



Advanced Water Management

MSc, PgDip, PgCert



This course builds on our 30 year legacy in Environmental Water Management. It includes contemporary issues and innovations in water management and a unique integrated skills training programme to better prepare students for a challenging career in water.

Managing water is one of society's greatest challenges. What was once an abundant natural resource now requires careful management to ensure its availability and quality for future generations. Developed in partnership with leading organisations in the water sector, the Advanced Water Management MSc will prepare you for a successful and rewarding career optimising the use of water resources, in the water industry, government, consultancy, and the charitable sector.

Who is it for?

The course is ideal for graduates wishing to develop the expertise needed to solve environmental water management problems. It is designed to complement and expand your existing knowledge of science, policy and practice, making it suitable for students from a range of backgrounds. Recent students have joined us from undergraduate and postgraduate degrees in engineering (civil, hydraulic, agricultural), physical geography, chemistry and environmental sciences, as well as from professional careers.

Our strong industry links make the course particularly suited for those looking to work in the water industry, government or environmental and engineering consultancy, and in a wide range of roles including water quality, water resources, aquatic habitat and wildlife, flood defence, and policy.

The option to undertake the course on a part-time basis allows you to extend your professional development within your current employment.

Course structure

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

Informed by industry

Cranfield has unrivalled links with industry. Our students benefit from our extensive contacts and track record of close collaboration with government agencies and the water and environmental sector. These links include industrial advisory panels, group project sponsors and thesis consultants. Our courses are reviewed each year by a panel of industry advisors from leading companies and institutions in the sector. This ensures that the skills you acquire are up-to-date and what employers want. Some of the companies on our panel include: Anglian Water, CIWEM, Environment Agency, Future Water Association, International Medical Corps, JBA Consulting, Mott Macdonald, PumpAid, RRC, Save the Children and Severn Trent.

Future career

A degree from Cranfield will fast-track your career, enabling you to go further and to progress more quickly. Cranfield University Advanced Water Management graduates are located all over the world working at all levels of the water industry, government, environmental and engineering consultancy, and charitable sector. Therefore, our Advanced Water Management graduates join a large and supportable global alumni network.

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).

Good Ecological Status

Water bodies are fundamental features of the landscape. Whether they are rivers, canals, wetlands, ponds, lakes, estuaries or the open coast, they are important habitats that support diverse ecological communities and provide essential services to society. Therefore, countries have developed regulations to protect the quality of these water bodies and methods to assess status. Around the world, quality is increasingly being assessed based on a wide set of physical, chemical and biological attributes of the water body. In the UK, quality is assessed based on its ecological and chemical quality under the Water Framework Directive (WFD), which became part of UK law in 2003. This module will provide you with an overview of WFD and other relevant water quality regulation and policy that govern the management and assessment of surface waters. It will also provide you with a background in ecological processes, aquatic communities, and survey design and data analysis to help those working in environmental water management to interpret water quality data in the context of the catchment characteristics and pressures.

Managing Flood and Drought Risks

Extreme weather events are considered top global risks. Every year, many places around the world are affected by droughts and floods leading to severe impacts on people, the environment, agricultural and industrial production, and water supply infrastructure. Climate change will increase the frequency and severity of these natural hazards. Thus, we need to improve our ability to characterise and understand their occurrence, duration and intensity; and to effectively implement management responses to reduce vulnerability and minimise their impacts. In this module you will concentrate on droughts and floods, covering their definition, forecasting, impacts and management options. You will also focus on impact and management responses in three key sectors – domestic, businesses and the environment.

Surface and Groundwater Hydrology: Processes, Measurement and Modelling

This module concentrates on the conceptualisation, quantification and modelling of surface and groundwater hydrological processes. You will gain an understanding of rainfall, evapotranspiration, runoff, discharge, groundwater recharge, groundwater storage, and groundwater movement, all essential for those involved in the science, engineering or management of the water environment. The module further addresses how this understanding can be embedded within a range of different types of numerical models to address environmental and management challenges. The module offers you the opportunity to strengthen

your analytical abilities with a specific mathematical emphasis, including programming and modelling, which are key skills to launch future careers in science, engineering and technology.

Water in Cities and Catchments

There is a growing recognition that sustainable solutions to environmental water management problems require a coordinated approach. With climate change, aging infrastructure, and an increasing human population growth with its increased demand for urban development, food and water, we require creative and effective policy, management and technological solutions that address multiple problems and increase the resilience of our natural, economic and social systems. In this module, you will develop the skills to critically evaluate and analyse environmental data and information in a spatial context and to assess them in light of current drivers (e.g. regulatory and socioeconomic) to develop integrated solutions for water supply, wastewater treatment, water quality, flooding, conservation of aquatic ecosystems, etc.

Group project

A unique component of a Cranfield University taught MSc is the group project. Group projects are usually sponsored by industry partners and provide students with experience of working on real challenges in the workplace along with skills in team working, managing resources and developing reporting and presentation skills. Experience gained is highly valued by both students and prospective employers.

Examples of recent group projects include:

- Diffuse Water Pollution investigation in the Broads National Park
- Environmental farm reservoir feasibility study
- Integrated catchment planning
- Using GIS modelling with DEM to explore flood emergency response pathways
- Surface water management strategy.

Individual project

You select your individual project in consultation with the thesis project coordinators. The individual project provides 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. You have the choice to work on projects sponsored by industry or related to current Research Council, EU or industry funded research. Recent sponsors of individual projects include: AB Sugar, ASDA, Atkins, British Geological Survey, British Sugar, Canal and River Trust, Catchment Partnerships, Environment Agency, ESWAG, Innocent, Luton Borough Council, Marks & Spencer, River Restoration Centre, Royal Horticultural Society, WSUP, WWF-UK.

Accreditation

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:



Accredited Course

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

Every effort was made to ensure that the information on this document was correct at the time it was produced. Please check our website for the latest information. April 2020.