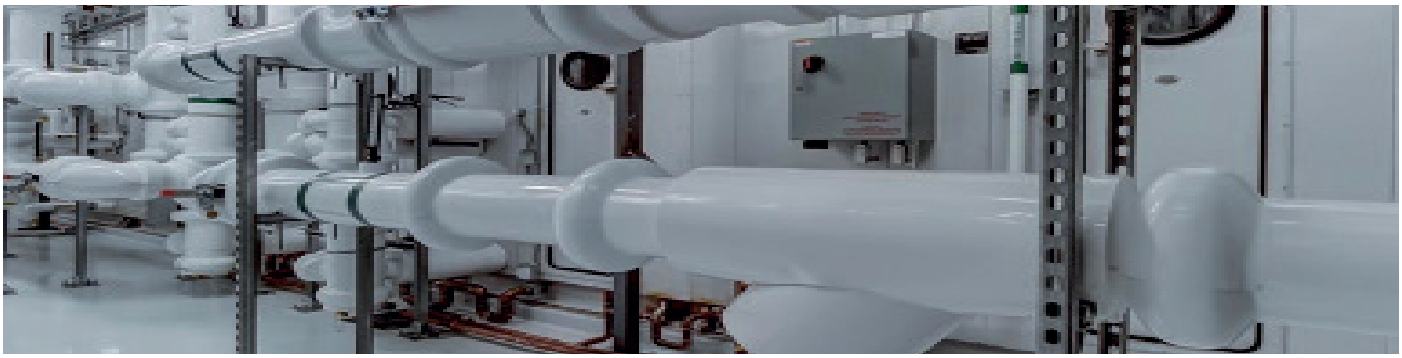
Water and Wastewater Engineering

MSc, PgDip, PgCert



Water is under increasing pressure from demographic and climatic changes. Water engineering and treatment processes play a key role in delivering safe, reliable supplies of water to households, industry and agriculture, and in safeguarding the quality of water. This course equips graduates with the skills to solve practical problems, communicate effectively and work successfully making them highly sought after by industry and government.

The Water and Wastewater Engineering course aims to develop:

- **Water and wastewater treatment scientists, technologists and engineers with the skills to solve practical problems, communicate effectively and work successfully both in teams and individually.**
- **High quality graduates trained and qualified to work in all areas of water and wastewater treatment and management enabling them to provide a valuable contribution to the UK and global water sectors.**
- **Understanding of water and wastewater systems through innovative teaching, achieved by blending theory, application and practice.**

Who is it for?

The Water and Wastewater Engineering course is ideal for individuals who want to make a real difference to delivering reliable water supplies, or to maintaining and enhancing river and ground water quality.

Well-educated, skilled and experienced graduates are required to operate and manage vital water and wastewater treatment services. The demand for such graduates is already high and will only increase over coming years as environmental standards for water quality increase, and pressures on our water supplies continue to grow.

Course structure

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

Informed by industry

This MSc benefits from input from an industry advisory panel with representatives from consultant, government, industry and charitable sectors, who help to ensure the course maintains its real-world relevance to the marketplace and industry focus. This involvement and direct contact with industry makes successful students highly sought after in the employment market.

Future career

Our graduates are highly sought after by industry and government, and demand has grown steadily as the education provided has become recognised as excellent. Some graduates progress on to academic research. This course produces graduates able to step into a range of positions and make an immediate and real contribution to the effectiveness of water sector businesses, and organisations such as Severn Trent Water, Anglian Water, Thames Water and DEFRA.

Cranfield Water Science Institute is recognised internationally as a centre of excellence for postgraduate courses. It is the UK's largest academic group specialising in process technologies, engineering and policy for water quality improvement, and is a member of British Water. The Institute's links to industry, underpinned by the reputation of its courses, enables successful students to secure positions and develop their careers in UK water companies, utilities across Europe, the major international engineering consultancies, major engineering and service contractors, and government agencies.

Graduated students are invited to join the Institute's Alumni Association which offers excellent networking opportunities throughout 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

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 2020-2021 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).

Science and Engineering Principles in Water and Wastewater Treatment
As the first module of the Water and Wastewater Engineering MSc, this module will provide you with a base of knowledge on which the subsequent modules will build. By broadly covering the water industry, conventional unit operations employed and the basic scientific and engineering principles - all essential knowledge for water and wastewater engineers. More specifically, as part of this module, you will first acquire knowledge of the water industry, its structure and processes, relevant regulations and applicable process economics. Subsequently, you will acquire general knowledge and understanding of the conventional water and wastewater treatment processes used in the industry, which will then all be covered in greater details in the following modules. Finally, you will learn about the basic scientific and engineering principles on which these treatment processes are based including water chemistry, hydraulics and pumping, mass balance, mass and heat transfers, reactor theory, chemical and biochemical kinetics.

Treatment Processes for Water and Wastewater
This module will provide you with the skills required to select, design and monitor water and wastewater processes in order to deliver safe drinking water or wastewater treated to the consents required to safeguard water body health. You will gain an understanding of and implement the design principles, practice and operation of conventional and advanced chemical, physical and biological processes for water and wastewater treatment.

Water and Wastewater Assets: Lifecycles, Risks and Futures
This module builds on previously acquired knowledge of technological solutions used in water and wastewater treatment by introducing a holistic approach with the aim to tackle future challenges faced by the water sector. You will cover a range of topics encompassing everything from the initial asset plans, understanding the risk to the assets and how are these risks changing and how do we address and manage these futures. This module is designed around the Asset Management Plan (AMP) cycle and includes topics broadly covering asset and risk management as well as future trends in the water sector.

Group project

The group project is an applied multidisciplinary team-based activity. It provides you with the opportunity, whilst working in teams under academic supervision, to apply principles taught during modules whilst taking responsibility for project tasks. Success is dependent on the integration of various activities, working within agreed objectives, deadlines and budgets. You will submit project reports and present their findings to representatives from industry. This develops professional practice in communication skills for technical and business areas of process development. Part-time students complete a single design project individually in a field of their choice.

Examples of recent group projects include:

- The Islanders
- Sustainable Living
- Surface water management strategy.

Individual project

You select your individual project in consultation with the thesis project coordinators. This provides you with the opportunity to demonstrate independent research ability working within agreed objectives, deadlines and budgets. The project is sponsored by industry and usually includes a four month placement with the sponsoring company. Placements have been offered by all ten of the UK water utilities, the leading two French utilities, as well as multinational companies and SMEs operating in the water sector. Part-time students usually undertake their individual project with their employer.

Accreditation and rankings

The MSc of this course is accredited by the Chartered Institution of Water and Environmental Management (CIWEM). As a graduate of the MSc course, you are eligible for graduate membership in this leading professional body.

CIWEM Chartered Institution of Water and Environmental Management
Accredited Course

In the QS World Rankings 2019, we were ranked 5th in the UK for Mechanical, Aeronautical and Manufacturing Engineering.

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