



Environmental Engineering

MSc, PgDip, PgCert



Suitable for engineering, science and geography graduates, the Environmental Engineering MSc will help you develop your career as an environmental engineer. Accredited by CIWEM, CIWM, and IAgRE, this course will equip you with the knowledge and skills required to solve a wide range of environmental engineering challenges, including municipal and toxic waste management and disposal, process emissions, contaminated land and water, waste disposal, and energy and resource recovery.

The course will provide you with:

- An advanced theoretical and specialist understanding of processes and practices central to environmental engineering.
- An ability to select and apply appropriate existing and emerging technologies that can achieve lower environmental impact via an integrated and cross-disciplinary approach.
- Scientific, technical and engineering principles, economic consequences and risks of environmental management options as best practice.
- Capacity to undertake successful technical research projects using appropriate methods of critical analysis.

Who is it for?

This 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.

We also welcome graduates currently in employment who are keen to gain further qualifications or to pursue a career change, or an individual with other qualifications and considerable relevant experience.

Informed by industry

The Environmental Engineering MSc has been developed in collaboration with industry, and practitioners contribute directly to the course by teaching alongside academics from Cranfield. This does not only provide evidence of the relevance of the programme but allows students to understand the practical implications of their learning.

Course structure

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

Future career

With the current global focus on the full range of environmental issues, graduates of this course can expect to be highly sought after by employers. Equipped with the advance knowledge and management skills to analyse processes, principles and practices essential to environmental challenges, you will have opportunities to pursue careers across a wide range of industrial and public organisations.

Successful graduates have been able to pursue or enhance careers in a variety of key areas such as:

Research Consultant, Environmental Scientist, Waste Consultant, Environmental Consultant, Site Engineer, Environmental Quality and Compliance Consultant, Risk Prevention & Environmental Engineer, Project Engineer, Research Engineer, Environmental Engineer, Environmental Project Manager, Supply Chain Manager, and Digital and Analytics Specialist.

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

Candidates must possess, or be expected to achieve, a first or second class UK Honours degree in a relevant engineering or science-based discipline, or the international equivalent of these UK qualifications. Other relevant qualifications together with industrial experience may be considered.

Overview of taught modules

Example modules

Modules form only part of the course content with the projects and theses making up the balance. Please see the course structure for details.

The list below shows the modules offered in the 2021-2022 academic year, to give you an idea of course content. To keep our courses relevant and up-to-date, modules are subject to change – please see the webpage for the latest information.

Compulsory modules

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

Catchment Management

The aim of this module is to improve understanding of the drivers of catchment hydrological processes with regard to water quantity and quality, and how these can be managed through engineering practices including drainage, irrigation and soil erosion control.

Cleantech in Water-Energy-Food Nexus

The aim of the module is to introduce the international priorities under the umbrella of the Water-Energy-Food nexus across sectors and scales.

Environmental Risks: Hazard, Assessment and Management

This module aims to provide an understanding of the theory and practice of effective management of all phases of environmental hazards. The module covers key topics including conceptual model development, probability, risk characterisation, and informatics.

Land Engineering Principles and Practices

This module teaches engineering skillsets (drainage, soil conservation, slope stabilisation, irrigation) required for the reclamation and restoration of degraded landscapes to improve the delivery of ecosystem goods and services.

Modelling Environmental Processes

An introduction to the full suite of environmental models and modelling methods that are currently used to describe and predict environmental processes and outcomes. The objective of this module is to give an overview of the different types of models currently being used to describe environmental processes and how they are being applied in practice.

Pollution Prevention and Remediation Technologies

The module introduces the extent and consequences of pollution in the environment, identifies and evaluates technologies for prevention and remediation and exposes you to using decision support tool and modelling to deal with pollution prevention and remediation.

Process Emissions and Control

An understanding of the major air pollutants emitted by key industrial processes is provided; including the associated regulatory frameworks, monitoring and modern emission control techniques.

Waste Management in a Circular Economy: Reuse, Recycle, Recover and Dispose

The aim of this module is to provide specialist understanding of the major processes used for municipal waste management and their role within an integrated – circular - waste management system. In particular the module will focus on the bottom three points of the waste hierarchy: recycle, recover and dispose.

Group project

The group project experience is highly valued by both students and prospective employers. It provides you with the opportunity to take responsibility for a consultancy-type project, working within agreed objectives, deadlines and budgets. For part-time students a dissertation or project portfolio can replace the group project.

Examples of recent group projects include:

- **Feasibility study** – environmental and run-off attenuation reservoir at Roxhill Manor Farm, Cranfield.
- **Renewable energy installations and climate change** – a scoping study of adaptation capacity, risk and vulnerabilities.
- **Engagement of retail customers in the circular economy.**
- **Assessing quality of silt from lagoons in mining sites as suitable subsoil medium for restoration.**
- **Decision support tool for landfill mining.**
- **Pre-treatment of organic waste material for improved biofuels production.**
- **Study of conversion of algae biomass to biocrude using hydrothermal liquefaction coupled with concentrated solar power.**

Individual project

The individual thesis project, usually in collaboration with an external organisation, offers you the opportunity to develop your research capability, your understanding of the subject and your ability to provide solutions to real problems in environmental engineering.

Accreditation

The MSc of this course is accredited by:

CIWEM Chartered Institution of
Water and Environmental
Management
Accredited Course



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