ROYAL HOLLOWAY
University of London

PROGRAMME SPECIFICATION

This document describes **Honours Degree programmes in Digital Geosciences** .This specification is valid for new entrants from September 2017

The aims of the BSc Digital Geosciences are:

1. to study the interaction of physical, chemical and biological processes relating to the Earth as a dynamic system through time (crust-mantle processes, surface processes, biosphere, atmosphere and hydrosphere);

2. to examine geological materials (minerals, rocks, fluids) and the use of geological maps to represent three-dimensional spatial variations and their interpretation in a temporal framework;

3. to consider the application of earth sciences and its social and political role to resource exploitation (hydrocarbons, minerals, water), civil and environmental engineering (construction, waste disposal) and environmental hazards (earthquakes, volcanic eruptions, floods, landslides);

4. to use open source programming language to analyse digital geological data, create computer based models of geological processes, and generate and modify digital geological field maps;

5. to learn about managing a research project including identification of milestones, time and resource management, and feasibility demonstration.

The BSc Digital Geosciences 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 120 credits. Although full-time attendance is the normal mode of study, this programme is also available in part time mode, whereby students would normally take 60 credits per year.

The programme also has a strong compulsory spine of fieldwork including a specialised project in Digital Geosciences in the second year and culminating in an independent mapping project in the final year. Training in data collection, data analysis and presentation of reports is provided in core courses along with a range of transferrable skills that contribute to the successful progression of Earth Science graduates into a wide range of careers. Teaching and learning in the programme are designed to provide graduates with a sound basis of knowledge and skills in the geological sciences akin to those required by a professional geologist. Specialist courses offered in 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

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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 programme are closely informed by the active research of staff, particularly in the areas of physical, chemical, and biological Earth processes; examination of geological materials; and application of Earth Sciences to resource exploration and environmental engineering. In addition, the student will also learn scientific computing using open source programming languages, prepare independent project proposals, and carry out independent research projects. In general terms, the programmes provide opportunities for students to develop and demonstrate the following learning outcomes:

- A strong understanding of interaction of physical, chemical and biological processes relating to the Earth as a dynamic system through time
- A strong understanding of the internal structure of the Earth and the link between deep Earth processes and surface processes
- Understanding the origin of different geological materials, and ability to identify the source of these materials based on their characteristics
- Basic knowledge of computer scripting languages such as MATLAB or python to manipulate geological data, carry out basic digital data analysis, and create digital data using basic geological models
- Some knowledge of creating and editing digital geological maps and carry out independent research project involving digital geological data
- *The students will be trained in the application of earth sciences and its social and political role to resource exploitation (hydrocarbons, minerals, water), civil and environmental engineering (construction, waste disposal) and environmental hazards (earthquakes, volcanic eruptions, floods, landslides). This training will prepare the students for future employment opportunities in energy and environmental sectors, Government geological surveys, and positions related to environmental and scientific policy making.
- *The students will also learn programming in high level computer languages, a skill set that they can use to find positions in the software industry.

* Transferable skills

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Teaching, learning and assessment

Teaching and learning is mostly by means of lectures, seminars, essay consultations, oral presentations, fieldwork, practicals, and guided independent study. Assessment of knowledge and understanding is typically by formal examinations, coursework, assessed essays, practical exercises, assessed project proposals, oral presentations, assessed fieldwork, and independent research projects. In addition, students may be involved in workshops and may produce various forms of creative work. 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.

Credit values are listed in brackets at the side of each course unit.

BSc Digital Geosciences

Stage one:
Students must take the following mandatory courses:

GL1100: Global Tectonics (15 credits)
GL1200: Introductory Sedimentology (15 credits)
GL1460: Igneous and metamorphic petrology (15 credits)
GL1500: Physics and Chemistry of the Earth (15 credits)
GL1600: Earth Structures (15 credits)
GL1800: Introductory Palaeontology (15 credits)
GL1900: Scientific and Field Skills (15 credits) non-condonable

And one of the following:
GL1300: Environmental Issues with Maths (15 credits)
GL1750: Introduction to Petroleum Geology with Maths (15 credits)

Stage two:
Students must take the following mandatory courses:
GL2210: Regional Geology (15 credits)
GL2500: Applied Geophysics (15 credits)
GL2520: Computational Earth Sciences (15 credits) non-condonable
GL2550: Independent Research in Computational Geosciences (15 credits) non-condonable

and choose any 4 optional courses equal to the value of 60 credits from the following:
GL2600: Structural Analysis and Remote Sensing (15 credits)
GL2200: Stratigraphy and History of Life (15 credits)
GL2251: Sedimentary Basin Analysis (15 credits)
GL2320: Geohazards (15 credits)
GL2400: Igneous and Metamorphic Petrology (15 credits)
GL2410: Geochemistry (15 credits)

Stage three:
Students must take the following mandatory courses:

GL3001: Advanced Concepts and Techniques in Geosciences (30 credits)
GL3131 Independent Project (30 credits)

and choose any 4 optional courses equal to the value of 60 credits from the following:
GL3210 Advanced Sedimentology (15 credits)
GL3250 Sedimentary Basin Analysis (15 credits)
GL3200 Marine Geology (15 credits)
GL3300 Aqueous Geology (15 credits)
GL3340 GIS and Remote Sensing (15 credits)
GL3460 Volcanology (15 credits)
GL3510 Planetary Geology and Geophysics (15 credits)

GL3600 Tectonics and Structural Interpretation (15 credits)
GL3800 Advanced Palaeontology (15 credits)
GL3700 Petroleum Geology (15 credits)

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. 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 and this will put restrictions on courses in which failing marks can be condoned (see programme structure above for details).

GL1900 must be passed to progress from stage 1 to stage 2.

GL2520 Computational Earth Sciences and GL2550 Independent Research in Computational Geosciences must be passed to qualify for the award BSc Digital Geosciences.

Failure to meet progression requirements for stages 1 and 2 could result in transfer to the unaccredited BSc Geological Sciences programme.

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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 adviser's role is to advise on academic, pastoral and welfare issues. Students meet with their personal advisers two or three times during the first term in groups of 8-10. Subsequently, responsibility for meetings is placed on the student.
- The Year Tutor is at the centre of the Department's student support systems. Year Tutors, Programme Co-ordinators, course leaders, seminar leaders and departmental administrators provide a back-up system of academic, pastoral and welfare advice.
- All staff available and accessible through dedicated office hours system.
- Representation on the Staff-Student Committee.
- Detailed student handbook and course resources.
- Departmental reading room, with collection of articles and books supporting teaching and learning.
- Extensive supporting materials and learning resources in College libraries and Computer Centre.
- 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 and the Disability and Dyslexia Services for students with disabilities and Specific Learning Difficulties.

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Admissions requirements

Details of the Department's typical offer for each programme of study is available on the Course Finder. However, the Department also has flexibility in its admissions and offer 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 Partnerships 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 and Employability 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 (REF2014) conducted by the Higher Education Funding Council (HEFCE). The scoring system for the REF2014 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. The results for the quality of our research outputs place Royal Holloway 15th in the UK based on an overall Grade Point Average (GPA) score and 20th 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. The BSc Digital Geosciences is not currently subject to accreditation by a professional body. The QAA subject benchmark statement in F640 describes 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).

Single Honours Degree programmes in Digital Geosciences

BSc Digital Geosciences (F640)

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