

## PROGRAMME SPECIFICATION

This document describes **MSci Honours Degree programmes in Geoscience**, with an option to undertake either a Year in Industry or a Year of International Study in an overseas university. This specification is valid for new entrants from **September 2016**.

The aims of the MSci Honours Degree programmes in Geoscience are:

- to provide a sound and extensive basis for the study of the Geological Sciences relating to the natural environment, meeting the requirements for programme accreditation by the Geological Society and the general requirements of the subject benchmarking statement;
- to provide students with knowledge of the science, and equip them with discipline-specific and transferable skills;
- to provide students with core knowledge and a range of key skills;
- to offer a range of specialist courses and research projects which allow students to develop expertise and research interests in their chosen field;
- to produce graduates who are equipped with knowledge and skills appropriate for careers in the Earth Sciences and other disciplines;
- to equip students to carry out independent advanced studies in the Earth Sciences;
- to provide an avenue for talented and motivated students to gain greater academic and cultural breadth in their degree by incorporating a year of study at an international university selected to complement their chosen area of study in Earth Sciences (for students following MSci Geoscience with a Year of International Study).

Programmes are delivered in four stages, each of which normally comprises one year of full-time study, during which the student must follow courses to the value of 120 credits. Although full-time attendance is the normal mode of study, in certain circumstances it may be possible to become study part-time and each stage of the programme over two years (60 credits per year). In this case there are no specific requirements in terms of the order in which the respective courses are taken. Please note, however, that the Year in Industry and Year Abroad programmes cannot be taken on a part time basis.

Courses are characterised by the provision of a broad base in skills and knowledge in stages one and two followed by opportunities for specialisation in stages three and four. The courses also have strong compulsory spines of fieldwork. Training in data collection, data analysis and presentation of reports is provided in core courses and independent project work is included in the final stage of the degree programme. Stage one courses follow a common core of four units which provide a broadly-based introduction to the subject, providing students with basic knowledge and understanding, discipline-specific skills, and transferable skills. Stage two contains eight core Earth Sciences courses; these are integrated courses in substantial areas of the discipline which form a bridge between the introductions provided in stage one and the research-led specialist options in stages three and four. These specialist courses are closely informed by the active research of staff and the needs of industry, particularly in the general areas of: Ancient and Modern Earth Systems (modern atmospheres, surface processes, palaeobiology, ancient Earth systems), Tectonics and Basins (sedimentology, mountain evolution, uplift, and erosion, numerical modelling, seismic interpretation, lithospheric and asthenospheric processes) and Geochemistry (palaeoceanography, crust-mantle evolution, plumes and ridges, volcanic arcs).

Students on the International Study programme spend stage three of their programme studying at a partner institution selected in consultation with the Programme Coordinator and College advisors. Students are encouraged to pursue courses that provide a different perspective on geological science, broaden their experience of practical geology, or provide instruction in subjects not taught as specialised courses at RHUL.

Students may also interrupt their formal studies and work for 9-12 months in an industrial or public-service laboratory on an approved programme of work in the general field of applied geology. Reports of the work undertaken will be assessed and contribute to the final award. In these cases the programme will last for 5 years.

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This document provides a summary of the main features of the programme(s), 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 programmes are closely informed by the active research of staff. In general terms, the programmes provide opportunities for students to develop and demonstrate the following learning outcomes:

#### *Knowledge and understanding of*

- the scientific, interdisciplinary study of the physical, chemical and biological processes operating on and within the Earth;
- the interaction of these processes in the consideration of the Earth as a dynamic system through time, (crust-mantle processes, surface processes, biosphere, atmosphere and hydrosphere);
- the structure and composition of the Earth;
- the study of geological materials (minerals, rocks, fluids);
- the use of geological maps to represent three-dimensional spatial variations and their interpretation in a temporal framework;
- the techniques of investigation in the geological sciences (geophysical, geochemical, remote sensing, geological data collection and analysis);
- the evolution of life and changing environments through the study of palaeobiology, palaeoecology, palaeoenvironmental and sedimentological analysis;
- geodynamic processes at the scale of local and global tectonics;
- stratigraphic principles and techniques (litho-, bio-, chrono- and sequence stratigraphy);
- the application of the Earth Sciences to resource exploitation (hydrocarbons, minerals, water), civil and environmental engineering (construction, waste disposal) and environmental hazards (earthquakes, volcanic eruptions, floods, landslides);
- the social and political role of the Earth Sciences in the exploitation and conservation of geological resources. (Advanced knowledge is gained in selected subject areas from optional courses taken in the fourth year and in-depth understanding of a topic developed in the context of independent research projects in the final year).

#### *Skills and other attributes*

The development of **intellectual skills** forms the basis of all the programmes. By achieving the learning outcomes specified for each course students will be able to:

- recognise and apply different theories, concepts and principles;
- develop a strategy for tackling a geological problem;
- collect and document different types of geological data using appropriate techniques and methodologies;
- apply appropriate numerical, statistical and instrumental techniques to the analysis of geological data;
- recognise applicable theories or formulate new hypotheses for the interpretation of geological information;
- carry out independent, innovative research into a topic and present the results to a professional standard.

**Practical skills** may be divided into those developed in the *laboratory* and those which are *field*-based. *Laboratory* skills focus on:

- the description and interpretation of specimens of rocks, fossils and minerals;
- the analysis and interpretation in time and space of structural and stratigraphic data presented as geological maps and the reduction and interpretation of remotely sensed and geophysical data;
- the use of appropriate techniques of data analysis for an independent research project;
- safe and effective practice in an analytical laboratory.

*Field* training is a core element of all degree programmes. The following aspects of skills development in the field are covered in stage one and two courses:

- the recording of a wide variety of geological and geophysical data (including structural, sedimentary and palaeontological) in a spatial and stratigraphic context;
- the collection of rocks, minerals, fossils and fluids in a safe, efficient and environmentally sensitive manner;
- the planning and execution of field work in a safe and considerate way, having due regard for all regulations covering health, safety and access rights; carrying out a hazard assessment.

There is a range of **transferable skills** that are integral to training in the geological sciences. Considerable emphasis is placed on the development of these skills to ensure that graduates of these programmes are equipped to use appropriate technology, communicate effectively and work effectively. These include:

- the attainment of a reasonable standard of numeracy;\*
- the use of appropriate computer technology;\*
- use of libraries and the retrieval of information from diverse sources;\*
- the ability to assemble information, analyse and synthesise results and present them in a variety of reporting formats including short, concise written reports, longer dissertations, presentation as posters and verbally in seminars;\*
- the ability to work independently on a research project;\*
- working in a team, setting goals by discussion, and sharing information and ideas to develop a collective outcome to a problem.\*

**Personal and social skills** are fostered in a general way as part of the degree programme. These include: personal motivation; the ability to work autonomously and with others; self-management; the ability to work towards and meet deadlines; intellectual integrity; awareness of responsibility; interest in lifelong learning; flexibility and adaptability; creativity.\*

\* transferable skills

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### Teaching, learning and assessment

A progression of knowledge and understanding is achieved by starting with a basic grounding, which is subsequently reinforced and developed through application to specialist topics. Practical classes comprise 60% of the timetabled study time, reflecting the emphasis on learning through studying maps, rocks, minerals, fossils and classwork exercises. Lectures are used to introduce material and provide a context for private study. Tutorials supplement and reinforce knowledge and understanding. A comprehensive field programme provides opportunities for students to apply concepts developed in the classroom and lecture theatre and is considered to

be a fundamental aspect of the teaching programme. Field and laboratory project work carried out as individuals or in teams represents an opportunity for students to develop in-depth knowledge of specialist areas.

Transferable, laboratory and field skills are identified within the learning outcomes of course units and summarised in a skills progression chart in the undergraduate handbook. A progression of skills development is provided through the introduction of most basic skills in stages one and two, a core course of Advanced Concepts and Techniques in Geology in stage three, and the opportunity to apply skills to specialised areas in stages three and four. Assessment of skills, knowledge and understanding is by means of formal examinations, coursework practical exercises, literature research reports, fieldwork exercises and reports, oral presentations and independent dissertations. Full details of the assessments for individual courses can be obtained from the [Department](#).

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### **Details of the programme structure**

Please note that not all courses run each year. A full list of courses including optional courses for the current academic year can be obtained from the [Department](#).

#### MSci Degree programmes in Geoscience

##### **Stage one:**

Students must take the following **mandatory** courses:

GL1100 Global Tectonics (15 credits)

GL1200 Introductory Sedimentology (15 credits)

GL1460 Igneous and Metamorphic Geology (15 credits)

GL1500 Physics and Chemistry of the Earth (15 credits)

GL1600 Earth Structures (15 credits)

GL1900 Scientific and Geological Field Skills (15 credits) non condonable

GL1800 Introductory Palaeontology (15 credits)

and either

GL1300 Environmental Issues with Maths (15 credits)

or

GL1750 Petroleum Geology with Maths (15 credits)

##### **Stage two:**

Students must take the following **mandatory** courses:

GL2200 Stratigraphy and the History of Life (15 credits)

GL2210 Regional Geology (15 credits)

GL2400 Igneous and Metamorphic Geology (15 credits)

GL2410 Geochemistry (15 credits)

GL2901 Advanced Scientific and Geological Field Skills (30 credits) non condonable

and choose courses to the value of 45 credits from:

GL2230 Sedimentary Basin Analysis (15 credits)

GL2320 Geohazards (15 credits)

GL2500 Applied Geophysics (15 credits)

GL2520 Computational Earth Sciences (15 credits)

GL2600 Structural Analysis and Remote Sensing (15 credits)

Students may also choose to take:

GL3141 Applied Geology (Industrial Placement) (30 credits) in addition to final year courses. This is a 9-12 month work experience placement, normally between stages three and four and leads to the MSci with a Year in Industry degree. Students will be assessed on 150 credits during the final stage of the programme.

### **Stage three:**

Students must take the following **mandatory** courses:

GL3001 Advanced Concepts and Techniques in Geology (30 credits)

GL3901 Independent Geological Field Mapping (30 credits) non condonable

and choose options equal to the value of 60 credits from a list of Stage three courses offered by the [Department](#).

Students following MSci Geoscience with a Year of International Study must instead take a selection of courses equivalent to a full academic year of study at an institution overseas; choice of courses is carried out under the guidance of the Programme Coordinator. Students following MSci Geoscience with a Year of International Study are also required to complete an independent field mapping project during the senior stages of their study. This requirement is normally split equally between Year 3 (GL3920) and Year 4 (GL4920).

### **Stage four:**

Students must take the following **mandatory** course:

GL4012 Independent Geoscience Project (60 credits) non condonable

and choose options equal to the value of 60 credits from a list of Stage four courses offered by the [Department](#). In lieu of some of the options, students may take courses from Stage four of the MSci Environmental Geoscience.

Part-time students must take courses to the value of 60 credits each year.

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## **Progression and award requirements**

The [College's Undergraduate Regulations](#) include full details on progression and award requirements for all undergraduate programmes offered by the College. Please note that there specific progression requirements for the MSci degree.

Additionally, GL1900 must be passed in order to progress from the first to second stage. GL2901 must be passed in order to progress from the second to third stage. GL3940 Methods of Environmental Investigation must be passed at the first attempt for progression to the final stage of the MSci. GL4920 must be passed to qualify for the MSci award.

Students on the Year in Industry programme must pass GL3141 Applied Geology (Industrial Placement) in order to qualify for the degree title of MSci Geoscience with a Year in Industry.

Students on the International Year programme must pass GL3920 in order to qualify for the degree title of MSci Geoscience with an International Year.

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## **Student support and guidance**

- **Personal Advisers:** All students are allocated a personal adviser who meets with them regularly through the programme. The personal adviser's role is to advise on academic, pastoral and welfare issues. Students may choose to be allocated a different personal adviser at any stage during the programme. Students following the MSci Geoscience with a Year of International Study are allocated a personal adviser who has direct knowledge of international university education, and can therefore provide a valid perspective and first-hand advice on international study.
- Degree Programme coordinators and the Academic Coordinator provide a back-up system of academic, pastoral and welfare advice.
- All members of staff are available and accessible during office hours.

- Detailed student handbook and course resources, provided via the Web where appropriate.
- Representation on the Student-Staff Committee.
- Extensive supporting materials and learning resources in College and University libraries and Computer Centre.
- Dedicated departmental teaching-laboratories and computing facilities.
- College Careers and Employability Service and Departmental Careers and Employability Tutor.
- Access to all College and University support services, including Student Counselling Service, Health Centre, Students' Union and the Disability and Dyslexia services for students with disabilities and Specific Learning Difficulties.

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### **Admission requirements**

Details of the Department's typical offer for each programme of study is available on the [Course Finder](#) web page. However, the Department also has considerable flexibility in its admissions and offers policy and strongly encourages applications from non-standard applicants. Students whose first language is not English may also be asked for a qualification in English Language at an appropriate level. For further guidance it may be helpful to contact the [Recruitment and Partnership Office](#).

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### **Further learning and career opportunities**

Graduates from Earth Sciences degree programmes have successfully progressed into a wide range of professions, while some have continued onto Postgraduate studies. In addition to the services offered by the College Careers Service, the Department has strong alumni links. Links with employers are fostered through the Department's External Advisory Board. The following Masters programmes are available within the Department: MSc Petroleum Geoscience, MSc Environmental Diagnosis and Management, MSc Earth Sciences by Research, and there is also the relevant MSc in Quaternary Science in the Department of Geography. The degree programmes are accredited by the Geological Society of London as a pathway to professional status for graduates. For further details 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 Excellence Framework (REF 2014) conducted by the Higher Education Funding Council (HEFCE). The scoring system for the REF 2014 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 and 3\* indicating research that is internationally excellent. 81% of the College's research profile was deemed to be within the 4\* or 3\* categories, an increase of over 20% since 2008. This results for the quality of our research outputs placed Royal Holloway 15<sup>th</sup> in the UK based on an overall Grade Point Average (GPA) score and 20<sup>th</sup> in the UK for 4\* and 3\* research. The Department of Earth Sciences is ranked 14 in the UK for research of 4\* standard and 2 for 3\* and 4\* research and is ranked within the top 5 departments for their subject in the UK.

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### **List of programmes**

All the programmes are taught by staff at Royal Holloway, University of London, and lead to awards of the University of London. Single honours programmes in Earth Sciences are subject to accreditation by the Geological Society of London and the aims and outcomes reflect this. The QAA subject benchmark statements in Earth Sciences, Environmental Sciences and Environmental Studies describe the general features which one might

expect from Honours Degree programmes in the subject, and can therefore be used as a point of reference when reading this document (see [www.qaa.ac.uk](http://www.qaa.ac.uk)). UCAS codes are given in parentheses (see [www.ucas.ac.uk](http://www.ucas.ac.uk)).

### **MSci Degree programmes in Geoscience**

MSci Geoscience (F601)

MSci Geoscience with a Year of International Study (F602)

MSci Geoscience with a Year in Industry (F642)

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