

PROGRAMME SPECIFICATION

This document describes the **Master of Science in Environmental Diagnosis and Management**. This specification is valid for new entrants from **September 2011**.

The aims of the programme are:

- To provide a wide range of practical training, transferable skills and scientific knowledge and understanding to enable graduates to have successful careers within environmental consultancies and engineers, local and regulatory authorities, industry, research institutes and academia.
- To emphasise practical, scientific and quality aspects of the diagnosis (ie analysis and assessment) and management (ie remediation and restoration) of environmental issues concerned with contaminated land, water quality, air pollution and waste management.

The programme is delivered over 52 weeks of full-time study or over 104 weeks of part-time study via a flexible block-release scheme. It is designed for recent science and engineering graduates, and for those in their early- and mid-careers with working experience, who wish to begin or advance careers in the environmental sector, or to pursue scientific research. Teaching focuses on producing professional environmental research scientists and managers via a combination of interactive lectures and small group work, a wide range of case studies and study visits, much practical hands-on laboratory- and field-work, and teambuilding.

Graduates possess a wide range of practical and transferable skills and scientific knowledge necessary to become leading experts in their chosen careers within environmental consultancies and engineers, local and regulatory authorities, industry, research institutes and academia. Indeed, with recent implementations of the EU and UK Contaminated Land Regulations, Landfill Directive, Water Framework Directive, and Air Quality Strategy, plus the development of the 2012 Olympics site in London, employment prospects within the environmental sector remain very good.

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This document provides a summary of the main features of the programme, and of the outcomes which a student might reasonably be expected to achieve if full advantage is taken of the learning opportunities provided. Further information is contained in the College prospectus, the College Regulations and in various handbooks issued to students upon arrival. Whilst Royal Holloway keeps all its information for prospective applicants and students under review, programmes and the availability of individual courses are necessarily subject to change at any time, and prospective applicants are therefore advised to seek confirmation of any factors which might affect their decision to follow a specific programme. In turn, Royal Holloway will inform applicants and students as soon as is practicable of any substantial changes which might affect their studies.

Learning outcomes

Teaching and learning in the programme are closely informed by the research activities and professional contacts of Departmental teaching staff, and by the professional vocational experience of leading experts from environmental consultancies and engineers, local and regulatory authorities, industry, and universities and research institutes, who contribute to the design and delivery of the programme. These experts are invited to teach and present seminars at RHUL; they also host several study visits and co-supervise research projects in their own working environments.

Knowledge and understanding

Students should also have acquired hands-on practical experience, advanced scientific knowledge and critical understanding of:

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- Sources and sinks of a wide range of environmental inorganic, organic and radionuclide pollutants;
- Sampling strategies, preparation procedures and quality assured analytical systems for environmental inorganic, organic and radionuclide pollutants;
- Principles, applications and relative merits of a wide range of analytical methods for environmental inorganic, organic and radionuclide pollutants;
- Applications of statistical analysis of environmental data;
- Principles and applications of Geographical Information Systems to interpret and illustrate environmental data;
- Principles and applications of Environmental Impact Assessment;
- Sources and sinks of inorganic, organic and radionuclide contaminants in soil and surface deposits, and their impacts on health;
- Health risk-based, source-receptor-pathway approaches to diagnose and manage contaminated land: desk-top study, conceptual model, site investigation, quantitative risk assessment, remediation and validation;
- Roles of aquatic chemistry, biology, ecology, geology and hydrology in the diagnosis and management of the quality of surface and groundwater;
- Biological and chemical methods to assess the quality of surface and groundwater, and to purify water and treat wastewater;
- Origins, diagnosis and management of environmental, ecological and economic issues that affect indigenous fauna, flora and residents of South Florida;
- Biological, chemical and physical analyses of water quality, ecological surveys, and pollutant source-receptor pathways;
- Sources, dispersion and conversion of natural and man-made gaseous and particulate air pollutants, and their impacts on climate change, health and vegetation;
- Diagnosis and management of air quality within the EU and UK;
- Monitoring strategies, sampling and analysis methods, the work up, analysis and interpretation of data, and the management of air quality issues for range of ambient and indoor air pollutants and greenhouse gases;
- Reprocessing, diagnosis, management, utilisation and storage of municipal, industrial and nuclear waste within the constraints of national and international legislation;
- Independent environmental science research of significant value to their career development.

Skills and other attributes

After taking the programme, students should have acquired hands-on practical experience, advanced scientific knowledge and critical understanding to enable them to:

- Conduct themselves as skilled, trained and knowledgeable professional environmental research scientists, consultants, legislators and managers;*
- Convey scientific, technical and managerial information to specialists and non-specialists through a variety of communication media in a professional manner;*
- Manage themselves, their colleagues and projects efficiently, and become an effective team member.*

* transferable skills

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Teaching, learning and assessment

The programme focuses on producing professional environmental research scientists and managers. Teaching and learning is highly interactive, and occurs via a combination of lectures and small group work, seminars and tutorials, a wide range of case studies and study visits, much hands-on practical laboratory and fieldwork, and teambuilding. In addition, there is a variety of assessed work including verbal and written reports, examinations, posters, PC-based exercises, and an independent research project, all with significant verbal and/or written feedback.

The emphasis throughout the programme is on practical and scientific environmental diagnosis and management of environmental issues of contaminated land, water quality, air pollution, and waste management. There is also much interaction with leading experts from environmental consultants,

industry, local and regulatory authorities, industry and universities, who teach, present seminars, host several study visits and co-supervise research projects.

Assessment is made in several ways:

Written examinations comprising two 2-hour papers take place at the end of the first and second terms. They are designed to test understanding of the principles and concepts taught in the modules delivered during those terms, and the ability to integrate and apply them to issues of environmental diagnosis and management.

Module work and practical computing, laboratory, and field work exercises are assessed to evaluate applications of the environmental science taught, written and verbal communication skills and mastery of computing software. Assessment also reflects the ability to work independently, in pairs, in small groups or as a class, and to learn interactively during the study visits.

The research project represents the final integration and application of the knowledge, training and skills learned. The assessment of the research project is based on the ability to plan, co-ordinate, carry out and report on an original piece of independent scientific work.

Full details of the assessment for individual courses can be obtained from the [Department](#).

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Details of the programme structure(s)

The full-time programme lasts 52 weeks, beginning in September and consists of the following four elements:

(i) EA 5110: Environmental Diagnosis (Autumn Term)	(22%)
(ii) EA 5220: Environmental Management (Spring Term)	(20%)
(iii) EA 5430: Case Studies (Autumn and Spring Terms)	(18%)
(iv) EA 5500: Independent Research Project (Summer)	(40%)

Part-time programme structure

The part-time programme lasts 104 weeks, beginning in September of year one. Part-time students normally take combinations of parts of elements (i), (ii), and (iii) in their first and second years, and all of element (iv) in their second year.

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Progression and award requirements

The award of Pass requires a mark of at least 50.0% in all course elements which count towards the final assessment. A failure mark of between 40.0-49.0% can be condoned if the work does not constitute more than 25% of the final assessment, provided that the overall weighted average is at least 50.0%. A failure mark of below 50.0% in the research project cannot be condoned.

The award of Merit requires an outcome of Pass (ie at least 50.0%) in all course elements which count towards the final assessment, and a weighted average of 60.0% or above in the final assessment.

The award of Distinction requires a mark of at least 60.0% in all course elements which count towards the final assessment, and a weighted average of 70.0% or above in the final assessment. Candidates taking more than one attempt at any course element counting towards the final assessment will not be considered for the award of Distinction.

A candidate who has been received an outcome of Fail in one or more assessed elements will receive an outcome of Fail in the programme overall. The examiners may, at their discretion and with the agreement of the External Examiner, condone a mark of Fail in one element that constitute up to 25% of the final assessment, providing that the percentage score in the element is at least 40.0%.

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Student support and guidance

Student support and guidance is provided throughout the programme via a wide range of mechanisms:

- Students are assigned a Personal Advisor who is concerned for their academic progress and social well-being. Personal Advisors (and the Programme Director) may be consulted to discuss in confidence, academic, vocational or personal matters, and may be asked to provide a reference in support of applications for employment or further postgraduate research. Students may be advised to discuss certain matters with more appropriate members of staff. Module co-ordinators, teaching staff and research project supervisors may also be consulted.
- Free study periods are scheduled daily throughout the Autumn and Spring terms to encourage individual and group study, and teamwork. They also provide time for students to meet with their Personal Advisors, and to discuss with the Programme Director matters concerned with their academic progress, social well-being, and organisation of research projects.
- Open forum discussions allow the programme management team and the whole class to discuss together topics raised by both parties, and to provide each other with feedback. Topics discussed include teaching quality, coursework, research projects, study visits, and social events. Notes are distributed and actions expected to be realised by staff and students. These discussion meetings complement those of the departmental Staff-Postgraduate Student Liaison Committee.
- Tutorial sessions are scheduled in response to student requests for extra tuition in specific topics, and to student needs as perceived by the teaching staff. Upon request, written and/or verbal feedback is provided for each piece of assessed coursework, including examinations.
- Seminar speakers from environmental consultancies and engineers, local and regulatory authorities, industry, research institutes and academia present recent work and to discuss career opportunities and potential research projects. Graduates of the programme are invited to speak on the early development of their professional careers. Seminars are usually followed by professional networking and interaction with refreshments. Information on career opportunities and job vacancies within the environmental sciences is posted as it is received.
- A 1-week induction programme is provided to allow students to settle in, register on the programme and with the Library, and obtain an e-mail address. Also, students are invited to meet programme and departmental staff, and to join a wide range of Student Union clubs and societies. There are also health and safety briefings, introductions to key departmental technical and administrative personnel, and guided tours of computing and other laboratory facilities.
- Students are provided with a detailed Programme Handbook and course resources, with much information and learning material downloadable from the Web. Extensive supporting materials and learning resources are also available in the College and University libraries, and in the Computer Centre. The programme is delivered in dedicated departmental teaching laboratories, and in departmental and College computing facilities and research laboratories.
- Students have access to a College Careers Service and Departmental Careers Service Liaison Officer. They also have access to all College and University support services, including a comprehensive Health Centre, a vibrant Student's Union, a highly regarded Counselling Service, dedicated educational and special needs support within the Educational Support Office, together with a wealth of financial, career and other advice.
- Programme Representatives are elected by the class to liaise with the Programme Director and to organise social events. Representatives also serve on Department of Earth Sciences Staff-Postgraduate Student Liaison Committee. All students are welcome to participate in social events organised by the Student run Lyell Society, Postgraduate Students and the Department.

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Admission requirements

The programme is designed for recent science and engineering graduates, and for those in their early- and mid-careers with working experience, who wish to begin or advance careers in the environmental sector or to pursue scientific research.

Applicants should have a First- or Second-class Honours degree in a biological, chemical, earth, ecological, engineering, environmental, marine or physical science subject (or an equivalent international qualification), together with supportive references. Relevant work experience is ideal but not necessary. Applicants with strong professional experience and other qualifications should contact the Course Director for guidance. Students whose first language is not English may also be asked for a

qualification in English Language at an appropriate level. For further details please refer to the [Prospective Students](#) web page. It may also be helpful to contact the [Admissions Office](#) for specific guidance on the entrance requirements for particular programmes.

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Further learning and career opportunities

Graduates of the programme are trained professional environmental scientists and managers, with a wide range of practical and transferable skills and scientific knowledge and understanding. They are highly sought after by environmental consultancies and engineers, local and regulatory authorities, industry, research institutes and academia, with which the programme has strong links via contributions to teaching and research. Many graduates also choose to pursue PhD research at RHUL and other leading national and international universities.

In addition to the services offered by the College Careers Service, the Department has strong alumni links, while further links with employers are fostered through the Department's External Advisory Board. For more details on further learning and career opportunities please refer to the [Careers Service](#).

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Indicators of quality and standards

Royal Holloway's position as one of the UK's leading research-intensive institutions was confirmed by the results of the most recent Research Assessment Exercise (RAE 2008) conducted by the Higher Education Funding Council (HEFCE). The new scoring system for the RAE 2008 measures research quality in four categories, with the top score of 4* indicating quality that is world-leading and of the highest standards in terms of originality, significance and rigour. 60% of the College's research profile is rated as world-leading or internationally excellent outperforming the national average of 50%. The College is ranked 16th in the UK for research of 4* standard and 18th for 3* and 4* research. The Department of Earth Sciences was ranked joint 7th in the top 10 universities in the country in terms of proportion of 3* and 4* research, with 70% of its research profile being of 3* and 4* standard.

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List of programmes

The programme is taught by staff at Royal Holloway, University of London with invaluable interaction with leading experts from environmental consultants and engineers, industry, local and regulatory authorities, and universities and research institutes, who teach, present seminars, host several study visits, and co-supervise and manage research projects. The Masters leads to an award of the University of London. The Banner programme code is given in parentheses.

Master of Science in Environmental Diagnosis and Management

MSc in Environmental Diagnosis and Management (1114)

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