



Advanced Water Management

MSc, PgDip, PgCert



Managing water is one of society's greatest challenges. Droughts, floods, poor water quality and uneven water provision have social, economic and environmental consequences. Through our strong industry connections, you will gain the up-to-date knowledge and skills needed to propose sustainable policy, practice and technological solutions now and for our changing future. At Cranfield, we capitalise on our industry connections to provide you with the up-to-date skills and knowledge needed to tackle these challenges in a career in today's environmental water management 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

- Eight 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 2019-2020 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).

Aquatic Ecosystems

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. This module provides the necessary background in ecological processes, aquatic community structure and function, survey approaches, and assessment methods to design ecological studies and interpret their results within the context of current environmental regulation.

Catchment Water Quality

Water of good quality is necessary for domestic, environmental, industrial, recreational and agricultural applications. As a result of the conditions prevailing in the catchment area, natural and anthropogenic constituents in water bodies will define potential uses according to established criteria. Hence, for those working in water management a comprehensive understanding of regulations applying to water quality is needed. If quality is to be adequately monitored, it is also important to acquire knowledge about sampling and measurement of water parameters as well as interpretation of acquired data.

Drought and Water Scarcity

Droughts and water scarcity collectively represent a substantial threat to our natural environment, agricultural and industrial production, water supply infrastructure and societal well-being. Gaining a better understanding of the risk of a drought, including the likelihood of occurrence, duration and intensity, enables more informed management decisions. This module focuses on impact and management responses in three key sectors, domestic (public water supply), agriculture (rainfed and irrigated cropping) and the environment (aquatic and terrestrial ecosystems).

Flood Risk Management

This module considers the techniques for estimating flood probability, engineering and non-structural measures to reduce flood probability, economic techniques for evaluating flood consequences and current approaches to managing flood risk.

Integrated River Basin Management

There is growing recognition that sustainable solutions to environmental water management problems require a coordinated approach centred on the river basin scale. This is reflected in the holistic nature and administrative structure of current regulations and government initiatives and policies. In this module, you will develop the skills to analyse and interpret environmental data within a spatial context and to assess them in light of current drivers (e.g. regulatory and socioeconomic).

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

Modelling Environmental Processes

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. The module will offer 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. In addition, throughout various interactive learning events as well as the group-work based assignment, your social skills will be intensively trained.

Surface and Groundwater Hydrology

An understanding of rainfall, evapotranspiration, runoff, groundwater recharge, groundwater storage, and groundwater movement is essential for those involved in the science, engineering or management of the water environment. This module provides a conceptual and quantitative understanding of hydrology and the basic principles of hydraulics as a basis for later applied studies of water quality, water engineering, and water management.

Water in Cities

There is growing recognition that, as a result of rapid urbanisation, many of the key global challenges in water management will be faced by cities. This creates significant challenges for urban areas in terms of how to supply a growing population (in planned and/or unplanned settlements), how to manage ageing infrastructure, how to recover resources from wastewater, and how to interact with the natural environment. This module will examine these challenges and provide you with the skills to identify, contextualise and evaluate different urban water management technologies and approaches.

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:

- Integrated catchment planning
- Diffuse Water Pollution Investigation in the Broads National Park
- 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.

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:

CIWEM Chartered Institution of
Water and Environmental
Management

Accredited Course

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. September 2019.