Offshore engineering is a rapidly developing discipline. In addition to its traditional relevance to the oil & gas industry, it is expanding to embrace the novel engineering challenges presented by the offshore renewable energy industry. We have answered this expansion in scope by developing a new state-of-the-art MSc in Offshore Engineering, exploiting our strong track record in offshore renewable energy projects and giving our graduates the competitive edge in their career.

When you choose to study this course you can select whether to follow the engineering or management route. This ensures that the course is tailored to your background as well as your planned career path.

Who is it for?

This course is suitable for engineering, maths or science graduates who wish to specialise in Offshore Engineering. It develops professional engineers and scientists with the multidisciplinary skills and ability to analyse current and future offshore energy engineering problems.

Our MSc in Offshore Engineering is able to provide the new skills needed across this fast developing sector, together with the fundamental engineering understanding necessary, whatever the application. Exciting new disciplines taught in this MSc include Advanced Maintenance Engineering and Asset Management; Health, Safety, Security and Environment; Risk and Reliability Engineering; and Computational Fluid Dynamics for Industrial Processes.

When applying for this MSc you will be able to choose between two routes: one focusing on detailed engineering aspects, and the other focusing on offshore asset management. Graduates with an MSc in Offshore Engineering will be able to work in a range of different industries including offshore renewables, oil & gas, aquaculture systems and beyond.

Course structure

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

Informed by industry

Our world-class reputation for industrial-scale research facilities and pilot-scale demonstration programmes in the energy area, and close engagement with the energy sector over the last 20 years has produced long-standing strategic partnerships with these sectors’ most prominent players. Our strategic links with industry ensures that all of the material taught on your course is relevant, timely and meets the needs of organisations competing within the energy sector. This industry-led education makes our graduates some of the most desirable in the world for energy companies to recruit from.

Future career

On successful completion of this course you can expect to develop diverse and rewarding careers in the extremely exciting and challenging fields of offshore oil and gas exploration, underwater engineering, pipeline engineering, risk management in offshore and marine operations, and the emerging offshore renewable energy industry. The international nature of such activities means that career opportunities are not restricted to the domestic market; Cranfield graduates develop careers around the world.

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 in a relevant science, engineering or related discipline, or the international equivalent of these UK qualifications. Other relevant qualifications, together with significant experience, may be considered.
Overview of taught modules

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

Applied Materials and Corrosion
This module provides a knowledge and understanding of the corrosion processes that occur on structural materials and the impact on their mechanical performance.

Energy Systems Case Studies
You will be provided with a deep understanding of the truly multidisciplinary nature of a real industrial project. 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.

Management for Technology
This module covers the importance of technology leadership in driving the technical aspects of an organisation's products, innovation, programmes, operations, and strategy, especially in today's turbulent commercial environment with its unprecedented pace of technological development.

Materials and Corrosion
This module will enable you to understand the structure and properties of materials, their possible corrosion responses, and to apply this knowledge to specific applications.

Risk and Reliability Engineering
Risk and Reliability Engineering introduces the principles of risk and reliability engineering and associated tools and methods to solve relevant engineering problems in industry.

Engineer ing route compulsory modules

Computational Fluid Dynamics for Renewable Energy
The aim of this module is to introduce the Computational Fluid Dynamics (CFD) techniques and tools for modelling, simulating and analysing practical engineering problems related to renewable energy, with hands-on experience using commercial software packages used in industry.

Engineering Stress Analysis: Theory and Simulations
The examination of Finite Element Analysis (FEA) for various practical applications in conjunction with relevant case studies will allow you to combine theoretical understanding with practical experience.

Structural Integrity
This module provides an understanding of pertinent issues concerning the use of engineering materials and practical tools for solving structural integrity and structural fitness-for-service problems.

Management route compulsory modules

Advanced Maintenance Engineering and Asset Management
This module will provide the knowledge and skills necessary to design advanced maintenance, monitoring and asset management strategies for complex engineering systems through the lifecycle.

Energy Economics and Policy
This module covers a variety of topics related to energy demand, supply, prices, renewable vs depletable resources and environmental consequences of energy consumption and production. It will demonstrate how key economic principles are used in various energy-environment models to inform energy and climate policy.

Health, Safety, Security and the Environment
Within the scope of a single module, it is not possible to cover all 4 aspects in depth. The module is designed to provide you with the competencies to assess and evaluate the relevant international standards as well as the legislation and regulatory requirements. There is a strong focus on the use of case studies to provide examples of how standards and legislation are implemented in practice.

Group project
The group project is an applied, multidisciplinary, team-based activity. Often solving real-world, industry-based problems, you will be provided with the opportunity to take responsibility for a consultancy-type project while working under academic supervision. Success is dependent on the integration of various activities and working within agreed objectives, deadlines and budgets. Transferable skills such as teamwork, self-reflection, and clear communication are also developed.

Recent group projects include:
• Conceptual and preliminary design of a SPAR for a 5 MW VAWT
• Investigation of severe slugging in pipelines

Individual project
The individual project is the chance for you to focus on an area of particular interest to you and your future career. You can select the individual project in consultation with the Thesis Co-ordinator and your Course Director. These projects provide you with the opportunity to demonstrate your ability to carry out independent research; think and work in an original way; contribute to knowledge; and overcome genuine problems in the offshore industry. Many of the projects are supported by external organisations.

Accreditation and Rankings
This MSc degree is accredited by the Institution of Mechanical Engineers (IMechE)

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