**MSc Environmental Pollution**

The programme structure consists of a mixture of core taught modules (120 credits worth) reflecting the highly vocational nature of the programme, and an independent research project (60 credits worth). Together these components comprise a total of 180 credits that students are required to take at MSc level. Our current modules are:

### Programme Overview

<table>
<thead>
<tr>
<th>Module</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pollutant Behaviour in the Environment</td>
<td>20</td>
</tr>
<tr>
<td>Environmental Consultancy</td>
<td>20</td>
</tr>
<tr>
<td>Environmental and Pollution Microbiology</td>
<td>10</td>
</tr>
<tr>
<td>Laboratory analysis of Soils and Pollutants</td>
<td>10</td>
</tr>
<tr>
<td>Air Pollution: Effects and Control</td>
<td>20</td>
</tr>
<tr>
<td>Quantitative Analysis of Environmental Data</td>
<td>10</td>
</tr>
<tr>
<td>Waste and Environmental Management</td>
<td>10</td>
</tr>
<tr>
<td>Field Class</td>
<td>10</td>
</tr>
<tr>
<td>Skills for Independent Learning</td>
<td>10</td>
</tr>
<tr>
<td>Research Project</td>
<td>60</td>
</tr>
</tbody>
</table>

### Detailed Module Outlines

**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:** This module aims to provide 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 objectives of, and strategies for, the remediation of contaminated sites.

**Assessment:** Essay and written reports.

**Environmental Consultancy**

**Module Convenor:** Dr Elizabeth Shaw

**Description:** In this module you will undertake a practical site investigation on a former landfill. The results of the field sampling are used to develop a risk assessment of the site. The findings are presented to an expert panel under realistic conditions. Students benefit from a real life environment that provides genuine field experience that can be presented to future employers.
**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. The course will also provide students with examples of the benefits of managing soil microorganisms for bioremediation, plant growth promotion, and environmental sustainability. The associated practical work will provide students with practical experience of measuring, isolating and testing examples of soil microorganisms and quantifying some microbially-mediated processes.

*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 reports.

**Laboratory Analysis of Soils and Pollutants**

*Module Convenor:* Dr Elizabeth Shaw

*Description:* This module develops your laboratory and reporting skills. Over the course of 10 practical classes you will develop knowledge of the main analyses which are applied to soils to determine properties pertinent to the fate and behaviour of pollutants. You will also undertake a number of tests that are used to assess the concentration and bioavailability of a suite of contaminants in polluted soils. This module provides practical experience of techniques introduced and applied in GVMPBE.

*Aims:* To provide students with the skills required to analyse key soil properties related to pollutant fate. To gain experience analysing organic contaminants and potentially toxic elements in environmental samples. To introduce good laboratory practice and the importance of care for health protection and precise results. To develop good reporting and record keeping in the laboratory. To improve understanding of the relationships between soil properties and pollutant fate.

*Assessment:* Practical skills assessment and written report.

**Air Pollution: Effects and Control**

*Module Convenor:* Dr Hong Yang

*Description:* This course examines the effects and control of air pollution, enabling students to understand the issues and give them a basis for evaluating the controversies. The module will cover the history of air pollution, the “classical” air pollutants – sulphur dioxide and smoke; nitrogen oxides and particulates; ozone and other secondary pollutants; carbon dioxide and
other greenhouse gases; acid rain; indoor air pollution and air pollution in Asia. Current controversies about urban air pollution and the role of traffic, such as “Dieselgate” will be discussed in detail. The module will also examine the management of air pollution: how decisions are made and what legislation is in force. A visit to a monitoring site or industrial installation will be included if possible.

**Aims:** To promote an understanding of the nature and effects of human-induced air pollution; to assess some current controversies on the effects of air pollutants and the appropriate control measures to be applied, and to understand the interface between science and politics in coming to decisions about air pollution.

**Assessment:** Essay, Written report and oral presentation.

---

**Quantitative Analysis of Environmental Data**

**Module Convenor:** Dr Shovonlal Roy

**Description:** Quantitative data analysis is essential for Environmental Science. These practical skills increase our understanding of natural environmental processes and the impact of human activity on the environment (e.g. pollution and land management) through the analysis of data collected during practical investigations. This module will provide an overview of commonly used statistical and graphical techniques for environmental data analysis. Students will have the opportunity to design simple experiments, collect and analyse their own data, as well as analyse real data sets provided from different environmental research studies.

**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.

---

**Waste and Environmental Management**

**Module Convenor:** Dr Steve Robinson

**Description:** Through a combination of lectures and site visits, this module aims to develop the student’s understanding of the principles and practice of waste production and management. The lectures include contributions from external speakers on a range of technical and political challenges facing the waste industry.

**Aims:** To provide students with an understanding of the origin and composition of a variety of industrial and domestic organic and inorganic wastes, their treatment and disposal. Students will gain an understanding of the needs of the user-community in relation to soils and the wider environment. The course will provide students with an understanding of the various ways in which underlying principles are applied to the management of environmental issues in the commercial world.

**Assessment:** Essay and Written report.

---

**Field Class**

**Module Convenor:** Dr Tom Sizmur
Description: This module provides field examples of problems discussed during the teaching terms of Environmental Management and Environmental Pollution. You will obtain further hands on experience of monitoring and assessing environmental issues e.g. waste, contaminated land, water quality, and sustainable land management. The class runs from Sunday to Friday during the Easter vacation.

Aims: This module aims to provide you with the practical skills to identify, document, and evaluate the impact of human activities on the environment in the field.

Assessment: Written Assignments, Field notebook.

Skills for Independent Learning

Module Convenor: Dr Elizabeth Shaw

Description: Through seminars, tutorials and coursework, this module is designed to provide training in the skills required to study and research at postgraduate level.

Aims: The module aims to make students aware of the academic standards and integrity expected at postgraduate level and to provide training in study skills required for independent learning in taught and research project modules.

Assessment: Written assignments and set exercise.

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 Pollution, is intended to provide training in the skills required to devise, carry out and report a research project.

Assessment: Literature review and dissertation.