



Renewable Energy

MSc, PgDip, PgCert



Develop a successful career in renewable energy.

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 state-of-the-art technical skills required to design renewable energy systems, or to focus on managing renewable engineering projects and systems. Ranked in the UK top 5 for mechanical engineering, Cranfield offers a unique, postgraduate-only environment, unique engineering-scale facilities for the development of efficient renewable energy technologies with low CO2 emissions and a teaching team with extensive experience of solving real world renewable energy challenges.

Who is it for?

This course is designed for engineering, maths or science graduates who wish to develop a successful and rewarding career in the renewable energy sector. It will equip you with the multidisciplinary skills required to design, optimise and evaluate the technical and economic viability of renewable energy schemes. The engineering route will provide you with the state-of-the-art technical skills required to design renewable energy systems, including finite element analysis (FEA), computational fluid dynamics (CFD), and technology lifecycle management (TLM). Alternatively, you can specialise in managing renewable energy projects and systems; focusing on topics such as health and safety and environment; energy entrepreneurship and asset management.

Course structure

- Eight taught modules (40%),
- Group project or dissertation: (20%),
- Individual research project (40%).

Informed by industry

The Renewable Energy MSc is closely aligned with industry to ensure that you are fully prepared for your new career:

- Cranfield's long-standing strategic partnerships with prominent players in the energy sector ensures that the course content meets the needs of global employers in the renewable energy sector,
- The teaching team are heavily involved in industrially funded research and development, enabling you to benefit from real-world case studies throughout the course,

- An industrial advisory board for the programme scrutinises course content and ensures its relevance to the needs of global employers.

Future career

With the current worldwide focus on addressing low carbon energy production and renewable energy technologies, graduates of this course can expect to be highly sought after by employers. On successful completion of the course you will have the skills and knowledge to be able to analyse current and future energy needs, and design and implement appropriate solutions, taking into account the social, environmental, technical, regulatory and commercial issues.

You can expect to go on to a wide range of careers as professional scientists or engineers in energy production, distribution and demand management across the full breadth of industrial and public sector organisations.

Past graduates have gone on to roles in companies such as, E.On, Vestas, Siemens Gamesa Renewable Energy, ABB and EDF.

Key information

Duration:

MSc: one year full-time, two to three years part-time.
PgDip, PgCert: one year full-time, two years part-time.

Start date:

Full-time: October.
Part-time: October.

Qualification:

MSc, PgDip, PgCert.

Location:

Cranfield campus.

Entry requirements

A first or second class UK Honours degree (or equivalent) in a related science or engineering discipline. Other recognised professional qualifications or several years relevant industrial experience may be accepted as equivalent; subject to approval by the Course Director.

Overview of taught modules

Compulsory modules (both routes)

(all the modules in this list need to be taken as part of this course).

Energy Entrepreneurship

This will provide you with knowledge and skills relevant for starting and managing new ventures across the entrepreneurial life cycle. Moreover, it will prepare you on how to prepare a business pitch to an investor.

Energy Systems Case Studies

Using a relevant case study, the scientific and technical concepts learned during the previous modules will be brought together and used to execute the analysis of the case study.

Renewable Energy Technologies 1

The purpose of this module is to introduce the basis for assessment of the performances of solar, wind, wave and tidal, geothermal as well as hydro-electricity technologies. By the end of the module, you will have a better understanding of the various renewable technologies and will have the opportunity to visit a PV solar plant to see the real dimension of an operational plant.

Renewable Energy Technologies 2

This module provides detailed knowledge in energy storage, bioenergy, energy harvesting and energy distribution. This module also provides you with knowledge and experience in designing and analysing renewable energy infrastructures in power generation, energy storage, distribution and corresponding renewable energy applications.

Engineering route compulsory modules

Design of Offshore Energy Structures

This module provides you with the ability to critically evaluate the structural components of renewable energy devices operating in challenging environments, such as offshore wind turbines. Advanced computational methods are used to assess the environmental loads acting on these structural components and of the contemporary methodologies and engineering design tools used for the prediction of these loads.

Engineering Stress Analysis: Theory and Simulations

This module brings together theoretical and computational stress analysis through finite element simulations, allowing you to appreciate how the two disciplines interact in practice and what their strengths and limitations are.

Fluid Mechanics and Loading

This module aims to provide you with a theoretical and applied understanding of fluid mechanics and fluid loading on structures.

Solar Energy Engineering

You will be provided with detailed knowledge of solar energy generation systems, and their technical specifications. This module provides you with the knowledge and skills to design and critically evaluate solar energy generation systems.

Management route compulsory modules

Energy Economics and Policy

This module covers a variety of theoretical and empirical topics related to energy demand, energy supply, energy prices, renewable vs depletable resources and environmental consequences of energy consumption and production, all from an economic perspective.

Health, Safety, Sustainability and Environment

These four topics are broad and cover many aspects. This module is designed to provide you with the competencies to assess and evaluate the relevant international standards relating to these four topics, as well as the legislation and regulatory requirements.

Research Methods and Project Management

This module will provide you with experience of scoping and designing a research project. This requires a thorough understanding of the background literature, as well as qualitative and quantitative analysis techniques. The module provides sessions on project scoping and planning, including project risk management and resource allocation. A key part of this module is the consideration of ethics, professional conduct and the role of an engineer within the wider industry context.

Sustainability and Environmental Assessment

This module introduces you to the modern techniques for environmental assessment. It comprises several hands-on case studies that enable you to develop relevant competencies via hands-on experience.

Group project

The group project is an applied, multidisciplinary, team-based activity. Often solving real-world, industry-based problems, you and your fellow students will have the opportunity to take responsibility for a consultancy-type project while working under academic supervision. The group project is highly valued by employers for developing your ability to work within agreed objectives, deadlines and budgets, whilst developing transferable skills such as team work, self-reflection and effective communication.

Recent group projects include:

- Conversion of consumer waste plastic into new plastics,
- Design specification of pilot scale 142 kWth air/rock,
- Conceptual and preliminary design of a SPAR for a 5 MW VAWT.

Individual project

Selected in consultation with the Thesis Co-ordinator and Course Director, the individual project offers the opportunity for you to focus on an area of particular interest and of direct relevance to your career aspirations. It will enable you to develop independent research skills, to think and work in an original way, contribute to knowledge and overcome real-world problems – particularly as many of the projects are supported by external organisations.

Accreditation and Rankings

The MSc of this course is accredited by the Institution of Mechanical Engineers (IMechE) and The Energy Institute.



Cranfield ranks fifth in the UK for Engineering – Mechanical, Aeronautical & Manufacturing in the QS World Rankings 2021.



Contact details

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

For further information please visit
www.cranfield.ac.uk/re