Energy Informatics

MSc, PgDip, PgCert

Future energy supply has to be stable, secure, affordable and sustainable. Energy Informatics is an emerging discipline that utilises powerful tools from modern information technology to analyse data from different energy systems and sources to help solve energy supply challenges.

Developed economies now face a number of challenges in procuring energy security and responding to energy pricing and affordability issues, as well as dealing with contributions to carbon emission targets. Due to the growth of sustainable and renewable energy production, energy informatics plays a significant role in managing the world's growing energy demand. Both developed and developing countries are facing great challenges in improvements in energy efficiency, reductions of greenhouse gas emissions and enlargements of renewable energy applications. For example, the UK Government has set ambitious targets to decrease the greenhouse gas emissions to 80% of today's by 2050; the China Government has also planned to significantly reduce CO2 emissions to a level of 5,000 million tons in 2050, which is half of current emissions.

Through this course, you will develop professional informatics skills required in the growing energy sector, with essential abilities applicable in both the renewables industry (wind, geothermal and solar) and the traditional energy industry (oil and gas).

Who is it for?

This course is suitable for Computer Science, Mathematics, Engineering and Information Technology graduates, and practicing IT engineers wishing to pursue a technical management career in the strongly growing energy industry sector. It develops professional engineers and scientists with the multidisciplinary skills and ability to analyse current and future energy engineering problems.

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 and transport sectors over the last 20 years has produced long-standing strategic partnerships with the sectors most prominent players. The strategic links with industry ensures that all of the material taught on the 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.

Future career

Graduates from this course will develop diverse and rewarding careers in the extremely promising energy sector. The international nature of this growing field would allow Cranfield graduates to develop careers all over the world.

If you are pursuing further study through continued education (PhD or MBA) in the energy sector, this programme would facilitate this through its international, interdisciplinary, project-oriented course design.

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 engineering, physics, maths or computer science and information technology/informatics disciplines. 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

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

Risk and Reliability Engineering
You will learn about the principles of risk and reliability engineering and associated tools and methods to solve relevant engineering problems in industry. This includes the risk management process and reliability analysis techniques

Informatics for the Energy Industry
This module introduces data and information methodologies to solve problems associated with the design and operation of industrial systems using operational data available.

Advanced Control Systems
This module iintroduces fundamental concepts, principles, methodologies, and application for the design of advanced control systems for industrial applications.

Computational Fluid Dynamics for Industrial Processes
This module introduces the CFD techniques and tools for modelling, simulating and analysing practical engineering problems with hands on experience using commercial software packages used in industry.

Process Measurement Systems
You will learn how to apply a systematic approach to the design of measurement systems for industrial process applications The fundamental concepts, key requirements, typical principles and key applications of the industrial process measurement technology and systems will be highlighted.

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

Elective modules

(a selection of modules from the following list need to be taken as part of this course).

Process Design and Simulation
This module introduces the modern techniques and computer aided engineering tools for design, simulation and optimisation of process systems. Via large share of process simulation and optimisation case studies, the module provides hands-on experience of using the commercial software.

Heat and Power Generation Systems
This module provides an understanding of the fundamentals of operation, configuration and characteristics of thermal systems. You will also learn how to apply these for design of energy-efficient furnaces and boilers and key implementation issues of various types of power plant.

Advanced Optimisation of Process and Energy Systems
You will be introduced to fundamental principles and tools for the design, analysis and optimisation of processes and operations in the energy and process industry.

Group project

The group project enables you to put the skills and knowledge developed during the taught modules into practice in an applied context, while gaining transferable skills in project management, teamwork and independent research. Projects are often supported by industry and potential future employers value this experience. The group project is normally multidisciplinary and shared across the Energy MSc programme, giving the added benefit of working with students with other backgrounds.

Each group is given an industrially relevant problem to solve. During the project you will develop a range of skills including learning how to establish team member roles and responsibilities, project management, and delivering technical presentations. At the end of the project, all groups submit a written report and deliver a poster presentation to industry partners. This presentation provides the opportunity to develop presentation skills and effectively handle questions about complex issues in a professional manner.

Individual project

The individual research project allows you to delve deeper into a specific area of interest. As our academic research is so closely related to industry, it is common for our industrial partners to put forward real practical problems or areas of development as potential research topics. The individual research project component takes place between April and August.

Accreditation and Rankings

Cranfield ranks 5th in the UK for mechanical, aeronautical and manufacturing engineering in the QS World University Rankings 2019.

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For further information please visit
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