



Cranfield
Energy and
Power



Postgraduate
master's courses in

Energy and Power

Academic year 2022/23 entry

Advanced Chemical Engineering MSc
Advanced Digital Energy Systems MSc
Advanced Heat Engineering MSc
Advanced Mechanical Engineering MSc
Advanced Process Engineering MSc
Offshore Engineering MSc
Renewable Energy MSc

Cranfield University

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

81%

of our research is world-leading or internationally excellent

Research Excellence Framework (REF) 2014



THE QUEEN'S ANNIVERSARY PRIZES FOR HIGHER AND FURTHER EDUCATION 2019

Over **£150 million** of investment in new facilities over the past five years

Six-time winner of the Queen's Anniversary Prize for Higher and Further Education

A professional network of **70,000+** alumni, from 177 countries

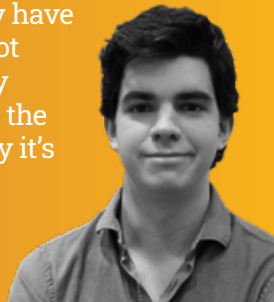
5,000+ postgraduate students from 100+ countries

UK Top 5 for Engineering (Mechanical, Aeronautical and Manufacturing) QS World University Rankings by subject, 2021

As we are postgraduate only, we are not listed in league tables that help compare undergraduate universities, such as *The Times World Rankings* and *The Complete University Guide*.

"I chose Cranfield for its heritage, the technology they have developed over the years is impressive and I have a lot of friends that have studied here so they gave a pretty good recommendation. Cranfield is also very good in the rankings. In my field specifically in renewable energy it's very well positioned."

Xavier Lebrija, Edison Engineer, GE Renewable Energy (Renewable Energy MSc 2019)



Reasons to study **Energy and Power** with us

1 **Projects with industry**

We work closely with industry to tackle the real-world issues in both developed and developing nations, and address global climate challenges around carbon reduction, renewable energy and the transition to sustainable energy and net-zero. Your individual and group project will give you an opportunity to work with our industry connections and make a difference to the energy landscape of tomorrow.

you the opportunity to build useful, and career-enhancing connections with industry. You will have instant access to our international alumni network and build long-term relationships with the Cranfield academic team to last throughout your career.

2 **Learning from the best academics**

We attract leaders in their area of expertise from around the globe. The diverse mix of backgrounds, cultures, knowledge and experiences creates a rich teaching and research environment to tackle the grand challenges facing the world, and deal with climate change head-on.

5 **Research-informed teaching**

Our teaching is informed by our expertise in all forms of energy and power across technology and business. This includes renewable energy, thermal and carbon capture and storage, energy from waste, energy materials and power plants, energy policy and strategy, the exciting and rapidly growing area of digital energy systems and so much more. The team at Cranfield incorporate their latest ground breaking knowledge into each year's MSc courses to ensure that the course content gives you the opportunity to make an immediate impact.

3 **Outstanding facilities**

Our extensive and impressive on-site pilot-scale facilities allow us to conduct exciting, transformative and leading science. These facilities include: gas turbines, high-pressure combustion rigs, a flow assurance laboratory, a high-temperature coating test facility, solar simulators, wind tunnels, large scale mechanical test rigs and a 30m wave tank, amongst others.

6 **Industry-relevant courses**

We design our courses with employers and careers in mind. We combine high-calibre teaching with practical, real-world work experience, giving you an unparalleled competitive edge and the ability to start on your journey the moment you leave Cranfield.

4 **Networking opportunities**

We have a considerable global network of industrial and government contacts, some of whom will provide regular or guest lectures, which gives

7 **Flexible learning**

All energy and power 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.

Courses

Modules form 40% of the course content, with the group and individual projects making up the other 60%.

The list of modules for each course is available on our website.

Advanced Chemical Engineering

MSc/PgDip/PgCert

www.cranfield.ac.uk/ace • Accredited – see page 9

The MSc in Advanced Chemical Engineering will equip you with the skills to address the global chemical engineering challenges of the 21st century.

Advanced Digital Energy Systems

MSc/PgDip/PgCert

www.cranfield.ac.uk/ades

Digital technology is set to change the face of energy. This course provides the skills, techniques and know-how to be part of this exciting and fast growing sector.

Advanced Heat Engineering

MSc/PgDip/PgCert

www.cranfield.ac.uk/ahc • Accredited – see page 9

Advance your career and change the world, by working to reduce or eliminate one of the major causes of carbon emissions globally.

Advanced Mechanical Engineering

MSc/PgDip/PgCert

www.cranfield.ac.uk/ame • Accredited – see page 9

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



Advanced Process Engineering

MSc/PgDip/PgCert

www.cranfield.ac.uk/ape • Accredited – see page 9

Learn how to design, optimise and operate industrial processes, as well as lead engineering projects and begin your transformation into an engineering leader solving global challenges.

Offshore Engineering

MSc/PgDip/PgCert

www.cranfield.ac.uk/oe • Accredited – see page 9

Whether you are interested in offshore renewable energy or traditional offshore oil and gas engineering, if you want to help develop stable, secure and financially viable solutions to the fundamental energy challenges affecting society in the 21st century then this is the course for you. This course offers two study routes: i) management ii) engineering.

Renewable Energy

MSc/PgDip/PgCert

www.cranfield.ac.uk/re • Accredited – see page 9

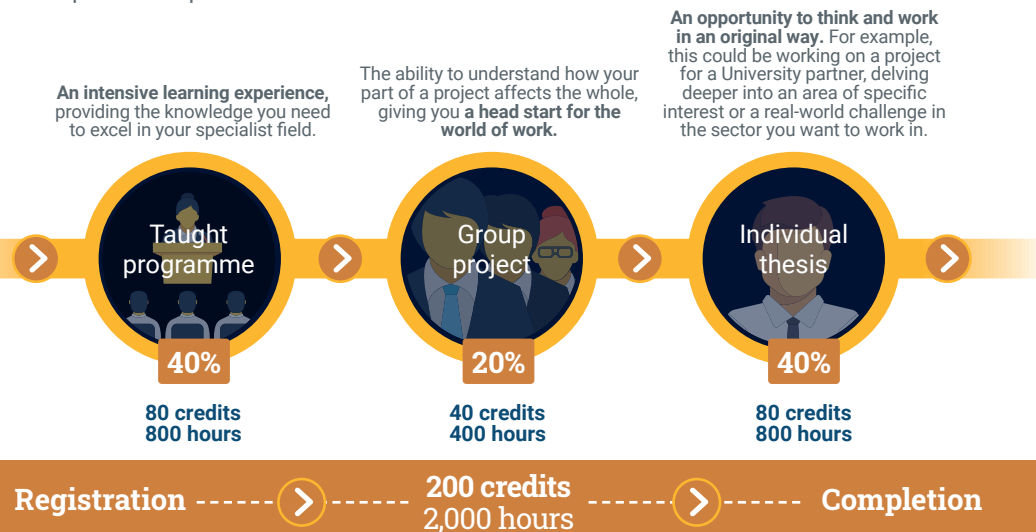
The Renewable Energy MSc will equip you with the advanced knowledge and skills to develop a successful career in the rapidly growing renewable energy sector. Two study routes are available on this course: i) management ii) engineering.

The Energy and Power MSc course modules are predominantly delivered over two weeks. The first week will typically involve lectures and workshops, with the second week largely dedicated to assignments and tutorial sessions. The modules delivered before the Christmas break are designed to provide you with the essential learning and more theoretical elements of your course. Whilst the modules delivered throughout January and February provide you with the opportunity to apply this knowledge in practical and case study-based modules.

Course structure

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

This diagram illustrates the course structure of our full-time master's courses. Please check your course structure online for more detailed information, including the weight of each phase and part-time course structure variations.



Careers

An exciting and rewarding career within energy awaits you. Whatever your specialism there are numerous opportunities to shape your career and begin making a significant change to society.

You could soon join our graduates and alumni around the globe, who are already initiating change within the energy sector in roles and at organisations such as:

Roles:

- Edison Engineer,
- Operations Engineer,
- Principal Process Engineer,
- Renewable Energy Analyst,
- Senior Project Engineer,
- Wind Farm Developer.

Organisations:

- EDF,
- GE Renewable Energy,
- L'Oréal S.A.,
- Rolls-Royce Marine AS,
- Shell Petroleum ,
- Siemens.

Industry links

Cranfield has unrivalled links with industry. You will benefit from our extensive contacts and track record of close collaboration with government and the energy and power sector. These links include industrial advisory panels and project sponsors.

Companies and organisations we work and collaborate with to research and develop sustainable energy and power technologies across the sector include: UK Power Networks, SEMLEP, Carbon Trust, Cadent, Intecsea, Saudi Aramco, MBNL, BP and many more.

Industrial advisory panel

Our courses are reviewed each year by a panel of industry advisors from leading companies and institutions in the sector. This ensures that the skills you acquire are up-to-date and are what employers want. Some of the companies represented on our energy and power industrial advisory panel include:



SIEMENS

Industry-sponsored group projects

Cranfield's group project experience provides you with the opportunity to take responsibility for a consultancy-type project while working under academic supervision. Below are some recent examples:

- Fatigue life assessment of offshore wind turbine bolted connections,
- Peer to peer energy trading with battery electric vehicles,
- CO2 and H2 as feedstock for the chemical industry,
- Parametric investigation and optimisation of a novel ocean-going robotic platform,
- Modelling oil spill response under fast current,
- Modelling conditions in representative gas,
- Turbine environments,
- Design specification and engineering development of a cold thermal energy system,
- Working towards a green airport through electrification.

Academic staff

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



Professor Phil Hart, Director of Energy and Power

Phil has held a series of senior roles within the energy and power sector in the UK, Asia and North America throughout his career. Phil has worked with governments and industry, securing technology development funding from, among others, Department of Energy (USA), Shell, BP, Huawei and Petrobras.

www.cranfield.ac.uk/prhart



Dr Gill Drew, Director of the Energy and Power MSc Programme

Gill is responsible for overseeing and managing the delivery of the MSc courses in Energy and Power. Gill's research focusses on climate change adaptation and the impacts of waste and energy on the environment.

www.cranfield.ac.uk/ghdrew



Professor Phil Longhurst, Head of Climate and Environmental Protection Centre

Phil leads a team of academics with research programmes into reducing green house gas emissions, resource loss, energy recovery from waste and pollution reduction. His research includes working with the design and manufacturing, waste management, bioenergy energy and regulation sectors.

www.cranfield.ac.uk/pjlonghurst



Dr Nazmiye Ozkan, Head of Energy Systems and Strategy Centre

Nazmiye is an interdisciplinary energy economist with a background in urban and regional planning, she is interested in understanding the interactions between social, economic, environmental and technological systems, from household up to network and city level.

www.cranfield.ac.uk/nozkan



Professor Chris Sansom, Head of Renewable Energy Systems Centre

Chris has over thirty years' experience in industry and teaching, and spearheads UK research on Concentrating Solar Power (CSP). Current research includes solar thermal technologies, materials and applications, thermal energy storage and thermal energy harvesting.

www.cranfield.ac.uk/csansom



Professor Nigel Simms, Head of Thermal Energy Systems and Materials Centre

Nigel has wide-ranging experience of the performance of components and materials in advanced power generation systems, as well as experience in the design and development of large laboratory-scale test rigs and pilot plants for investigating materials performance in realistic industrial conditions.

www.cranfield.ac.uk/njsimms

Key facts and statistics

Course information



Full-time
One year



Part-time
Up to three years



Start date
October



MSc/PgDip/PgCert



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/fee-information

Cohort profile*



Geographic spread
28% UK
24% EU
48% Rest of world



Typical cohort age
19-29 years



Average cohort size
Approximately 8



12% Female
88% Male

*These figures give an indication of the course make-up at registration across Energy and Power for the the entry year 2020-2021.

Accreditation

The following courses are accredited by the Institution of Mechanical Engineers: Advanced Heat Engineering MSc, Advanced Mechanical Engineering MSc, Advanced Process Engineering MSc, Offshore Engineering MSc and Renewable Energy MSc.

The following courses are accredited by the Energy Institute: Advanced Chemical Engineering MSc, Advanced Heat Engineering MSc, Advanced Mechanical Engineering MSc, Advanced Process Engineering MSc, Offshore Engineering MSc and Renewable Energy MSc.

Institution of
MECHANICAL
ENGINEERS

energy
institute
Accredited Course

Financing your studies

If you need advice on funding your course, we can provide information and a range of online tools to help you put together the funding package you need for your course and living costs.

There is more information on our website:

www.cranfield.ac.uk/funding

How to apply

Read more about our entry requirements and how to apply online on our website.

www.cranfield.ac.uk/apply



Life at Cranfield

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



Take a virtual tour to see inside some of our facilities:

virtualtour.cranfield.ac.uk

Cranfield University works with over

1,500 businesses and governments
based in over 40 countries

These organisations include:

AIRBUS

BAE SYSTEMS



LOCKHEED MARTIN

**Recycling
Technologies**



**UK
RI** UK Research
and Innovation



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

www.cranfield.ac.uk/energyandpower

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blogs.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. Photographs in this publication were taken prior to and during the coronavirus pandemic. We continue to monitor the pandemic and take all the necessary steps to ensure the health, safety and wellbeing of our Cranfield community.

See www.cranfield.ac.uk/coronavirus SWEE-EP-July 2021.