a robust evidence base on which to inform short to long-term decisions.

WHAT OUR STUDENTS SAY

"I took a module which was essentially teaching us how to be an earth and environmental consultant. This has been a huge help in my current job as some things really do just pop up and are required urgently, so I'm really glad I had that skill before I started the job!"

Amelia Tobin
MSc Pollution and Environmental graduate
Now working as Environmental Specialist at AWE.

"Pollution and Environmental Control - I think the title is self-explanatory for choosing this course in the present environmental context. I am from Dhaka, Bangladesh, one of the most polluted cities of the world. The course units were designed in a cohesive way to empower graduates to deal with environmental issues in the real world. The unit on the basics of conducting research was also helpful for me when carrying out my individual research project."

Nazmoon Nahar Sumiya
MSc Pollution and Environmental Control graduate
Now working as a Lecturer at Department of Geography and Environment, University of Dhaka, Bangladesh

"Petroleum engineering and Dr Vahid Niasar ignited my interest in reservoir engineering, it is a fascinating field where one is constantly catching up to nature. I took on the PhD under his supervision, my life's best decision. Petroleum engineering and a PhD in multiphase flow in porous media has given me a solid understanding of the fundamental principles in reservoir engineering."

Rimsha Aziz
BEng Petroleum Engineering graduate and PhD in multiphase flow in porous media
Now working as a Production Optimisation Reservoir Engineer

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/

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/

Royal Charter Number RC000797

pgt.earth.sci@manchester.ac.uk
ees.manchester.ac.uk/
@UoMEEScience
@UoM_EES
@uom_ees
Earth and Environmental Sciences Manchester
mub.eps.manchester.ac.uk/sees/

The University of Manchester
Department of Earth and Environmental Sciences
Williamson Building
Oxford Road
Manchester
M13 9PL
United Kingdom

Tel: +44 (0) 161 543 4022