Academic year
2025/26 entry

Cranfield University

Postgraduate master's courses in

Science and engineering for sustainability

within Agrifood, Energy and Sustainability, Environment, and Water

- Advanced Chemical Engineering MSc
- Advanced Mechanical Engineering MSc
- Environmental Engineering MSc
- Renewable Energy MSc
- Soil Scientist Apprenticeship with Soil Science MSc
- Water and Wastewater Processes MSc

Cranfield University

Our reputation

We are the UK's only specialist postgraduate university in technology and management, with longstanding relationships with some of the most prestigious global companies. Our close collaboration with industry, and passion for the areas we operate in, will help your career.

Specialist postgraduate

A research-focused professional community.

We work with over

1,500

businesses and governments based in over **40 countries.**

Over £150m

of investment in new facilities over the past five years.

5,000+

postgraduate students from 100+ countries.

A network of

80,000+

alumni, from 173+ countries.

As we are postgraduate only, we are not listed in many league tables that help compare undergraduate universities.

Sustainable engineering and science at Cranfield

With a global reputation, Cranfield University is at the forefront of research and education.

winner Queen's Anniversary Prize

Cranfield is a six-time winner of the prestigious **Queen's Anniversary Prize**, the only national honour given to educational institutions for work carried out in the public interest.

Top 30

in the world

for Engineering – Mechanical, Aeronautical and Manufacturing

QS World University Rankings by subject, 2023

Reasons to **study with us**

1

Research-informed and industry-relevant

Our courses are designed with employers and careers in mind. An industrial advisory panel reviews our course material on a regular basis to ensure that content remains relevant to industry needs and our internationally-recognised research places you at the forefront of new techniques and innovations, providing you with an opportunity to make an immediate impact.

2

Learning from the best

Taught by academic staff from all around the world as well as industry practitioners, Cranfield attracts leaders globally. The diverse mix of backgrounds, cultures, knowledge and experiences creates a rich teaching and research environment to tackle the grand challenges facing the world.

3

Outstanding facilities

Our extensive and impressive on-site pilot-scale facilities enable our students to conduct exciting, transformative and leading science.

Our energy facilities include gas turbines, high-pressure combustion rigs, a flow assurance laboratory, solar simulators, wind tunnels and a 30m wave tank. The Crop Health and Protection (CHAP) centre, soil health and agri-technology facilities feature within our agrifood and environment facilities. And our water facilities boast dedicated laboratories for clean water, fermentation, microbiology, wastewater and water chemistry and the National Research Facility for Water and Wastewater Treatment.

4

Projects with impact

As a specialist postgraduate university, we have excellent links with industry, giving you the opportunity to collaborate with both large and medium-sized companies. Industry-sponsored group and individual projects enable you to apply the technical knowledge you've gained during the modules, to combat major global challenges facing the sector now and in the future.

5

Flexible learning

The majority of our MSc courses run on a full- and part-time basis. For part-time students, the modular structure allows flexibility, making an MSc achievable even if you work full-time.

"I think renewable energy is a really promising field, it's exciting to be working in. So many countries are trying to meet their climate targets and that means everybody is turning their heads to renewable energy technology."

Abdulaziz Alkhalid, (Renewable Energy MSc 2023)

Courses

For over 40 years, Cranfield has been leading the development and implementation of methods for analysing and managing environmental resources. Our work is making an impact across many sectors, by applying an integrated approach to combat the challenges we face in the 21st century.

We are proud to be teaching the next generation of scientists, engineers and managers. Our world-leading research within the energy, environment, agrifood and water sectors, combined with our collaboration with leading industry specialists and access to the latest technologies and informatics tools, provide you with an applied learning experience that will enable you to make an immediate impact on your career.

Compulsory modules are listed in the order they are delivered. Elective modules are listed alphabetically.

The compulsory and (where applicable) elective modules offered in the 2024-25 academic year, are shown to give you an idea of course content. To keep our courses relevant and up-to-date, modules are subject to change so please check the latest information on our website.

Solar farm, Cranfield campus

Advanced Chemical Engineering

www.cranfield.ac.uk/advancedchemicalengineering	Full-time, Part-time	MSc, PgDip, PgCert

This MSc is suitable for all engineering and applied science graduates, who want a successful career as a chemical engineering professional in industry, government or research.

You will study alongside world-leading chemical engineering experts who are actively engaged in researching and developing the innovative materials and processes essential for net zero energy transition and making a positive impact to climate change.

Compulsory modules

- Research Methods,
- Separation and Purification Design,
- Advanced Reaction Kinetics for Energy,
- Biofuels and Biorefining,
- Energy from Waste Operations,
- Engineering Design and Project Management.

Elective modules

- Process Instrumentation and Control Engineering,
- Thermal Systems Operation and Design.

Accredited by: energy institute Accredited Course

Advanced Mechanical Engineering

www.cranfield.ac.uk/ame	Full-time, Part-time	MSc, PgDip, PgCert

Mechanical engineers are in huge demand across the energy sector. This course provides real-world, industrially-focused teaching to enhance career prospects.

You will learn state-of-the-art mechanical engineering methods, apply them to real-world problems via industrially-focused modules and research projects, whilst gaining the essential management skills to bring your ideas to life.

This course has been designed to provide you with engineering skills and experience which are transferable to the sector of your choice, including energy, aerospace, automotive or manufacturing.

Compulsory modules

- Principles of Engineering,
- Structural Integrity,
- Assessing Risk and Failure,
- Engineering Stress Analysis: Theory and Simulations,
- Fluid Mechanics and Loading,
- Computational Fluid Dynamics for Renewable Energy,
- Engineering Design and Project Management.

Elective modules

- Component Design,
- Design of Offshore Energy Structures.

Accredited by: energy institute Accredited Course; Institution of MECHANICAL ENGINEERS

Environmental Engineering

www.cranfield.ac.uk/environmentalengineering	Full-time, Part-time	MSc, PgDip, PgCert

This environmental engineering course is designed for science, engineering, and geography graduates who are passionate about the protection and improvement of environmental quality alongside enhancing the quality of human life.

You will learn principles of environmental improvements, including the protection of environmental quality at both local, landscape and global scales.

Compulsory modules

- Principles of Engineering,
- Pollution Prevention and Remediation Technologies,
- Health, Safety and Environmental Risk,
- Modelling Environmental Processes,
- Sustainable Environmental Solutions.

Elective modules select one

- Air Quality Measurements and Management,
- Biofuels and Biorefining,
- Waste Management in a Circular Economy: Reuse, Recycle, Recover and Dispose.

Elective modules select one

- Energy Systems Case Studies,
- Environmental Water Quality,
- Land Engineering Principles and Practices.

Elective modules select one

- Catchment Management,
- Energy from Waste Operations,
- Resource Recovery for Water and Wastewater.

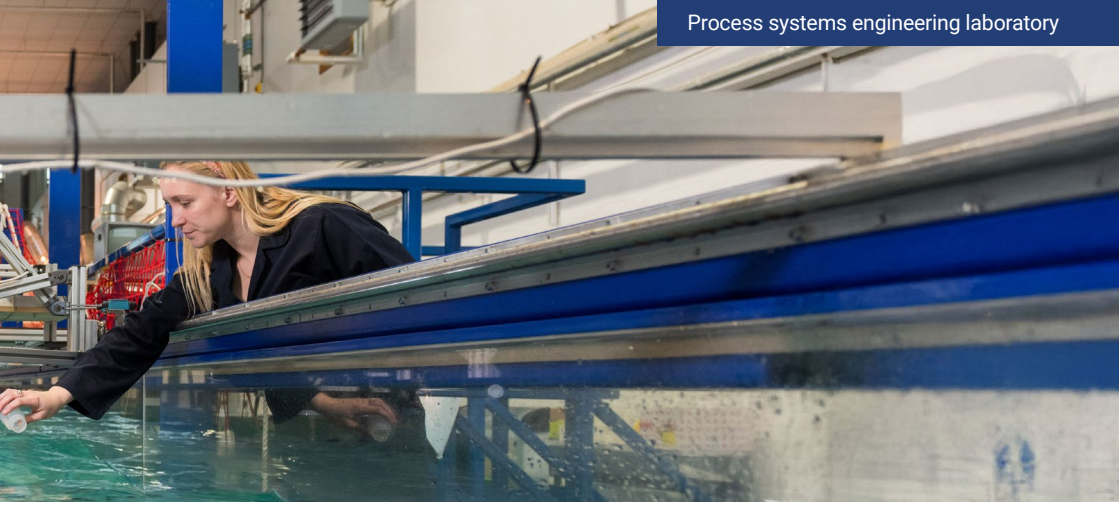
Attendance only module

- Engineering Design and Project Management.

Accredited by.

CIWEM Chartered Institution of Water and Environmental Management
Accredited Course

IAgrE



Renewable Energy

www.cranfield.ac.uk/re	Full-time, Part-time	MSc, PgDip, PgCert

This MSc will equip you with the advanced knowledge and skills to develop a successful career in the rapidly growing renewable energy sector. A choice of study routes enables you to specialise in developing the latest technical skills required to design renewable energy systems, or to focus on managing renewable engineering projects and systems.

Cranfield offers unique engineering-scale facilities for the development of efficient renewable energy technologies with low CO_2 emissions and a teaching team with extensive experience of solving real-world renewable energy challenges.

There are two study routes available on this course: management or engineering.

Engineering route compulsory modules

- Renewable Energy Technologies 1,
- Renewable Energy Technologies 2,
- Solar Energy Engineering,
- Engineering Stress Analysis: Theory and Simulations,
- Fluid Mechanics and Loading,
- Design of Offshore Energy Structures,
- Energy Entrepreneurship.

Management route compulsory modules

- Renewable Energy Technologies 1,
- Renewable Energy Technologies 2,
- Health, Safety and Environmental Risk,
- Energy Economics and Policy,
- Sustainability and Environmental Assessment,
- Energy Entrepreneurship,
- Engineering.

Both routes must choose one elective module

- Energy Systems Case Studies,
- Short Research Project.

Accredited by: energy institute Accredited Course; Institution of MECHANICAL ENGINEERS

Soil Science

www.cranfield.ac.uk/soilscience	Online, Part-time	MSc

Co-designed by UK industry, this course will equip and upskill you with the knowledge, understanding, tools, practices, and resources to achieve optimal soil management.

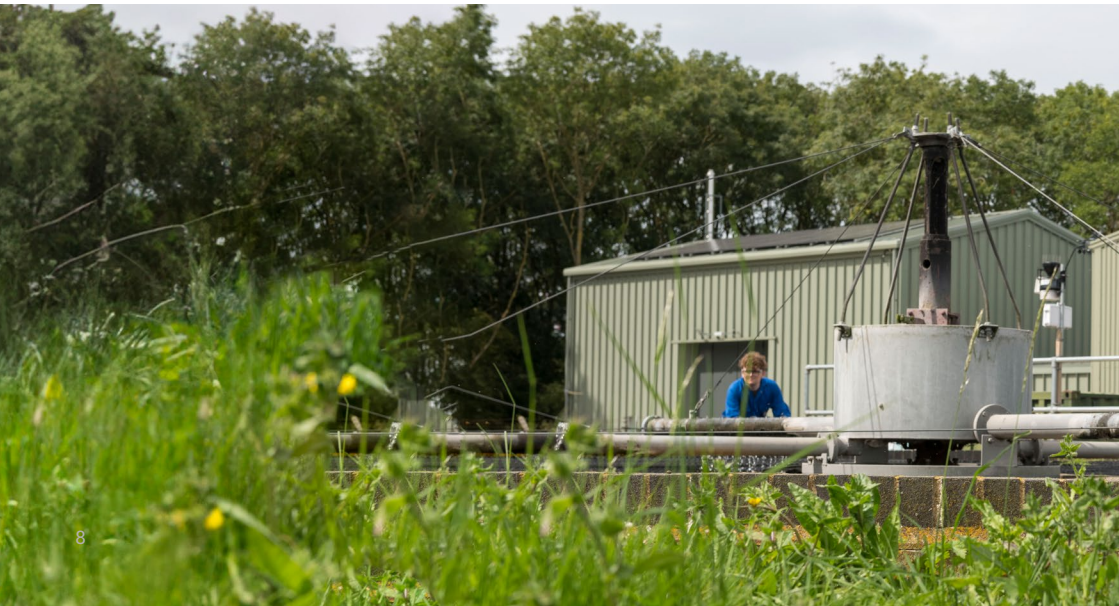
Compulsory modules

- Project Management and Portfolio,
- Introduction to Soils,
- Soils and Policy,
- Desk-based Soil Assessments and Basic Statistics,
- Soil Surveying,
- Field-based Methods for Rural Soils,
- Fundamental Laboratory Methods in Soil Science,
- Soils - a Nexus,
- Soil Mapping, Modelling and GIS,
- Advanced Data Analysis and Statistics,
- Field-based Methods for Urban Soils,
- Advanced Laboratory Methods in Soil Science,
- Sustainable and Resilient Land Management.

Soil Scientist Apprenticeship

Our Soil Scientist master's-level apprenticeship, is delivered against the Soil Science L7 Standard. Apprenticeships provide a unique opportunity to blend academic studies with real-time work-based activity, supporting both individual and business development. Funding for eligible applicants employed and based in England can be allocated from the employer Apprentice Levy account.

Read more on our website: www.cranfield.ac.uk/soilscientistapprenticeship



Water and Wastewater Processes

www.cranfield.ac.uk/waterandwasteprocesses	Full-time, Part-time	MSc, PgDip, PgCert

This MSc is designed as a truly interdisciplinary course to equip you with the necessary skills to become the innovators, specialists, and knowledge integrators of tomorrow who will design, lead, and deliver transformative solutions and change agendas.

There are two study routes available on this course: engineering or environmental science.

On both routes, you will be supported and guided by academic staff who are world-leading experts in their field and whose cutting-edge research directly informs our teaching to help us go beyond standard textbooks. Throughout the course you will cover theory, application and practice while working in our world-class facilities.

Engineering route compulsory modules

- Global Water Sector,
- Water and Wastewater Treatment Principles,
- Process Science for the Water Sector,
- Water and Wastewater Treatment Processes,
- Advanced Water and Wastewater Treatment Processes,
- Hydraulics and Pumping principles for Water and Wastewater,
- Risk and Asset Management for Water and Wastewater.

Environmental Science route compulsory modules

- Global Water Sector,
- Water and Wastewater Treatment Principles,
- Process Science for the Water Sector,
- Water and Wastewater Treatment Processes,
- Advanced Water and Wastewater Treatment Processes,
- Catchment and Climate Change,
- Environmental Water Quality.

Both routes must choose one elective module

- Nature-based Solutions for Water and Wastewater,
- Resource Recovery for Water and Wastewater.

National research facility for water and wastewater treatment

Course **structure**

Our specialist, sector-focused master's courses are set up and developed in close collaboration with industry partners, ensuring the content of our courses remains industry-relevant and employers are impressed with our graduates' business-readiness.

This diagram illustrates the standard course structure for our master's programmes. Please check your course structure online for more detailed information.

Taught programme

An intensive learning experience providing the knowledge you need to excel in your specialist field.

Group project

The ability to understand how your part of a project affects the whole, giving you **a head start for the world of work.**

Individual project

An opportunity to think and work in an original way. For example, this could be working on a project for a university partner, delving deeper into an area of specific interest or a real-world challenge in the sector you want to work in.

Group projects

Some recent projects include:

- Fatigue life assessment of offshore wind turbine bolted connections.
- CO_2 and H_2 as feedstock for the chemical industry.
- Future innovations in agricultural and environmental engineering.
- Development of a novel floating solar farm in waves, in the UK for Douglas Bomford Trust.
- Using multi-criteria decision analysis to evaluate the choices and trade-offs implicit with potential futures for Research England and Oxford-Cambridge Arc local partners.
- Assessing alternative processes for upgrading wastewater treatment plants for Severn Trent Water.
- Designing nature-based solutions for combine sewer overflow (CSO) treatment.

Industry **links**

Cranfield has unrivalled links with industry, and you will benefit from our extensive contacts and track record of close collaboration with decision-makers in your chosen sector.

These benefits range from the various high-profile guest speakers we are able to attract, to the ability to network with future employers at our group presentation days and careers fairs held on campus.

Industrial advisory panel

Our courses are reviewed each year by a panel of industry advisers from leading companies and institutions in the sector. This ensures that the skills you acquire are up-to-date and what employers want.

Careers

Our alumni can be found around the world in leading roles. Here are a few examples of the roles our alumni have secured in recent years.

Read more on our website **www.cranfield.ac.uk/careers**

Roles:

- Chemical Engineer,
- Civil Engineer,
- Design Engineer,
- Environmental Consultant,
- Head of Water Quality,
- Lead Completions Engineer,
- Renewable Energy Analyst,
- Senior Project Engineer,
- Wind Farm Developer.

Companies:

- BP,
- Deloitte,
- EDF,
- Environment Agency,
- GE Renewable Energy,
- Rolls-Royce Marine AS,
- Severn Trent Water,
- Scottish Power,
- Scottish Water,
- Syngenta,
- Thames Water.

Academic **staff**

You will be taught by a wide range of subject specialists at Cranfield and from industry, who draw on their research and industrial expertise to provide stimulating and relevant input to your learning experience.

The list of academics below represents a small proportion of our staff; we also have a large number of highly-experienced guest lecturers.

Professor Ronald Corstanje,
Professor of Environmental Data Science and Head of Cranfield Environment Centre

www.cranfield.ac.uk/rcorstanje

Ron specialises in the development and application of data analytics to develop a better understanding in the nature and behaviour of natural systems and processes so to inform nature recovery, climate adaptation and mitigation strategies.

Professor Paul Jeffrey,
Professor of Water Management

www.cranfield.ac.uk/pjjeffrey

Paul's research interests span a range of disciplines and topics related to the delivery of sustainable water use. He has led projects on water reuse, the social and economic dimensions of water management, and resilient water systems.

Dr Ali Nabavi,
Interim Head of Centre for Renewable and Low Carbon Energy

www.cranfield.ac.uk/anabavi

Ali's research focuses on applying the fundamentals of multiphase, thermofluid, and reactive transport processes to gas sorption, separation, and conversion for carbon capture, utilisation, and storage (CCUS) as well as low-carbon fuel production. This includes material development, novel concept prototyping, technology assessment, and computational modelling.

Professor Jane Rickson,
Professor of Soil Erosion and Conservation

www.cranfield.ac.uk/jrickson

Jane has over 35 years of experience in soil and water engineering, specialising in soil degradation processes and sustainable land management. Her work focuses on understanding soil functions and their role in delivering ecosystems goods and services.

Professor Ana Soares,
Professor of Biotechnology Engineering

www.cranfield.ac.uk/asoares

Ana is an International Water Association (IWA) Fellow and leads the Resource Recovery Community of Practice. Her research is applied in municipal as well as industrial wastewater. Her scientific findings have resulted in leading-edge processes and technological innovations that contribute, worldwide, to sustainable solutions for effluent treatment.

Dr Joy Sumner,
Head of Centre for Energy Engineering

www.cranfield.ac.uk/jsumner

Joy is a metallurgist, investigating the many ways materials start to degrade within energy systems. These studies are carried out with industry experience she brings to her teaching activities. She completed her studies at Cambridge and MIT and engages with a wide range of professional networks.

Professor Angel Medina Vaya,
Director of Environment, Agrifood and Water.

www.cranfield.ac.uk/amedinavaya

Angel's research focuses on the impact that environmental stress has on the functioning of fungi,the mechanisms used for ecophysiological tolerance, and the molecular basis of secondary metabolite production, especially mycotoxins.

Professor Upul Wijayantha,
Head of Hydrogen Integration Research Centre

www.cranfield.ac.uk/wijayantha

Upul has 30 years of experience in academic and industrial settings in developing low-carbon energy technologies. He has a strong track-record in successfully delivering large strategic projects, helping organisations as an expert advisor (e.g. International Energy Agency, Offshore Renewable Energy Catapult and working as a champion in green energy transition.

Key facts and statistics

Course information

Full-time
One year.

Part-time
Two to three years. See the course page for more information about part-time study.

Start date
Various. Please visit course pages for more information.

Award
MSc/PgDip/PgCert.
Not all courses offer all awards, see course information on pages 4 and 5 for details of awards offered.

Fees
Please see the individual course pages on our website for full fee information and full-time or part-time options. Terms and conditions apply. See **www.cranfield.ac.uk/fees**

Cohort profile*

Geographic spread
31% UK.
69% International.

Average cohort age
20–39.

Average cohort size
25.

Gender
74% Male.
26% Female.

*These figures give an indication of the course make-up at registration across our sustainable engineering and science courses for the entry 2023-2024.

"I fell in love with the course due to the course content, excellent staff, world-class facilities for water and the industrial field trips. Knowing that the water programme was highly sought after and considering it's employability benefits in the UK and other countries convinced me to choose Cranfield"

Francis Sankah, current student, (Water and Wastewater Processes MSc)

Useful **information**

Financing your studies

Whether you are a UK-based or international student, we provide information, advice and a range of online tools to help you put together the funding package you need. Take a look at our funding finder which provides a searchable database of sources of financial support. We also offer bursaries for high quality applicants. Visit our website where we provide a range of additional sources of potential funding and helpful organisations and contacts for information, advice and guidance.

Learn more at **www.cranfield.ac.uk/funding**

More than a degree with the **Cranfield Enhance programme**

Cranfield graduates are valued for their distinctive skills and capabilities. We have developed these programmes to complement and enhance what you learn on your chosen qualification. On the Cranfield Enhance programme, you will be able to earn 'digital badges' in areas such as employability and entrepreneurship to showcase your new skills to prospective employers.

Read more at **www.cranfield.ac.uk/enhance**

Kings Norton Library

Life at **Cranfield**

A welcoming, professional campus community.

Explore our University

You can personalise your virtual visit to our campus by choosing the subject area you are interested in on our interactive tool:

virtualexperience.cranfield.ac.uk

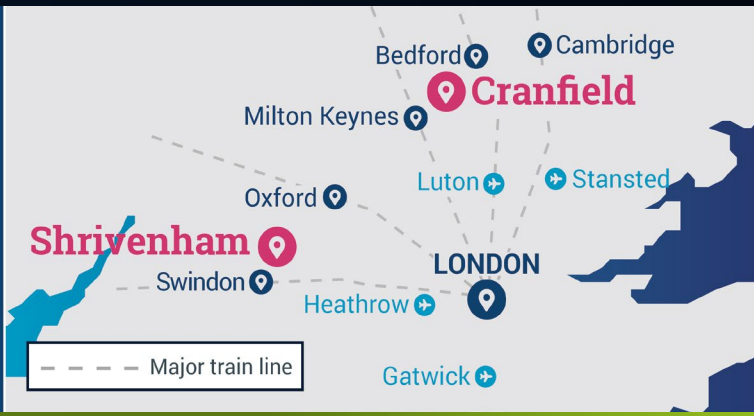
How to **apply**

Read more about our entry requirements and how to apply at **www.cranfield.ac.uk/apply**

Our **location**

Located just over an hour from London in the English countryside, Cranfield's campus environment supports close, working relationships between our multinational postgraduate students and academic and industry experts.

www.cranfield.ac.uk/visit



www.cranfield.ac.uk/studysustainability

Our sector study areas:

Aerospace,
Defence and Security,
Energy and Sustainability,
Environment and Agrifood,
School of Management,
Manufacturing and Materials,
Transport Systems,
Water.

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blogs.cranfield.ac.uk

For a full list of Cranfield courses, please see our **prospectus** and website.

Cranfield University,
Cranfield, MK43 0AL, UK

T: +44 (0)1234 758082
E: study@cranfield.ac.uk
www.cranfield.ac.uk

Every effort is made to ensure that the information in this brochure is correct at the time it is printed. Please check our website for the latest information. SWEE-SES-November 2024.