MSc Environmental Management

The programme is made up of both core (120 credits) and optional modules (60 credits), divided into three vocational and thematic streams. If you have no prior statistical experience, it is recommended you take one of the statistical options. Students may choose to follow one stream or choose from a variety of options avoiding timetable clashes. Students are required to take a total of 180 credits overall. Our current modules are:

Programme Overview

Core Modules (120 credits)

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<tr>
<th>Module</th>
<th>Credits</th>
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<tr>
<td>Environmental Management : Principles and Practice</td>
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<tr>
<td>Resource and Environmental Economics</td>
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<td>Waste and Environmental Management</td>
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<td>Ecosystem Services</td>
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<td>Contemporary Issues in Environmental Law</td>
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<td>Research Skills and Career Learning</td>
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<td>Research Project</td>
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Optional Modules (60 credits)

Recommended:

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<tr>
<td>Research and Enterprise Micro-Placement</td>
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<tr>
<td>Quantitative Analysis of Environmental Data</td>
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<td>Qualitative Research Methods</td>
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Stream 1: Contaminated and Urban Environments

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<td>Laboratory analysis of soils and pollutants</td>
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<td>Plants, greenspace and urban sustainability</td>
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Stream 2: The Changing Environment

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Stream 3: Agriculture and Rural Environments
Issues in Agricultural Systems (20 credits)
Wildlife and Farming (10 credits)
Water agriculture and irrigation (10 Credits)
Agriculture in the Tropics (10 credits)
Principles of Integrated Pest Management (20 credits)
Rethinking agricultural development (20 credits)
Conservation Biology (10 credits)
Climate Change and Food Systems (10 credits)

Detailed Module Outlines

Core Modules

Environmental Management: Principles and Practice
Module Convenor: Dr Martin Wagner
Description: Using a series of lectures, case studies and field visits, this module examines the motivations for businesses and organisations to carry out environmental management, the ways in which environmental impacts are assessed and the systems employed to minimise environmental problems.
Aims: To introduce you to the ways in which the principles of environmental management are applied in professional settings.
Assessment: Report and oral presentation

Resource and Environmental Economics
Module Convenor: Dr Francisco Areal
Description: This module will cover the main issues in the field of environmental economics and is divided in two parts, one addressing the relationship between ecological and economic system and one focusing on the specific issue of valuing the environment contribution to human welfare.
Aims: To provide you with the basic tools necessary to understand the importance of the environment in human welfare and the limits of classical economic theory.
Assessment: In-class test, exam and practical skills assessment

Waste and Environmental Management
Module Convenor: Dr Steve Robinson
Description: This module will provide you with an understanding of the various ways in which underlying principles are applied to the management of environmental issues in the commercial world.
Aims: To provide you with an understanding of the origin and composition of a variety of industrial and domestic organic and inorganic wastes, their treatment and disposal.
Assessment: Essay and exam
Ecosystem Services

Module Convenor: Dr Martin Lukac

Description: This module provides a concise overview of the topic and uses examples of natural and managed ecosystems to illustrate the role of ecosystem services.

Aims: To enable you to understand the role of Earth’s ecosystems in underpinning human society and develop an understanding of the hidden subsidies and feedbacks which currently are often not considered and consequently not valued.

Assessment: Essay and exam

Contemporary Issues in Environmental Law

Module Convenor: Dr Mark Wilde

Description: This module is designed to provide in depth coverage of certain topical issues in environmental law. It is intended to be a freestanding module and does not depend upon existing knowledge of the subject. To this end it looks at the relationship between domestic, European and international environmental law.

Aims: To develop your appreciation of the relationship between law and policy, economics and science through appropriate exposure to political, scientific and economic arguments. To develop your understanding of the distinctive underlying principles and regulatory techniques have evolved ranging from technical standards on emissions to economic measures such as emissions trading.

Assessment: Essay

Research Skills and Careers Learning

Module Convenor: Dr Rob Batchelor

Description: This module provides a comprehensive knowledge of the resources, techniques and skills required for conducting independent research and critical analytical writing at Masters Level and for future study and employment within and beyond the discipline.

Aims: To enable you to access your own learning needs and provide the opportunity to gain practical experience in a range of ICT and data sources, and to develop your own independent research. You will also learn about publishing and presenting your work, interview techniques and article critiques.

Assessment: Written assignment and portfolio

Research Project

Module Convenor: Dr Elizabeth Shaw

Description: This module provides training in the skills required to devise, carry out and report a scientific project

Aims: The project, which may be in any appropriate area of Environmental Management, is intended to provide training in the skills required to devise, carry out and report a research project.

Assessment: Literature review and dissertation
Optional Modules (10 or 20 credits)

Recommended:

**Field Class**  
*Module Convenor:* Dr Tom Sizmur  
*Description:* The field class visits Dartmoor National Park and provides field examples of environmental problems discussed during the teaching terms.  
*Aims:* To provide students with the knowledge and practical skills for (i) Assessing environmental and human impacts at ecologically sensitive sites, (ii) Site investigation of contaminated soils, and (iii) The influence of effluent discharges on water quality.  
*Assessment:* Written reports

**Research and Enterprise Micro-Placement**  
*Module Convenor:* Dr Rob Batchelor  
*Description:* This module aims to help students apply their academic training within a research and/or enterprise environment. Research placements will provide the opportunity of working with a member of staff on a current project based in the UK or internationally. Enterprise positions will allow students to work on an externally-funded project or with an, environmental consultancy or government organisation to gain experience of working within an external commercial environment.  
*Aims:* This module aims to increase employability through relevant research/enterprise placement experience and to enhance ‘soft-skills’ such as team-work, communication, time-management and planning.  
*Assessment:* Tender document and oral presentation

**Quantitative Analysis of Environmental Data**  
*Module Convenor:* Dr Joanna Clark  
*Description:* This module will provide an overview of commonly used statistical and graphical techniques for environmental data analysis.  
*Aims:* To help you learn how to analyse environmental data by applying and interpreting the outputs from a range of classic and modern statistical methods using Minitab and ArcGIS.  
*Assessment:* Written report

**Qualitative Research Methods**  
*Module Convenor:* Prof Richard Bennett  
*Description:* This module will introduce you to qualitative research methods  
*Aims:* To provide students with an appreciation of the contribution of qualitative research methods to social science research, particularly in relation to economics and as applied in the fields of agriculture and food.  
*Assessment:* Essay and in-class test
Stream 1: Contaminated and Urban Environments

Pollutant Behaviour in the Environment

Module Convenor: Dr Elizabeth Shaw

Description: The module focuses on both the processes and applied aspects of pollutant behaviour in the environment with an emphasis on terrestrial and freshwater systems and their interface.

Aims: To provide you with a fundamental grounding in the physical and (bio)chemical processes underpinning the behaviour of pollutant chemicals in the environment, an introduction to the assessment of risk posed by environmental contamination and the objectives of, and strategies for, the remediation of contaminated sites.

Assessment: Essay and two written reports.

Environmental Pollution

Module Convenor: Dr Tom Sizmur

Description: This module will provide you with an understanding of the sources, transport pathways, uptake mechanisms and toxicity of key environmental contaminants. You will be able to identify sources, transport pathways and fate of key contaminants in the environment, measure their bioavailability, toxicity and risk, evaluate options for their remediation, and use environmental data to develop international legislation.

Aims: To develop an understanding of the mechanisms by which potentially toxic elements contaminate environmental media and cause toxicity to biological organisms.

Assessment: Essay, Annotated bibliography, and exam.

Laboratory Analysis of Soils and Pollutants

Module Convenor: Dr Geoff Warren

Description: This module introduces you to the main analyses which are applied to soils to determine their properties.

Aims: To provide you with laboratory skills related to good laboratory practice and the importance of care for health protection and precise results. The module introduces the apparatus used to determine the fate and behaviour of a whole suite of pollutants and develops good reporting and record keeping in the laboratory.

Assessment: Practical skills assessment and written report.

Environmental Consultancy

Module Convenor: Dr Geoff Warren

Description: In this module you will undertake a practical site investigation and develop a risk assessment of a site. The findings are presented to an expert panel under realistic conditions.

Aims: To teach the theory and application of techniques for contaminated site investigation and assessment with the subsequent presentation of the findings to clients.

Assessment: Written assignment, set exercise and oral presentation.

Air Pollution: Effects and Control

Module Convenor: Prof Richard Skeffington

Description: This module examines the effects and control of air pollution, enabling students to understand the issues and give them a basis for evaluating the controversies.

Aims: To promote an understanding of the nature and effects of human-induced air pollution and to assess some current controversies on the effects of air pollutants and the appropriate control measures to be applied.

Assessment: Essay, exam and oral presentation.
Environmental and Pollution Microbiology

*Module Convenor:* Dr Elizabeth Shaw

*Description:* This module provides an understanding of the major groups of microorganisms in soils, their adaptation to soil environments, and their impact on the wider environment.

*Aims:* To provide you with an understanding of the major groups of microorganisms in soils, their adaptation to soil environments, and their impact on the wider environment. Emphasis will be placed on the role of soil microorganisms in global cycling of C, N, P and S and in the degradation of natural and anthropogenic chemicals in the environment (biogeochemical processes).

*Assessment:* Essay, written report and exam.

Urban Ecology

*Module Convenor:* Dr Phil Baker

*Description:* This course will provide a detailed knowledge of the ecology of urban areas, both in the context of urban areas in the wider landscape as well as ecology within urban areas.

*Aims:* To explore how urban areas affect a range of taxonomic groups, how species have adapted to living within urban areas and how human-wildlife conflicts within urban areas arise and how these are managed.

*Assessment:* Written assignment, set exercise and oral presentation

Plants, greenspace and Urban Sustainability

*Module Convenor:* Prof Paul Hadley

*Description:* Case studies will be used to illustrate our relationship with the urban landscape and wider environmental issues. The module has a strong focus on urban environments and the use of appropriate greening interventions to improve human health and quality of life.

*Aims:* To provide you with an overview of the role of green infrastructure in supporting sustainable living in urban environments.

*Assessment:* Exam and oral presentation

Stream 2: The Changing Environment

Climate Change

*Module Convenor:* Dr Maria Shahgedanova

*Description:* This course examines natural and human-induced climate change with reference to examples from different parts of the world. It addresses interactions between climatic changes and conditions of economies and communities focusing on vulnerabilities to climate change, development of adaptation strategies and techniques, and assessments of barriers to adaptation.

*Aims:* To examine the nature of climate change, its impacts, and methods of adaptation with respect to various parts of the world and different environments and communities.

*Assessment:* Essay, seminar presentation and exam

Carbon and Global Change

*Module Convenor:* Dr Joanna Clark

*Description:* This module will provide students with an overall understanding of the global carbon cycle as a basis for evaluating recent advances in scientific knowledge on the impact of climate change, land use and atmospheric pollution on carbon cycling in natural environments.

*Aims:* To develop understanding about the global carbon cycle, and how it is linked to the water and other biogeochemical cycles, to enable assessment of the human impact on the carbon cycle and the implications for global change.

*Assessment:* Essay and policy briefing note
Climate Policy, Justice and Society

**Module Convenor:** Prof Chuks Okereke

**Description:** This module provides students the opportunity to explore on the one hand, the socio-political, economic and ethical challenges posed by climate change, and on the other hand, the effort being made by society at various scales – i.e. local, national, and international levels – to address the problem. Case studies include China, the UK, EU and a number of African countries.

**Aims:** The module aims to explore the various dimensions of climate change from geographical and political lenses, to establish why it is one of the most complex challenges facing humanity.

**Assessment:** Practical skills assessment, oral presentation and exam

The Science of Climate Change

**Module Convenor:** Prof Nigel Arnell

**Description:** This module provides an introduction to the science of climate change, aimed at students who do not necessarily have a scientific background.

**Aims:** The module provides the background for a deep and informed understanding of one of today’s key global challenges. Why is climate changing, and how will it change in the future? How can we predict future climate? What is a “dangerous” climate change? And how can we construct and use knowledge of climate change to inform adaptation and mitigation?

**Assessment:** Practical skills assessment, oral presentation and exam

Preparing for Floods

**Module Convenor:** Prof Hannah Cloke

**Description:** The module will provide a basis for understanding key issues in flood preparedness, from the local to the global scale, including flood forecasting and warning, response and incident management and building community resilience.

**Aims:** To develop a deep understanding of the components of flood preparedness strategies in different contexts and their relationship to science and policy.

**Assessment:** Essay, presentation and participation in discussions

Energy, Climate Change and Development

**Module Convenor:** Prof Nick Bardsley

**Description:** An overview of the social and economic processes contributing to climate change and proposed solutions, drawing on ecological economics and energy economics.

**Aims:** To provide a grounding in ecological and energy economics, and show how these can be applied to analyse the causes of climate change. To enable students to critically consider policies for climate change mitigation and adaptation. To foster an appreciation of the complex and holistic nature of the issues involved.

**Assessment:** Essay, learning log, class discussions
Global Environmental Change and Development

**Module Convenor:** Dr Andrew Ainslie

**Description:** The module provides a comprehensive overview of the major environmental and interrelated social problems plaguing developing countries, and the principal institutions and actors involved. The 20 credit version of this module continues in the Spring term to explore in-depth, empirical and case-study-based analyses of topical issues in the area of Global Environmental Change and Development and takes conceptual learning into the ‘real world’

**Aims:** The purpose of this module is to critically examine the theories and concepts that link Global Environmental Change and development.

**Assessment:** Essay and oral presentation (10 credits) plus, in addition, essay, “open-book” report and class participation (20 credits)

Climate Change and Food Systems

**Module Convenor:** Dr Gillian Rose

**Description:** This module will consider how human-induced climate change may impact on global food systems.

**Aims:** To combine knowledge of the global climate system with the response of ecosystems and agricultural productivity to climate variability and change in order to provide a basis for assessing the impacts of climate change on food production within the Earth system.

**Assessment:** Essay and exam

Stream 3: Agriculture and Rural Environments

Issues in Agricultural Systems

**Module Convenor:** Mrs Rebecca Morgan

**Description:** This module provides the contextual background in Agriculture, Ecology & Environment, integrating the ecology and environmental science with social and economic considerations. Content covers genetic and natural resources, energy use and greenhouse gas emission, biodiversity and landscape conservation, biosecurity and animal welfare and links through to the food chain, diet and consumer choice.

**Aims:** To develop knowledge of the underlying environmental, social and economic issues surrounding contemporary agricultural systems.

**Assessment:** Essay, annotated bibliography, and contributions to seminar debates

Wildlife and Farming

**Module Convenor:** Dr Simon Mortimer

**Description:** This module will focus on the history of the relationship between wildlife and farming, the population and community ecology of plants, invertebrates and vertebrates in agricultural ecosystems, management to promote biodiversity in farmland, and the role of biodiversity in delivering ecosystem services.

**Aims:** To provide an understanding of the interrelationship of farming practice and the abundance and distribution of wildlife in the countryside.

**Assessment:** Essay, exam, and presentation
Water, Agriculture and Irrigation  
**Module Convenor:** Dr Gillian Rose  
**Description:** This module will enable students to scrutinise the role of water in agriculture and development, evaluate different irrigation systems, and critically analyse the relationship between crop growth and yield and water use, and how to use water efficiently.  
**Aims:** To provide an understanding of the soil and plant processes which contribute to the management of water for crop production, and how these are used to schedule irrigation.  
**Assessment:** In-class tests, multiple choice tests and written assignment

Agriculture in the Tropics  
**Module Convenor:** Dr Alistair Murdoch  
**Description:** This module will consider tropical agriculture and agricultural systems, focussing on the physical, climatic, edaphic and biological factors affecting crop and animal production, and using case studies to show how these factors are interrelated and integrated in farming systems and livelihoods.  
**Aims:** To describe the major crop and livestock species and farming systems in the tropics and sub-tropics and explain how the distribution of farming systems and their component parts are influenced by biological, environmental, physical, edaphic, and socio-economic factors.  
**Assessment:** Essay and exam

Principles of Integrated Pest Management  
**Module Convenor:** Dr Michael Shaw  
**Description:** This module will introduce the major classes of organisms competing with people to consume crops and outline plant defences against them.  
**Aims:** To provide a mental framework for thinking about factors determining the impact of pests, disease and weeds: population growth and factors limiting it; natural enemies; movement from crop to crop in space and time and to show, by selected examples, how this impact depends on the whole cropping system.  
**Assessment:** Exam and practical skills assessment

Rethinking Agricultural Development  
**Module Convenor:** Dr Alistair Murdoch  
**Description:** There is a diversity of views about the issues, role and impact of agriculture for development and livelihoods. The key purpose of this module is to give you the opportunity to evaluate evidence critically so that you will be able to defend your own evidence-based opinion.  
**Aims:** This course aims to teach and stimulate critical thinking and evaluation about the issues, role and impact of agriculture (including horticulture) for development and livelihoods.  
**Assessment:** Written assignments and oral presentation
Conservation Biology

*Module Convenor:* Dr Graham Holloway

*Description:* The course will introduce conservation philosophy and how it sits within socio-economic reality. Threats to biodiversity from habitat loss, invasive species, pollution and global climate change are extensively explored. Strategies deployed to counteract biodiversity loss are considered and the strengths and weaknesses of these strategies are examined.

*Aims:* To provide students with an understanding of the science of conservation biology and its use in the sustainable management of genes, species, communities and habitats.

*Assessment:* Exam, report and in-class test

Climate change and Food Systems

*Module Convenor:* Dr Gillian Rose

*Description:* This module will consider how human-induced climate change may impact on global food systems.

*Aims:* To combine knowledge of the global climate system with the response of ecosystems and agricultural productivity to climate variability and change in order to provide a basis for assessing the impacts of climate change on food production within the Earth system.

*Assessment:* Essay and exam