ROYAL HOLLOWAY
University of London

PROGRAMME SPECIFICATION

This document describes the **Joint Honours Degree programme in Planetary Geology**. For Combined and Joint Honours Degree programmes, please also refer to the equivalent document(s) for the other subject(s). This specification is valid for new entrants from **September 2006**.

The aims of the Joint Honours Degree programme in Planetary Geology are:

- to provide a sound and extensive basis for the study of Earth and Planetary Sciences;
- to provide students with core knowledge of the science, and equip them with a range of discipline-specific, key and transferable 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 and Planetary Sciences as well as other disciplines.

The programme is delivered in three stages, each of which comprises one year of full-time study during which the student must follow courses to the value of four units (one unit is equivalent to 30 national credits). It is characterised by the provision of a broad base in skills and knowledge in stage one and two followed by opportunities for specialisation in stage three. The programme also has a strong compulsory spine 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 year of the degree programme.

Teaching and learning in the programme are designed to provide graduates with a sound basis of knowledge and skills in Earth and Planetary sciences and aim to cover the range of skills and knowledge required by a professional geologist. Programmes run jointly or in collaboration with other subject areas seek to provide an integrated education in relevant areas of each subject. Specialist courses offered in the stage three are closely informed by the active research of staff, 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).

Further information

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 programme 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 and other planets;

- the interaction of these processes in the consideration of planets as dynamic systems through time, (crust-mantle processes, surface processes, biosphere, atmosphere and hydrosphere);
- the structure and composition of the Earth and other planets;
- 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 techniques of investigation in the physical sciences (mathematical, theoretical, experimental and observational);
- geodynamic processes at the scale of local and global tectonics;
- stratigraphic principles and techniques (litho-, bio-, chrono- and sequence stratigraphy);
- modern physics and its impact on our understanding of the universe, our solar system and our planet;
- planetary geology.

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:

- develop a strategy for tackling a scientific problem;
- collect, document and analyse different types of data using appropriate techniques and methodologies;
- synthesise data and information, and recognize or formulate hypotheses for the interpretation of this information;
- recognise the importance of applying professional standards in scientific work.

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 rocks and minerals in hand specimen or through the use of a petrological microscope;
- the analysis and interpretation in time and space of structural and stratigraphic data presented as geological maps;
- reduction and interpretation of geophysical and other remotely sensed data;
- the design and analysis of physical experiments in a safe and effective manner;

Field training is a core element of all degree programmes. The following aspects of skills development in the field are covered in first and second year courses:

- the recording of relevant geological data in spatial context;
- the collection of rocks, minerals, fossils and fluids in a safe, efficient and environmentally sensitive manner;

There is a range of **transferable skills** that are integral to training in the 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 certain standards of numeracy;*
- the ability to use appropriate computer technology and communication using the internet;*
- the use of libraries and the retrieval of information from diverse sources;*
- the ability to assemble information, analyze and synthesize results and present them in a variety of reporting formats including short written reports, longer dissertations and presentation as posters and oral presentations;*
- 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

The learning outcomes are embedded within the core and optional courses available to the students. 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. In stages one and two, different aspects are taught in an interrelated, interdependent way; the continuum of the subject matter being broken only for the purposes of assessment as whole or half course units. In stage three, specialist topics are more self-contained. Practical classes comprise 60% of the timetabled study time, reflecting the emphasis on learning through studying maps, rocks and class work exercises. Lectures are used to introduce material and provide a context for private study. Tutorials supplement and reinforce knowledge and understanding. An appropriate 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 summarized in a skills progression chart in the undergraduate handbook.
Assessment of skills, knowledge and understanding is by means of formal examinations, coursework practical exercises, literature research reports, fieldwork and laboratory exercises and reports, oral presentations and independent dissertations. Independent research projects in stage three provide opportunities to develop and integrate a wide range of discipline-specific and transferable skills and students are encouraged to regard these as an important forum for demonstrating their abilities. Full details of the assessments for individual courses can be obtained from the Department.

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Details of the programme structure(s)
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.

Stage one:
Students must take:
GL1021 Introduction to Earth Sciences for Joint Honours (1 unit)
GL1141 Foundation Geology for Joint Honours (1 unit)
PH1110 Mathematics for Scientists (½ unit)
PH1140 Scientific Skills 1 (½ unit)
PH1310 Dynamics, Forces and Waves (½ unit)
PH1910 The Structure of the Universe (½ unit)

Stage two:
Students must take:
GL2410 Geochemistry (½ unit)
GL2600 Structural Analysis and Remote Sensing (½ unit)
GL2900 Field Methods in Geology (½ unit)
GL2510 Planetary Geology (½ unit)
PH1120 Mathematics for Scientists 2 (½ unit)
PH1530 Relativity and Quantum Physics (½ unit)
PH1620 Structure of Matter (½ unit)
PH2900 Astronomy (½ unit)

Stage three:
Students must take:
GL3131 Independent Project (1 unit)
GL3520 Planetary Frontiers (½ unit)

And choose options to the value of a half unit from a list of Stage three courses offered by the Department. In addition, specified courses to the value of 2 units will be taken in the Physics Department.

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Progression and award requirements
The progression and award requirements are essentially the same across all Honours Degree programmes at Royal Holloway. Students must pass units to the value of at least three units on each stage of the programme. On some programmes there may be a requirement to pass specific courses in order to progress to the next stage, or to qualify for a particular degree title. Students are considered for the

award and classified on the basis of a weighted average. This is calculated from marks gained in courses taken in stages two and three, and gives twice the weighting to marks gained in stage three. In order to qualify for the award, students must pass courses to the value of at least nine units, three of which must be taken in the stage three and also gain a weighted average of at least 35%. In Planetary Geology, there are no compulsory courses (which must be passed to allow progression), but there are core courses in all years for which students must register and complete (see programme structure above).

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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.
- Joint and Combined students are assigned a tutor in both departments who liaise over the tutorial programme, ensuring a balanced workload and coverage of material.
- 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 Service and departmental Careers Service liaison officer.
- Access to all College and University support services, including Student Counselling Service, Health Centre, Students' Union and the Education Support Office for students with special needs.

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Admission requirements

The Department's standard conditional offer is available on the Course Catalogue 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. 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 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. Petroleum Geoscience (Basin Evolution and Dynamics), MSc Petroleum Geoscience (Tectonics), MSc Environmental Diagnosis and Management, MSc Geology by Research, and there is also the relevant MSc in Quaternary Science in the Department of Geography. The degree programme is 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 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, and leads to an award of the University of London. Programmes in Earth Sciences (with the exception of the joint degrees with Biology and Mathematics) 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). UCAS codes are given in parentheses (see www.ucas.ac.uk).

Joint Honours Degree programmes with Earth Sciences as an equal component

BSc Planetary Geology (FF65)*

* Not available to new entrants.

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