






Taught **Masters Programmes**

Training you towards a sustainable future




The Lancaster
Environment Centre

LANCASTER
UNIVERSITY




Contents

Introduction

Lancaster University is ranked in the top one percent of universities in the world, listed at 145 in the Times Higher Education international table (2012). The growing reputation of Lancaster is reflected by high rankings year on year in each of the UK's major university league tables – The Times (12th), the Guardian (7th) and the Complete University Guide (9th).

Students at Lancaster University are more satisfied with their course than the average UK student according to the National Student Survey 2012. Overall, 91 percent of final year students at Lancaster say they were satisfied with their course. These results reflect the dedication of staff, who work hard to ensure that every student who comes here receives the very best education.

The Lancaster Environment Centre (LEC) is a major development on Lancaster's campus, bringing together a community of university environmental researchers, government scientists and a growing number of commercial enterprises. The emphasis is on delivering excellence in teaching and research across our core themes of atmospheric science, biodiversity and global change, sustainable water management, geosciences, and the relationship between society and the environment.

Students learn through lectures and seminars, and gain practical skills and research experience during their dissertation project. Teaching by world-class scientists within a well funded research environment means that postgraduate students in LEC receive the best opportunities to help them start their careers.

What makes studying for a postgraduate degree in LEC one of the best experiences in the UK?

- **We give our students excellent training in the key areas of the environment, in purpose-built and state-of-the-art facilities.**
- **Our courses are exceptionally flexible and integrated and are taught by highly dedicated and experienced staff.**
- **Our students are able to undertake research projects either within LEC or with our research partners in the UK, Europe or further afield in China, Brazil, Asia and West Africa.**
- **Our students can develop close links with industry through our industry-linked projects.**
- **Opportunities for environmentally related employment are excellent.**

Industry Links and Placements

In addition to gaining a masters, work experience and placements provide a central component of developing employability, and we offer several opportunities to broaden your horizons during your postgraduate course.

LEC hosts an Enterprise and Business Partnerships (EBP) unit which develops collaborative links between the University and the commercial sector, and provides postgraduate students with an opportunity to gain real-world experience through working on a collaborative project within either the public or private sector. The EBP graduate projects are designed to provide a full research dissertation, and we annually engage with over 40 businesses, both in the UK and throughout Europe.

Additionally, there are opportunities to join the LEC-led summer school in South China, which is a collaboration between Lancaster University and the Chinese Academy of Sciences. Here, the focus is on global food security: China has achieved great success in feeding its population but a strong desire to reduce the environmental impact of agriculture and a range of other environmental and social considerations, raise particular issues for the future. Students experience a broad spectrum of life in China and are able to interact with researchers working with smallholder farmers to enhance knowledge exchange.

Careers Preparation and Prospects

Gaining additional skills and experience in preparation for professional employment is one of the key reasons why students choose to undertake a taught masters degree. At the Lancaster Environment Centre, students are required from the very beginning of their course to plan for future careers and to ensure they are acquiring the necessary skills through their choices of modules and by undertaking extra-curricular activities. All of our students are encouraged to register for the Lancaster Award, which formally recognises and rewards students who undertake voluntary work, gain work experience and take part in careers training sessions offered by the Centre for Employability, Enterprise and Careers (CEEC).

Careers workshops and training events are on offer within LEC throughout the academic year, including sessions where current students receive advice from former students who are now working professionally in the environmental field.

LEC graduates go on to work for utility companies, environmental consultancies, non-governmental environmental organisations, research institutes, central and local government, and in many other professions related to the environment. Our most recent data show that 91% of our students are either employed or undertaking a PhD, and 60% of those employed are working in the environmental sector.

Laura Hartley, LEC Masters Graduate

"The masters has broadened my experience and enabled me to change my career path from aquatic ecology to terrestrial ecology. I would not have got my current job as an ecologist at Capita Symonds without the masters degree and the experience that I gained from it."

United Utilities

Centre for Assessment Ltd

Environment Agency

THE NATIONAL TRUST

Envirolink

Apollo energy

BPB BritishGypsum

SMALL WORLD CONSULTING

MSc Contamination, Risk Assessment and Remediation

Chemical contamination is a world-wide problem and represents a significant threat to the environment, to ecosystem functioning, and to human health and our society as a whole. This specialist Masters programme covers many aspects of risk assessment and remediation in different environmental systems and is supported by a strong research base providing highly contemporary material.

Teaching and research links with key agencies involved in studying and controlling this threat as well as to leading academic material. Case studies are used extensively to illustrate the application of the taught material and specifically include detailed investigations into environmental accidents, their risk assessment and remediation.

You will gain the scientific, analytical and communication skills required to prepare you for remediation work with local authorities and industry, with the Environment Agency, or in consultancy.

Nick Brewer

"Although I had a sound working knowledge of the consultancy industry, there were certain specialist areas (such as environmental radioactivity and bioremediation) that I did not have direct experience in. The course gave me an additional background to many areas within the subject of contaminated land and remediation to complement my working knowledge. ***I am now employed by Golder Associates in Adelaide, South Australia as a Senior Environmental Scientist. I can now enjoy applying my knowledge and experience to new and exciting projects in this region.***"

STUDENT PROFILE

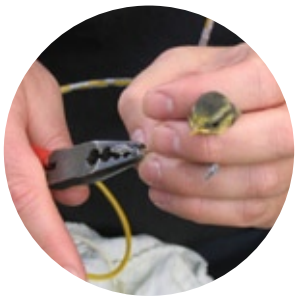
Core

Behaviour of Pollutants in the Environment
Chemical Risk Assessment
Contaminated Land and Remediation
Dissertation Project
Pollution Microbiology

Options

Data Analysis and Interpretation
Data Analysis and Programming Skills
Data Assimilation and Integration
Disaster Management
Environmental Applications of Isotope Geochemistry
Environmental Radioactivity
Environmental Sampling and Analysis for Trace Organics
Environmental Toxicology
Geoinformatics
Geological Hazards
Groundwater Resources and Protection
Numerical Skills





MSc Ecology and Conservation

The MSc in Ecology and Conservation is one of our most popular postgraduate schemes. At the heart of its success is flexibility of choice from a wide range of modules that meet the needs and interests of any student of ecological or conservation sciences. This vocational degree offers you the chance to blend ecological and environmental science topics with those from areas such as social science, geography, and statistics.

This MSc provides you with an understanding of the relationships between living organisms and their physical, chemical and biotic environment while also providing important specific skills related to environmental monitoring and management.

The course also develops transferable skills appropriate to a career in research, consultancy or industry. Graduates have gone on to pursue careers in the environmental and conservation sectors, as well as progressing to further study for a PhD.

Ellie Rickman

"I learnt practical skills that have stood me in good stead when looking for work, such as using GIS and the NVC. I also gained a good theoretical grounding in conservation, habitat management and some of the key issues and problems in ecological decision making. It was a very rounded course and being able to select modules to suit my own interests and career direction made it particularly beneficial. ***I am currently working in the Cairngorms area of Scotland as a woodland survey ecologist. I am part of an ambitious six year project by Forestry Commission Scotland to map and assess all native woodlands and planted woods on ancient woodland sites throughout Scotland."***

STUDENT PROFILE

Core

Dissertation Project

Options

Air Quality and Climate
Advanced Laboratory Methods for Environmental Sciences: Theory and Practice
Biological Effects of Air Pollution and Climate Change
Chemical Risk Assessment
Conservation Biology
Contaminated Land and Remediation
Crop Protection
Data Analysis and Interpretation
Data Assimilation and Integration
Environmental Management
Environmental Toxicology

Options (continued)

Food Security, Agriculture and Climate Change
Geoinformatics
Habitat Management
Lake Ecology
Modelling Environmental Processes
Pollution Microbiology
Sustainable Soil Management
Using the National Vegetation Classification System
Wildlife Monitoring Techniques
Wildlife Population Ecology

MSc Energy and the Environment

The use of energy derived from coal, oil and gas is releasing large quantities of carbon to the earth's atmosphere which has been buried in fossil environmental reservoirs for tens of millions of years. This carbon is both causing present-day changes to climate and, more importantly, is committing society to very significant changes in the future.

In recognition of the threats presented by climate change, the UK has taken a lead on global climate policy and committed to an 80 percent reduction in greenhouse gas emissions by 2050. Because the use of carbon-based energy is so fundamental to the operation of our entire socio-economic system, meeting this target will represent one of the grand challenges of the next 40 years as we attempt to change both the sources of the energy we use and the ways in which we use these. A large number of scientists (both social and natural) and engineers with system-wide expertise will be needed to achieve this.


Image courtesy of NASA

The MSc Energy and Environment is designed for those wishing to develop careers in this challenging and exciting area. The taught component of the programme comprises 50 percent of the assessment, and is highly interdisciplinary, encompassing environment, engineering and policy. The remaining 50 percent of the assessment is an extended research project working on an energy sector application. These projects may be developed in conjunction with an industrial partner identified through the Enterprise and Business Partnership unit within LEC. These industry projects will not only give valuable industry-relevant training, you will also be able to claim a substantial amount of work experience from this for your cv.

Core

Dissertation Project
Environmental Management
Low-Carbon Energy Use
Renewable Energy
Sustainable Systems

Options

Air Quality and Climate
Catchment Protection Field Course
Climate Change and Society
Data Assimilation and Integration

Options (continued)

Energy Conversion
Environmental Auditing
Environmental Justice
Environmental Radioactivity
Food Security, Agriculture and Climate Change
Geoinformatics
International Environmental Law
Numerical skills
Perspectives on Environment and Development
Sustainable Water Management: Concepts, Governance and Practice
The Nuclear Safety Environment



MSc Environmental and Biochemical Toxicology

Environmental and Biochemical Toxicology are disciplines that underpin a vast array of services. There is a recognised shortage of qualified scientists in such areas; a fact highlighted both by academic societies and industry.

This MSc provides you with an appreciation of the underlying principles of how chemicals adversely affect living organisms. This includes appreciating the diverse applications of toxicology, from identifying mechanisms through to hazard assessment, and understanding the effects on human health, in terms of biotransformation, mutation and neurological impairments.

We emphasise practical experience gained through the use of cutting-edge techniques in research laboratories. You will also learn general scientific skills in hypotheses testing, problem solving, dealing with scientific literature, and experimental design and rigour.

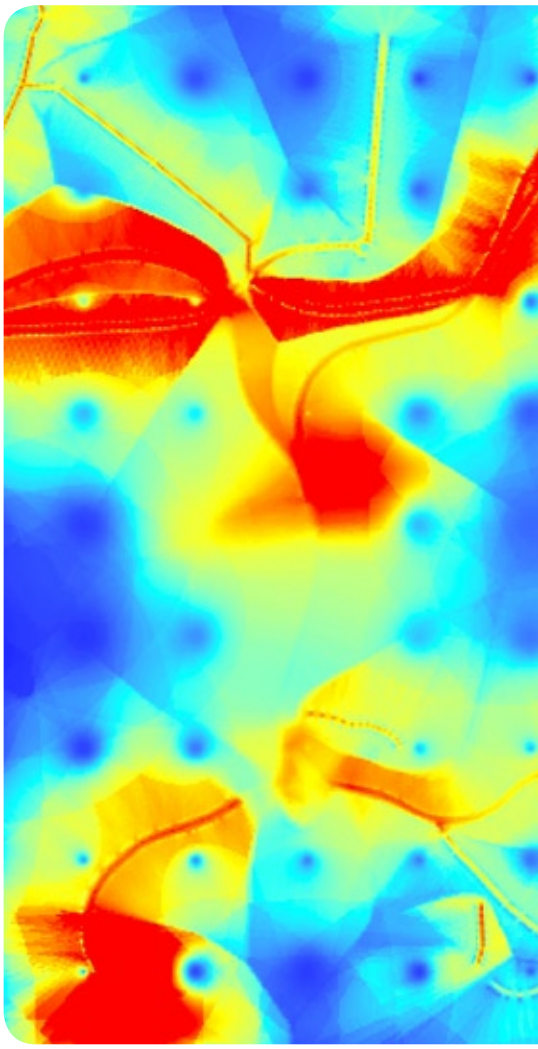
At the end of your Masters you will be ready to enter consultancy or industry or to progress to PhD study

Core

Consequences of Toxic Effects
Dissertation Project
Toxicological Mechanisms and Measurements

Options

Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Cell Biology Research Skills
Chemical Risk Assessment
Clinical Trials
Contaminated Land and Remediation
Data Analysis and Interpretation
Data Assimilation and Integration
Disaster Management
Disease of the Brain
Drug Development
Environmental Epidemiology
Environmental Radioactivity
Environmental Sampling and Analysis for Trace Organics
Environmental Toxicology
Fundamental Research Skills
Genomics - Technologies and Analyses of its Data
Immunology
Microbes and Disease
Models of Disease and Ageing
Molecular Basis of Cancer
Molecular Biology Research Skills
Numerical Skills
Pollution Microbiology
Principles of Epidemiology
Water Quality Modelling



Modeled air pollution surface



MA/MSc Environment and Development

This programme provides a solid grounding in the interlinked fields of current Environmental concerns and Development issues, the integration of which is critical if sustainable development is to be practiced in the UK and worldwide. The extensive breadth of disciplines covered within LEC provides a research environment that allows this programme to offer a large variety of modules in both environmental and development specialisms, taught by staff who are internationally recognised in their fields. The course would be of interest to anyone whose interests or career aspirations are directed towards addressing the challenges faced in safeguarding the planet's ecosystems and improving the social and physical environments in which impoverished communities live. The programme is suitable for students with either a natural or social science background as the choice of modules allows the programme to be tailored towards an individual's interests and focus.

Students will graduate with either an MA or an MSc, depending on their choice of dissertation topic. Dissertation topics are offered in both environmental and developmental themes, with options for fieldwork both in the UK and abroad. We currently have dissertation projects on offer in Asia, Africa and South America, usually working with universities and NGOs in the host countries (for example The University of Zambia; The University for Development Studies, Ghana; Green Living Movement, Zambia; University of Dhaka, Bangladesh; Tribhuvan and Kathmandu Universities, Nepal; Indian Statistical Institute, Kolkata and Indian Institute of Technology, Roorkee, India; Guangzhou Institute of Geochemistry, China, to name but a few). This optional overseas dimension to the programme provides vital experience for those intending to enter employment in the overseas environment/development sectors. Partial financial support is available for some overseas dissertation projects.

This programme offers an excellent opportunity for students to combine a depth of focus in their chosen specialism, with a breadth of focus in environmental and developmental issues. Such interlinked knowledge is a key requirement for anyone interested in following a career path addressing environment and development concerns, in the private, public, or not-for-profit sectors.

Core

Dissertation Project
Perspectives on Environment and Development
Research Methods (for MA stream only)

Options *

Air Quality and Climate
Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Catchment Protection (Field course)
Chemical Risk Assessment
Climate Change and Society
Consequences of Toxicological Effects
Conservation Biology
Contaminated Land and Remediation
Crop Protection
Data Analysis and Interpretation
Data Analysis and Programming Skills
Data Assimilation and Integration
Disaster Management
Ecology, Conservation and Culture

Options * (continued)

Environment and Culture
Environmental Auditing
Environmental Justice
Environmental Management
Environmental Radioactivity
Environmental Toxicology
Environmental Sampling and Analysis for Trace Organics
Flood Forecasting and Flood Risk Management
Food Security, Agriculture and Climate Change
Food Security and Environmental Issues in China (TBC)
Geoinformatics
Geological Hazards
Globalisation and Democratisation (TBC)
Groundwater Resources and protection
Habitat Management
Health and Environment
International Environmental Law
Lake Ecology
Low-carbon energy use

Options *(continued)

Modelling Environmental Processes
Numerical skills
Pollution Microbiology
Right to Adequate Food as a Human Right
Sustainable Soil Management
Sustainable Systems
Sustainable Water Management: Concepts, Governance and Practice
The Rights of Peoples
Toxicological Mechanisms and Measurements
Using the NVC
Water Quality Modelling
Wildlife Monitoring Techniques
Wildlife Population Ecology

*** As these are advanced level courses, registration on some modules is subject to the student having an undergraduate level of prior knowledge in the subject.**

MA/MSc Environment, Culture and Society

This is an innovative interdisciplinary course aimed at those who want to combine hands-on and conceptual approaches in order to engage critically, practically and creatively with global environmental problems. Human-induced environmental change has reached a level at which there is talk in both the physical and social sciences about a new geological epoch – referred to as the Anthropocene. While the scale of these changes may seem daunting, the growing recognition of the urgency and the magnitude of environmental challenges also provides opportunities for new kinds of understanding and engagement. In the face of mounting alarm around such issues as food security, climate change, emergent risks and energy futures, novel critical perspectives and forms of commitment are needed - and increasingly valued - in the academic, NGO, business and government sectors.

This course brings together vital insights from sociology and geography, and draws on cutting edge social, cultural and environmental theory. The program gives new meanings to the notion of 'sustainability' in a fast-changing world, and recognises that finding new ways to lever societal transformation also requires an understanding the dynamics of environmental and earth processes.

Staff have strong advisory and advocacy links with a range of scientific, policy, industrial and civic communities. This provides opportunities for research placements and practical engagement experience. The combination of critical theory, experimental natural sciences and access to empirical real-world contexts creates a unique course for anyone seeking to add value to their academic and/or applied career trajectory. You can choose between an MA or MSc pathway through the course, allowing you to build your own postgraduate degree from a selection of social and natural science modules offered by the Sociology Department and Lancaster Environment Centre.

Core

Dissertation Project
Environment and Culture: Issues, Politics and Institutions
Researching Environment and Culture
Research Methods

Options

Climate Change and Society
Disaster Management
Ecology, Conservation and Culture
Environmental Justice
Food Security, Agriculture and Climate Change
Geoinformatics
Geological Hazards
Habitat Management
Perspectives on Environment and Development
Policy, Publics and Expertise
Science and Technology Studies
Social and Cultural Theory
Sustainable Water Management: Concepts, Governance and Practice
Wildlife Monitoring Techniques



MA Environmental Management and Consultancy

Whether it is the board rooms of multinational corporations or the offices of small enterprises, the environment is now a fundamental part of business decision making. In an increasingly complex and competitive business environment, managers need to understand the commercial opportunities that the environmental sector offers, as well as the standards of performance which customers, shareholders and regulatory agencies now expect. The MA in Environmental Management and Consultancy prepares you for these challenges, enabling you to develop: skills for decision making; specialist environmental knowledge; and the ability to solve problems in real-world situations. Core modules in environmental management and environmental auditing and a wide range of optional modules in the natural and social sciences are delivered by the Lancaster Environment Centre (LEC). A core module in environmental law is provided by the internationally renowned Lancaster University Law School. The programme also includes a 6 month research placement where you will have the opportunity to put your knowledge and skills to the test by working for a small-medium sized company, a public sector body or voluntary sector organisation.

Tom Wright

"Lancaster Environment Centre's Environmental Management and Consultancy course gave me the opportunity to complete two periods of work experience with SMEs in the North West as part of my Masters degree, as well as another separate piece of extracurricular project work for another company through LEC's Enterprise and Business Partnerships team.

I chose to study at Lancaster for this reason, as the course offered structured work experience for which I could receive detailed feedback, real world consultancy experience and an entry on my CV.

The clients I worked for had real projects which were vital to their businesses, and being able to work on them and add value to these businesses while gaining practical consultancy experience at the same time was invaluable, and has led to me securing employment with a North West based Consultancy."

STUDENT PROFILE

Core

Dissertation Project (With Placement)
Environmental Management
Environmental Auditing
International Environmental Law
Research Methods (unless the student has already taken a social science research methods course at UG level)

Options

Air Quality and Climate
Behaviour of Pollutants in the Environment

Options (continued)

Catchment Protection (Field course)
Chemical Risk Assessment
Climate Change and Society
Conservation Biology
Contaminated Land and Remediation
Disaster Management
Ecology, Conservation and Culture
Environment and Culture
Environmental Justice
Environmental Radioactivity
Flood Forecasting and Flood Risk Management
Food Security, Agriculture and Climate Change
Geoinformatics

Options (continued)

Geological Hazards
Groundwater Resources and Protection
Habitat Management
Low-carbon energy use
Numerical Skills
Perspectives on Environment and Development
Renewable Energy
Right to Adequate Food as a Human Right
Sustainable Water Management: Concepts Governance & Practice
Sustainable Soil Management
Sustainable Systems

MSc Environmental Science and Technology

Increasingly, novel technologies are developed from and applied to the environmental sciences. Areas such as informatics, sensor networks, imaging techniques and pollution remediation technologies are impacting the way we view and manage the environment. The MSc in Environmental Science and Technology programme explores this field using a comprehensive range of environmental science and technology modules that allow you to develop your chosen area.

For example, you may wish to specialise in areas of earth science, investigating geological hazards and associated risk abatement technologies, or, alternatively, focus on flood forecasting software and novel passive sampler technology for measuring water pollution.

As well as gaining knowledge in one or more areas of environmental science and technology, you will also develop skills in statistics and computing, making you a confident and competent handler of data. Graduates will typically find themselves working for consultancies, government organisations or going on to study for a PhD.

There is a one year full time or two year part time taught MSc in Environmental Science and Technology, which comprises of 6 specialised taught modules, followed by an individual piece of research. There is also a two year full time International MSc (Research) in Environmental Science and Technology, which also comprises the 6 specialised taught modules, and includes a 12 months overseas research placement. (See overleaf)

Core

Dissertation Project

Options

Air Quality and Climate
Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Catchment Protection. Field Course
Chemical Risk Assessment
Consequences of Toxic Effects
Contaminated Land and Remediation
Crop Protection
Data Analysis and Interpretation
Data Analysis and Programming Skills

Options (continued)

Data Assimilation and Integration
Disaster Management
Environmental Applications of Isotope Geochemistry
Environmental Radioactivity
Environmental Sampling and Analysis for Trace Organics
Environmental Toxicology
Flood Forecasting and Flood Risk Management
Food Security, Agriculture and Climate Change
Geoinformatics
Geological Hazards
Groundwater Resources and Protection
Isotope Geochemistry in the Environment

Options (continued)

Lake Ecology
Modelling Environmental Processes
Numerical skills
Physical Volcanology
Pollution Microbiology
Renewable Energy
Sustainable Soil Management
Toxicological Mechanisms and Measurements
Water Quality Modelling
Wildlife Monitoring Techniques

MSc (Research) International Master's in Environmental Science and Technology

The International MSc (Research) in Environmental Science and Technology is a 2-year Masters programme awarded by Lancaster University and delivered in partnership with relevant Institutes within the Chinese Academy of Sciences (CAS). The degree aims to provide Masters students with training in environmental sciences and its commercial application through world leading research institutions in both the UK and China. Students will study in Lancaster Environment Centre (LEC) in the UK for the first year of the programme and take a range of taught modules considering fundamental and applied aspects of environmental sciences. During this first year students will exploit established links between LEC and CAS to lay the foundations for the research project they undertake. This project will start in the UK during the first year of study and continue full time in China during the second year within the Chinese Academy of Sciences unless students elect to conduct all their research within the UK. Many of these projects will involve active collaborations with partner commercial organisations with international focuses hence providing students with sponsorships and unique experiences of working at the interfaces between environmental science and its application in different cultural settings.

Students from China, other overseas countries, the UK and other European countries are eligible to apply. This programme has open exit routes to PhD study, or students can graduate with the standard MSc programme at the end of Year 1.

Yafei Tang

"The diverse modules in LEC have given me insight into the future of environmental science from many different perspectives. The placement in Unilever provided by LEC has enabled me to realize how innovative science was transformed into innovative technology and how research achievement supports the development of business. This has broadened my horizons. By working with world-class experts my research skills have also been greatly enhanced."

STUDENT PROFILE

Core

Dissertation project (Year 1)
Research Dissertation (Year 2)

Options

Air Quality and Climate
Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Catchment Protection. Field Course
Chemical Risk Assessment
Consequences of Toxic Effects
Contaminated Land and Remediation

Options (continued)

Crop Protection
Data Analysis and Interpretation
Data Analysis and Programming Skills
Data Assimilation and Integration
Disaster Management
Environmental Applications of Isotope Geochemistry
Environmental Radioactivity
Environmental Sampling and Analysis for Trace Organics
Environmental Toxicology
Flood Forecasting and Flood Risk Management
Food Security, Agriculture and Climate Change
Geoinformatics

Options (continued)

Geological Hazards
Groundwater Resources and Protection
Isotope Geochemistry in the Environment
Lake Ecology
Modelling Environmental Processes
Numerical skills
Physical Volcanology
Pollution Microbiology
Renewable Energy
Sustainable Soil Management
Toxicological Mechanisms and Measurements
Water Quality Modelling
Wildlife Monitoring Techniques

MSc Resource and Environmental Management

The management of land, air, water and other resources for sustainable development is a major challenge for the 21st century. This very popular and vocationally-relevant MSc provides students with an in-depth critical understanding of the key management issues and challenges, as well as enabling them to develop problem-solving skills and practical knowledge for future employment in the environmental field. Students are able to customize their learning because of the very wide range of optional modules in the natural and social sciences which is available for this programme of study. Core modules in environmental management and environmental justice are delivered by the Lancaster Environment Centre (LEC). Optional modules include environmental law, climate change and society, water resources management, disaster management, geo-informatics, and environment and social culture. The programme offers students the option of undertaking a 6 month research placement with a private sector company, government body or voluntary sector organization as an alternative to a traditional dissertation.

Core

Dissertation project
Environmental Justice
Environmental Management
Geoinformatics
Research Methods

Options

Climate Change and Society
Ecology Conservation and Culture
Environment and Culture
Environmental Auditing
International Environmental Law
Perspectives on Environment and Development
Right to Adequate Food as a Human Right
Sustainable Water Management: Concepts Governance and Practice



MSc Sustainable Agriculture and Food Security

The Lancaster Environment Centre has established an MSc in Sustainable Agriculture and Food Security to train a new generation of researchers and policy makers in this developing area.

With the world's population fast approaching seven billion, one of the main challenges facing the human race is how to feed its people. It's estimated that a rise in food production of at least 50% will be needed by 2030 to meet increasing food demands, against a backdrop of accelerating climate change and increasingly unpredictable weather extremes. Furthermore, society expects that this additional food be delivered with reduced environmental impact and without greatly increasing the world's cropping area. The challenge is a truly sustainable agriculture that meets both production and environmental targets.

However, food production itself is only part of the problem. Food security isn't just about exploiting scientific and technological advances to increase crop yields, it's also about addressing the associated economic and social factors to enable people to access sufficient, safe and nutritious food. If we are to successfully address the issue of food insecurity, then some understanding of a broad range of underpinning issues is necessary. Increasingly, interdisciplinary training and research with an international focus will be required.

There is a one year full time or two year part time taught MSc in Sustainable Agriculture and Food Security, which comprises 6 specialised taught modules, followed by an individual piece of research. There is also a two year full time International MSc (Research) in Sustainable Agriculture and Food Security, which also comprises the 6 specialised taught modules, and includes a 12 months overseas research placement. (See opposite)

Core

Crop Protection
Dissertation Project
Food Security, Agriculture and Climate Change
Sustainable Soil Management

Options

Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Catchment Protection, Field Course
Conservation Biology
Contaminated Land and Remediation
Data Analysis and Interpretation
Environmental Management
Food Security and Environmental Issues in China (TBC)

Options (continued)

Habitat Management
Numerical skills
Perspectives on Environment and Development
Pollution Microbiology
Sustainable Systems
Sustainable Water Management: Concepts, Governance and Practice
Right to Adequate Food as a Human Right

MSc (Research) International Master's in Sustainable Agriculture and Food Security

This two year Masters programme is awarded by Lancaster University and delivered in partnership with China Agricultural University (or after discussion, with another institution in an international hotspot for Food Security – Lancaster has a range of high quality research partners in this area such as the Federal University of Lavras, Brazil; the University of Missouri, USA and BHU Varanasi, India). Students will study at Lancaster University in the UK for the first year of the programme and take the range of taught modules offered on the standard masters version of this programme. At an early stage during this first year, students will also begin to work with LEC-based academics or a UK-based company to develop plans for a collaborative project in China (or elsewhere). This project will start in the UK during the first year of study and continue overseas during the second year This MSc route aims to provide students with significant experience in Food Security and Sustainable Agriculture, its commercial application and experience of directed study and independent research in leading institutions in both the UK and overseas.

Applicants for the International Masters in Sustainable Agriculture and Food Security should discuss the scheme and its suitability for them with:

Dr. Ian Dodd **(i.dodd@lancaster.ac.uk)** ***or***
Professor Bill Davies **(w.davies@lancaster.ac.uk)**

Core

Crop Protection
Dissertation Project (Year 1)
Food Security, Agriculture and Climate Change
Research Dissertation (Year 2)
Sustainable Soil Management

Options

Behaviour of Pollutants in the Environment
Biological Effects of Air Pollution and Climate Change
Catchment Protection, Field Course
Conservation Biology
Contaminated Land and Remediation
Data Analysis and Interpretation
Environmental Management
Food Security and Environmental Issues in China (TBC)
Habitat Management
Numerical skills
Perspectives on Environment and Development
Pollution Microbiology
Sustainable Systems
Sustainable Water Management: Concepts Governance and Practice
Right to Adequate Food as a Human Right

MSc Sustainable Water Management

The MSc Sustainable Water Management course combines modules in hydrology, water quality and ecology together with a research project tailored towards developing skills relevant to starting a career in the UK water sector. These modules are taught by world experts in their field, including staff of the Centre for Ecology and Hydrology within the Lancaster Environment Centre.

The associated research project and work placements capitalise on our strong research links with organisations such as United Utilities, the Environment Agency, Defra and the UK Government Research Councils. Furthermore, as a member of this programme you become an associate member of the Centre for Sustainable Water Management and are invited to our research seminars and social activities.

Core

Catchment Protection Field Course
Dissertation Project
Flood Forecasting and Flood Risk Management
Groundwater Resources and Protection
Lake Ecology
Modelling Environmental Processes
Sustainable Water Management: Concepts, Governance and Practice

Options

Advanced Laboratory Methods for Environmental Sciences: Theory and Practice
Conservation Biology
Data Assimilation and Integration
Environmental Auditing
Environmental Informatics in Practice
Environmental Management
European and International Environmental Law
Food Security, Agriculture and Climate Change

Options (continued)

Geoinformatics
Geological Hazards
Habitat Management
Isotope Geochemistry in the Environment
Perspectives on Environment and Development
Renewable Energy
Sustainable Soil Management

MSc Volcanology and Geological Hazards

This unique MSc allows you to study amongst one of the largest groups of volcanologists and environmental scientists in the UK. Training in volcanology encompasses field, theoretical and laboratory components, with visits to study volcanic rocks in the nearby Lake District and a popular optional fieldtrip to Etna.

Taught modules cover the physical processes that generate volcanic and other geological hazards, together with hazard mitigation and management. Thanks to the broad choice of optional modules you can also study other environmental hazards such as flooding, and pick up useful transferable skills such as geoinformatics or modelling.

You will carry out your dissertation research alongside one of the many internationally-recognized experts in the LEC. The MSc is ideal preparation for PhD research, or work in the environment sector, and is suitable for students with a wide range of first degrees, including Geography, Geology, Environmental Science and Physics.

Mike Cassidy

"I came to Lancaster firstly for the excellent reputation of the Department and the masters course here. I also had some friends who studied here before who recommended the Department and University not to mention the close proximity to stunning scenery.

There was a large range of research topics to choose from and I found the taught modules very interesting and relevant. I gained useful training during the taught modules such as learning GIS and remote sensing, whilst also developing my writing and presentation skills.

I am now doing a PhD in the National Oceanography Centre in Southampton, researching the evolution of volcanism on Montserrat, West Indies. The scientific writing and communication skills I built up doing my dissertation, the connections I made throughout the course and the supervised research I carried out at Lancaster really helped me to progress to further postgraduate research."

STUDENT PROFILE

Core

Disaster Managment
Dissertation Project
Geological Hazards
Physical Volcanology

Options

Air Pollution and Climate
Chemical Risk Assessment
Climate Change and Society
Contaminated, Land and Remediation
Data Analysis and Interpretation
Data Assimilation and Integration
Environmental Applications of Isotope Geochemistry
Environmental Management
Environmental Radioactivity
Flood Forecasting and Flood Risk Management
Geoinformatics
Groundwater Resources and Protection
Modelling Environmental Processes
Volcanic Process Field Course

Research Projects

For taught masters schemes, half the course is devoted to a personal research project which the student carries out under the supervision of an academic member of staff. Each year we offer a very broad choice of projects covering the different aspects of our research, and many which involve external partners from industry or other research institutions, both within the UK and overseas. The projects are a chance for students to immerse themselves in a subject and carry out novel research with scientists who are leading experts in their fields. Projects can include fieldwork, experimental analysis in the laboratories, data analysis, and the learning of new skills which will enhance the career prospects of the student.

Joe Kinner

"For my master's project with LEC I was fortunate enough to collaborate with the University of Copenhagen, Denmark to research into groundwater-surface water interactions using geophysical techniques at Ringkøbing Fjord in West Jutland. The organizational effort of getting to the field site in Denmark all the way from Lancaster has definitely proved worthwhile over time. I firstly learnt so much more by having to train myself in the equipment before leaving LEC, and it felt great to know what to do as soon as I arrived at the field site. The professors and PhD students I was collaborating with were surprisingly easy to keep in contact with using email throughout the project and I felt my contribution of geophysics to their effort of understanding the hydrology of this area was highly valued."

To see examples of the breadth of projects on offer, view the current listings on:

http://www.lec.lancs.ac.uk/postgraduate/masters/research-projects.php

It may be possible for you to spend 3 months at one of our partner universities in mainland Europe, studying taught courses or undertaking research for your dissertation, through the Erasmus exchange programme. LEC currently has four Erasmus partners, in Switzerland, the Netherlands, Croatia and the Czech Republic. For further information please contact:

Dr Emily Heath, the LEC Erasmus Co-ordinator, e.heath@lancaster.ac.uk

In addition to projects we offer, we also encourage students to develop their own research agenda. Students begin to select and scope their projects from the outset of their masters and each year a healthy number of students publish their work in the peer reviewed literature.





Lancaster and the Local Area

Lancaster is one of Britain's top teaching and research universities. It is consistently ranked amongst the leading universities in the UK. Our well-equipped campus provides all of the University's academic, cultural and recreational facilities - 250 acres of beautiful parkland on the southern outskirts of the city. We are just three hours from London by train and less than 40 minutes away from the Lake District and Yorkshire Dales National Parks.

Our excellence in both teaching and research means you can expect the highest possible standards, and extensive laboratory, library and computing facilities are available to support your studies.

For postgraduates, the Graduate College provides social and sporting activities to foster community and a welfare network for non-academic needs. Our staff pride themselves on building relationships with every student so they can respond to their needs and help them both before and after they arrive. Students from all around the world choose to study with us, which means you'll make connections across the globe and learn from a wide range of other students' experiences.

Most postgraduate students at Lancaster University live on-campus in the purpose-built Graduate College, which has excellent accommodation for postgraduate students. Accommodation is also available off campus via LUSU Housing, Lancaster University's 'one-stop shop' for students wanting to live off-campus and provides access to some 400 accredited private rented properties in the city.

You'll never be short of things to do at Lancaster. Just a short bus ride away from the University is the city centre, home to bars, real ale pubs and nightclubs including the Students' Union's own Sugarhouse club. A number of galleries, museums, theatres, cinemas and music venues are located in the city, providing a wide range of opportunities for a break to your studies. Our college-based activities, sports and arts facilities, cinema, clubs and societies are also a great way to get involved and make the most of your time here.

Funding, Fees & Admission

Funding

Each year we have a number of studentships and bursaries available from the university and outside sponsors. Allocation of funds for these competitive scholarships are based on academic ability. Please note we are unable to make decisions on financial grounds. Further information is provided on the LEC postgraduate website, where you will also find information on other sources of funding.

Fees

Tuition fees are set by Lancaster University and announced in the spring of each year. Further information is provided on the LEC postgraduate website.

Applications

We welcome applications all year round. However, we recommend that you apply by July due to accommodation and visa deadlines. Please also be aware of any funding deadlines and ensure you apply for a place at Lancaster University in good time if an offer is required for your funding application.

Applicants to our taught masters degrees require a relevant, good first degree (normally 2:1 or equivalent). We can also consider applicants with a 2:2 (or equivalent) if they have relevant work experience (including voluntary work).

We also encourage applications from professionals who have relevant work-related qualifications but not necessarily a first degree. If you come from a non-standard background and would like advice on your eligibility for our programmes please get in touch with the LEC PG Office. E-mail: **lec.pg@lancaster.ac.uk**

Taught Masters can be studied over one year full-time or two years part-time.

Further information on making an application, including what you need to provide, is on the LEC postgraduate website, as is the link to the Postgraduate online application service.

Open Days

At regular intervals throughout the year, we offer you the opportunity to visit LEC so that we can show you what we have to offer. A typical open day provides you with the chance to:

- **discuss the course with members of academic staff**
- **find out about potential funding sources**
- **tour the University campus including the Graduate College**
- **visit some of the facilities in the Lancaster Environment Centre, including the dedicated Masters study room**

Applicants attending our open days find them a very valuable experience and we encourage you to attend. To make a reservation please complete the booking form on our website.

Photo, J Jennings

Photo, J Jennings

Photo, J Jennings

Visiting Us

Approximate Travel Times (By Train)

Lancaster — London	**2.5 hours**
Lancaster — Liverpool	**1.5 hours**
Lancaster — Manchester	**1 hour**
Lancaster — Edinburgh	**2 hours**

For further information about Taught Masters Programmes at LEC please contact:

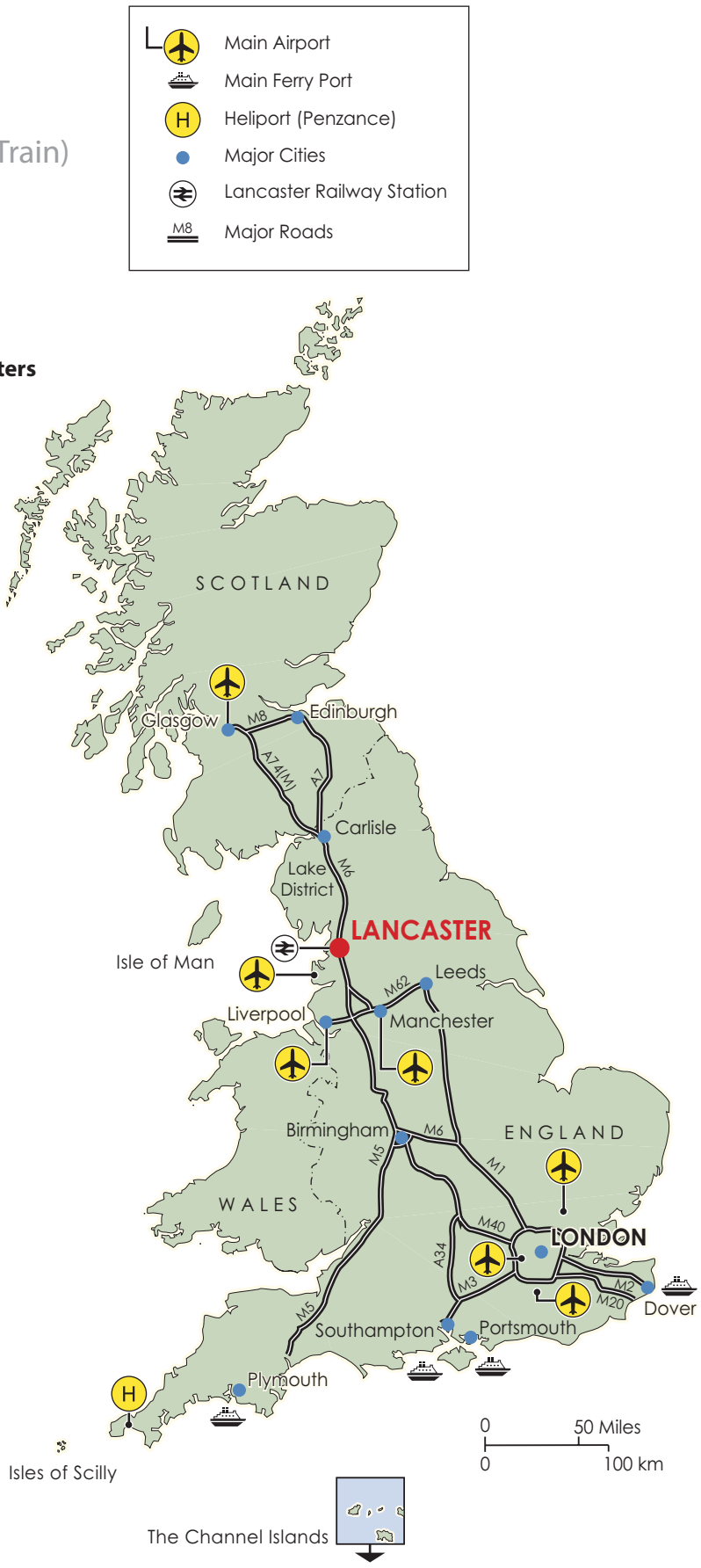
LEC Postgraduate Office
Lancaster Environment Centre
Lancaster University
LANCASTER
LA1 4YQ
United Kingdom

e lec.pg@lancaster.ac.uk
t +44 (0)1524 510257
w http://www.lec.lancs.ac.uk/postgraduate

For further information on making an application please contact:

Postgraduate Admissions
Faculty of Science and Technology
Lancaster University
LANCASTER
LA1 4YR

e fst-pg-admissions@lancaster.ac.uk
t +44 (0)1524 593795
w https://www.postgraduate.lancs.ac.uk



Disclaimer

Earth image (front cover) courtesy of NASA

Taught **Masters Programmes**

www.lec.lancs.ac.uk



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