The underlying principle underpinning the Environmental Engineering MSc is to teach advanced scientific and engineering principles to promote sustainable development and improve environmental quality. The course aims to achieve this by providing the student with sound theoretical and practical multidisciplinary state-of-the-art knowledge that will enable them to apply an integrated cross-disciplinary approach towards solving a wide range of environmental engineering problems, such as risk management, municipal and toxic waste management, contaminated land and wastewater disposal and an understanding of energy and resource recovery. Students will gain a greater understanding of environmental engineering solutions with a global perspective.

Who is it for?
This course targets those who wish to develop a career using engineering principles to apply a holistic approach to environmental protection, covering a range of application sectors. Student backgrounds include:

- science, engineering, geography or related subject graduates keen to pursue careers in environmental or waste management
- graduates currently in employment keen to extend their qualifications or to pursue a career change
- individuals with other qualifications but who possess considerable relevant experience.

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

Informed by industry
Our annual industry advisory panel engages with external stakeholders to develop the curriculum design and ensure currency of the course content.

Sponsorship and support for individual thesis projects from employers provides professional experience and development opportunities for students.

Future career
On completion, graduates have a broader network of global contacts, increased opportunities for individual career development across a wide range of careers as professional scientists and engineers in the environment sector.

Some examples of the employers our graduates have gone onto to work for include: environmental consultancies (Golder, RSK, AECOM), local authorities, water utilities (Severn Trent Water, Thames Water, Veolia), remediation service providers, renewable energy companies and professional bodies (CL:AIRE, REA, CIWM).

This course will allow international students to return to their home countries having gained environmental protection knowledge and leadership skills critical for developing countries.

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

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

Circular Waste Management: Recycle, Recover and Dispose
A specialist understanding of the major processes used for municipal waste management and their role within an integrated, circular, waste management system is provided.

Environmental Risks: Hazard, Assessment and Management
This module provides an understanding of the theory and practice of effective management of all phases of environmental hazards. Key topics include conceptual model development, probability, risk characterisation, and informatics.

Pollution Prevention and Remediation Technologies
The extent and consequences of pollution in the environment are introduced. The student learns how to identify and evaluate technologies for pollution prevention, remediation, decision support tools and modelling.

Process Emission 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.

Soil Erosion Control: Principles and Practices
Soil conservation is taught through the control of water pollution and sedimentation by targeting erosion control measures at critical locations identified in the landscape.

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

Evaluating Sustainability through Lifecycle Approaches
A lifecycle assessment approach is used to teach the quantification and comparison of the impacts of goods and services that we consume on the environment such that we can apply mature, critical thinking to environmental claims.

Land Engineering and Water Management
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 currently used to describe and predict environmental processes and outcomes. Descriptions of practical applications are presented.

Risk Management and Reliability Engineering
Technologists learn skills required to commission, appraise and review risk assessments within the utility sector, specifically for water, wastewater and solid waste unit processes. The management and governance of risk are introduced.

Group project
The group project will provide you with the opportunity to work as part of a consultancy team, typically made up of students from more than one MSc course, over a period of 10 weeks.

The consultancy team is responsible for running the project and presenting the outputs of their work as a single project report and a presentation at the exhibition day at the conclusion of the group project period. Many of the projects are supported by external organisations giving you the opportunity to network with potential future employers.

Through the group project process you will be working on real challenges that are faced in the work environment where you will not only be able to apply the technical knowledge gained from the taught modules but you will be able to develop and enhance your team working, management of resources, reporting and presentation skills.

For part-time students a dissertation usually replaces the group project. The topic of the dissertation is typically proposed by the student and linked to their employment.

Examples of recent group projects include:

- 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 four-month individual research project can be carried out within industry or academia and for part-time candidates it can be undertaken in your place of work. This key part of the course allows you to apply the research skills acquired during the taught phase of the course to a practical problem in your area of specialism and acts as an opportunity for you to meet potential future employers. Typically you will have two supervisors who will provide advice and guide you through the research work. The individual project is assessed by the presentation of a written document in the form of a scientific paper and by an oral presentation of a poster to your examiners about your work.

Accreditation
The MSc of this course is accredited by: