<table>
<thead>
<tr>
<th>Term dates 2013 - 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Term starts:</strong> Monday 23rd September 2013</td>
</tr>
<tr>
<td>(Teaching starts Monday 30th September 2013)</td>
</tr>
<tr>
<td>(2nd and 3rd year Independent study week 4th – 8th November 2013)</td>
</tr>
<tr>
<td><strong>First Term ends:</strong> Friday 13th December 2013</td>
</tr>
<tr>
<td><strong>Second Term starts:</strong> Monday 13th January 2014</td>
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<tr>
<td>(2nd and 3rd year Independent study week: 17th – 21st February 2014)</td>
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<tr>
<td>Lyell Day 28th February 2014</td>
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<tr>
<td><strong>Second Term ends:</strong> Friday 28th March 2014</td>
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<tr>
<td><strong>Third Term starts:</strong> Monday 28th April 2014</td>
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<tr>
<td><strong>Third Term ends:</strong> Friday 13th June 2014</td>
</tr>
<tr>
<td>(Graduation Ceremonies: 14th – 18th July 2014)</td>
</tr>
</tbody>
</table>

Note that teaching weeks of individual courses may vary; a list of course schedules is posted on the Moodle web site. Note also that some field courses and project deadlines may be scheduled outside these term times.

Disclaimer:
This document was published in September 2013 and was correct at that time. The Department* reserves the right to modify any statement if necessary, make variations to the content or methods of delivery of programmes of study, to discontinue programmes, or merge or combine programmes if such actions are reasonably considered to be necessary by the College. Every effort will be made to keep disruption to a minimum, and to give as much notice as possible.

*Please note, the term ‘Department’ is used to refer to both ‘Departments’ and ‘Schools’.

Students on joint degree programmes will need to use two departmental handbooks.

An electronic copy of this handbook can be found on the departmental website [http://www.rhul.ac.uk/earthsciences/home.aspx](http://www.rhul.ac.uk/earthsciences/home.aspx) where it will be possible to follow the hyperlinks to relevant webpages.

Front cover: An early geochemistry laboratory? Image of a metal assay furnace taken from Agricola’s ‘De Re Metallica’. This book was a very early (1556) but authoritative text outlining the status and practices of mining and smelting (Source: http://www.gutenberg.org).

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Royal Holloway, University of London
Department of Earth Sciences
Undergraduate Handbook 2013/2014

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Welcome (or welcome back!) to the Department of Earth Sciences. Please take time to read through this booklet; it is packed with important and useful information. Do not assume that it does not change from year to year; it does, and each year there are important changes to take note of.

This Undergraduate Handbook, informally referred to as “The Yellow Book”, is produced annually by the Department of Earth Sciences to provide students with essential information about the department, degree programmes and courses. If you have any suggestions about how this booklet may be improved by changing the layout, or adding or removing material, please discuss your ideas with your personal adviser, the academic coordinator or a representative on the student-staff liaison committee.

**Important information - you must read this!**

**Safety**
- The Department is pledged to ensure that everyone working in it does so in a safe environment, whether in an office, in a laboratory, or in the field.
- All students will receive and must read the Earth Sciences Undergraduate Safety Handbook.

**Attendance**
- Attendance at all lectures, practicals, seminars, tutorials and field classes is compulsory.
- Attendance is monitored, and any student with a poor attendance record will be subject to disciplinary procedures that can lead to termination of registration. In addition, please be punctual for any class or appointment.

**Illness**
- Absence due to illness or other extenuating circumstances must be notified in writing to the Departmental Administrator; a medical certificate is required for absences of more than one week.
- You must provide the department with a written record of illness or extenuating circumstances which may affect your performance (especially for examinations and other assessed work), clearly stating the dates (see page 13).

**Fieldwork**
- You must treat the accommodation and other guests with due respect.
- Safety is paramount in the field: you must obey instructions from field trip leaders and any failure to do so may lead to disciplinary action. You must inform the department of any medical condition.

**Plagiarism**
- If work is copied from another student or copied from another source without acknowledgment, this is considered to be plagiarism. This is a serious offence and the matter may warrant disciplinary action (see page 17).

**Submission of work**
- All assessed coursework and reports must be submitted to the departmental office by the specified time. Penalties will be imposed on work submitted late. Extensions can only be approved by the Course Coordinator and then only in exceptional circumstances (see page 14).
- Failure to submit coursework for assessment will result in disciplinary procedures that can lead to termination of registration.

**Information and communication**
- Communication will be through handouts provided in class, notices on the student notice board, notes in the pigeonholes, the Moodle website or via e-mail. It is crucial that you ensure that you have received all information provided by any of these means and that the department has your valid and up to date postal and e-mail addresses.

**Help and advice**
- If you have a problem, you must talk to somebody – your personal adviser, the academic coordinator, head of department, or any member of staff.

**Regulations:**
- It is your responsibility to be familiar with the College Undergraduate Regulations, which can be accessed at http://www.rhul.ac.uk/forstudents/studying/academicregulations/home.aspx.

*More details of all of the above are in this book, so please read on.....*
SECTION A: GENERAL INFORMATION

Introduction

The Department
The Department of Earth Sciences was created at Royal Holloway in 1985 by the merger of former Departments at Bedford, Chelsea and King’s Colleges (all part of London University). The Department is committed to providing an educational environment in which learning and research are inseparable. It aims to foster academic excellence at all levels of study and was awarded the top grade of “Excellent” in a national Teaching Quality Assessment. In the most recent national Research Assessment Exercise, the department achieved the high grade of ‘5’ in recognition of the research of national and international excellence, which is carried out in the department. There are 25 academic staff, 14 research staff, 11 technical and administrative staff, over 200 undergraduates and some 60 postgraduate students (MSc and PhD) in the department.

Location
The Department is located in Queen’s Building, with most teaching staff offices and undergraduate laboratories on level 2 (see map at back of this booklet). Most undergraduate classes are held in the teaching laboratories in rooms 205, 240, 264 and the adjacent science block (the John Bowyer Building, ‘JBB’). The Queens Lecture Theatre (‘QLT’) is on the ground floor of the Queens Building and is accessed from the main foyer. Part of the foyer on level 2 serves as a common room area for staff and students. All students are welcome to use this common room area.

Undergraduate degree programmes
Students are currently admitted to four-year, MSci degree programmes in the Department (Geoscience, Environmental Geoscience, Geoscience with an international year, Environmental Geoscience with an international year), and three-year, single honours, BSc degree programmes (Geology, Petroleum Geology, and Environmental Geology). (In addition, all single honours degrees can be extended by taking a year in industry.) There is also a three-year, joint (approximately 50:50 split between two subjects), degree programme with Geography.

Course Units
Degree programmes at Royal Holloway are composed of a number of course units, normally 12 course units for BSc degrees and 16 course units for MSci degrees. Four course units are normally taken each year comprising of a number of whole or half course units. Courses, either whole or half, may be ‘core’ (i.e. taken by all students on a particular degree programme), ‘compulsory’ (must be taken and passed for progression) or ‘optional’ (i.e. students may choose from a range of options, particularly in the 3rd and 4th years of the degree programme). The course unit structure for each of the degree programmes offered in the Department of Earth Sciences is shown in Section D.

Accredited Degree programmes
The MSci Geoscience, MSci Environmental Geoscience, MSci Petroleum Geology, BSc Geology, BSc Petroleum Geology and BSc Environmental Geology degree programmes have been accredited by the Geological Society as offering a sound training for a professional career and as degree programmes which satisfy the requirements of Fellowship and Chartered Geologist status.

Postgraduate study and research
At postgraduate level, we offer MSc degree courses in Petroleum Geoscience (Basin Evolution or Tectonics) and Environmental Diagnosis and Management, and a MSc by Research, and we sustain a flourishing research school. We are internationally recognised for our strengths in a number of major research areas: Global Environmental Change (modern atmospheres, surface processes, palaeobiology, ancient Earth systems), Geodynamics and Sedimentary Systems (sedimentology, mountain evolution, uplift, and erosion, numerical modelling, lithospheric processes) Physics and Chemistry of Earth Processes (crust-mantle evolution, plumes and ridges, volcanic arcs). We support several research groups focused on regional geology, notably of Southeast Asia. Our research activities influence our teaching: a team spirit in research is reflected in our teaching and in student learning.

Staff list
Title, name, room number and telephone (01784-44-)

| Head of Department:   | Prof Jason Morgan                  | 216 3606 |
| Professor of Petroleum Geology: | Prof. Peter Burgess                | 222c (41)4083 |
| Professor of Plant Palaeobiology: | Prof. Margaret Collinson           | 254 3607 |
| Professor of Structural Geology: | Prof. Agust Gudmundsson            | 282 (27)6345 |
| Professor of Geology: | Prof. Robert Hall                  | 268b 3592 |

You will need to be able to contact members of the department, for example if you are unable to attend a class, or wish to arrange a meeting with a tutor or your Personal Adviser.

E-mail

The College provides an email address for all students free of charge and stores the address in a College email directory (the Global Address List). Your account is easily accessed, both on and off campus, via the student portal at this web address: https://campus-connect.rhul.ac.uk/cp/home/displaylogin (Campus Connect) or direct via Outlook.com http://outlook.com/

Email to this address will be used routinely for all communication with students. Email may be used for urgent communication and by course tutors to give or confirm instructions or information related to teaching so it is important that you build into your routine that you check your emails once a day. Email communications from staff and all the Faculty Administrators should be treated as important and read carefully.

It is also important that you regularly clear your college account of unwanted messages or your account will be clogged and unable to accept messages. Just deleting messages is not sufficient; you must clear the sent and delete folders regularly. It is your responsibility to make sure your College e-mail account is kept in working order. If you have any problems contact the IT help desk.

The Department of Earth Sciences will only use the address in the College Directory and does not use private or commercial e-mail addresses, such as hotmail or Gmail. Students who prefer to use commercial e-mail services are responsible for making sure that their College e-mail is diverted to the appropriate commercial address. Detailed instructions on how to forward mail can be accessed by visiting http://help.outlook.com and searching for forwarding. This process is very easy, but you do have to maintain your College account. When you delete a forwarded message from, say, hotmail, it will not be deleted from the RHUL account. It is your responsibility to log on to your College account occasionally and conduct some account maintenance or your account may become full and therefore will not forward messages.

If you send an e-mail to a member of staff in the department during term time you should normally receive a reply within 3-4 working days of its receipt. Please remember that there are times when members of staff are away from College at conferences or undertaking research.

Post
All post addressed to students in Earth Sciences is delivered to the student pigeonholes (alphabetical by surname) located outside room 205. At the end of each term student pigeonholes are cleared of accumulated mail, which is then destroyed. Important information from Registry is often sent by internal post and tutors sometimes return work to you via the pigeonholes, so you are advised to check them regularly.

Telephone and postal address
It is your responsibility to ensure that your telephone number (mobile and landline) and postal address (term time and forwarding) are kept up to date on the student portal (Campus Connect). There are occasions when the department needs to contact you urgently by telephone or send you a letter by post.

It is your responsibility to ensure that your telephone number (mobile and landline) and postal address (term-time and forwarding) are kept up to date on the student portal (Campus Connect) https://campus-connect.rhul.ac.uk/cp/home/displaylogin. There are occasions when the Department needs to contact you urgently by telephone or send you a letter by post.

The Department does not disclose students’ addresses and telephone numbers to anybody else (including relatives and fellow students) without the student’s specific permission to do so.

Notice Boards
The official student notice boards are on the walls outside room 201. Every effort is made to post notices relating to class times, etc., well in advance, but occasionally changes have to be made at short notice and in that case e-mail will be used.

It is your responsibility to make sure you are informed of the times and places of all class meetings and of any requirements (e.g. report deadlines) relating to your courses; so, if in doubt, please ask!

If you need to leave a document for a member of staff, the pigeonholes for all staff are located in the departmental post/photocopy room (Room 257). Photographs of all staff in the Department are displayed in the Department foyer.

Whom to contact
If you have any questions or doubts about any aspects of your courses, or any other queries about the department or college, please seek advice from your personal adviser, the Academic Coordinator (Dr David Alderton), the Head of Department (Prof Jason Morgan) or any other member of the academic staff.

The Academic Coordinator supervises student registration, ensures proper liaison between the College and students in the Department, co-operates with coordinators in other departments in making inter-departmental arrangements for courses, and has overall responsibility for degree course structure and content. Within the Department, any changes to Degree Programme, course unit registration or exam entry, must be authorized by his signature.

• If you have any questions relating to lectures, practicals or the assessment of a particular course, see the course coordinator (see list of courses in Section E)
• Questions about degree programmes, options and transfer should be addressed to the degree programme coordinator.
• All field courses are associated with a course number (see fieldwork schedule on page 10) and questions should be addressed to the coordinator for the relevant course.
• Your Personal Adviser will be able to help you with general guidance about academic issues.
• You may wish to talk to your personal adviser about non-academic issues, or alternatively you may take problems to a member of the College staff (see below).
• If you wish to discuss something with a senior member of the academic staff, the Academic Coordinator (Dr David Alderton) will normally be the most appropriate person to talk to. Appointments may be made to see the Head of Department (Prof Jason Morgan) through the Departmental Administrator (Julie Brown).

Course Coordinators
Each course unit presented by the Department is managed by a Course Coordinator, as indicated in the synopses of courses listed in this handbook in Section E. Any queries about delivery and assessment of a particular course should be directed to the course coordinator.

Earth Sciences Staff Administrative Responsibilities

<table>
<thead>
<tr>
<th>Head of Department</th>
<th>Prof Jason Morgan</th>
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<tbody>
<tr>
<td>Undergraduate Admissions</td>
<td>Prof Dave Mattey</td>
</tr>
<tr>
<td>Academic Coordinator</td>
<td>Dr David Alderton</td>
</tr>
<tr>
<td>Timetables</td>
<td>Prof Collinson/Julie Brown</td>
</tr>
<tr>
<td>Student/Staff Liaison</td>
<td>Prof Agust Gudmundsson</td>
</tr>
<tr>
<td>Field Courses</td>
<td>Dr Dan Le Heron</td>
</tr>
<tr>
<td>Personal Adviser Coordinator</td>
<td>Prof Matthew Thirlwall</td>
</tr>
<tr>
<td>Health &amp; Safety Coordinator</td>
<td>Mr Dan Parsonage</td>
</tr>
<tr>
<td>Examinations</td>
<td>Ms Julie Brown</td>
</tr>
<tr>
<td>Library</td>
<td>Prof Robert Hall</td>
</tr>
<tr>
<td>Disabilities Adviser</td>
<td>Dr Dan Le Heron</td>
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</table>
College Administration contacts

The main source for information and advice is the College Support and Advisory Services. This service covers the following areas:

- Careers Service
- Chaplaincy
- Community Liaison & Student Discipline
- Educational Support Office
- Health Centre
- International Student support
- Financial & Funding advice
- Equal Opportunities
- Student Counselling Service

Full details are provided in the Support for students section of the College website (http://www.rhul.ac.uk/forstudents/home.aspx).

Security:
General Office (non-urgent enquiries) (01784-44) 3063
Emergency (internal phones) 444

Careers Information and advice

The College has a careers advisory service, housed in the Horton Building, which is open to any student during normal College hours.

http://www.rhul.ac.uk/careers/home.aspx

Careers information, including job vacancies, is posted on the notice board in the corridor outside Room 228. Within the Department, careers advice is given by personal advisers and the College Careers Service is also available to give general information and advice.

A number of second and third year students are able to benefit from the close ties that the Department has with industry to obtain employment during the summer vacation. This provides work experience of value for future careers and sometimes also affords opportunities for final year project studies.

Personal Advisers and Tutorials

Personal Advisers

Personal Advisers are responsible for giving students guidance in their studies and for offering advice, should any academic or personal problems arise. Your Personal Adviser in your final year will normally be prepared to provide you with references for jobs or further study. Each single or joint honours student is assigned a member of the teaching or research staff as a Personal Adviser, and the Personal Adviser will change each year.

Tutorials

Personal Advisers will organise tutorials which will be attended by all students in the tutorial group. These will be held regularly and should take place about once a fortnight (five or six times a term) in the first two terms of the first year, but usually decreasing in frequency in later years. In exam terms Personal Advisers will be available (by arrangement) for consultation and to assist with revision. For some tutorials, students may be expected to complete some work. Other tutorials will provide the opportunity to discuss project work, problems with the course and study techniques.

If you fail to attend a tutorial, you must see your Personal Adviser (preferably in advance) to explain the reason and to find out what was covered. Attendance at tutorials is compulsory and is carefully monitored by the Department.

Confidentiality

It is very important that you notify your Personal Adviser about any personal or family problems you may be facing, or if you are unhappy with the course or the College. A student may ask to discuss any matter in confidence with their personal adviser, the Academic Coordinator or the Head of Department. If confidentiality has been requested, the issues will not be discussed with any other person without the permission of the student (but subject to College regulations). In some circumstances the student will be advised to approach another member of departmental or college staff that may be more qualified to provide help or advice.

Using your Personal Adviser as a referee

Your Personal Adviser is the first person to ask if you need a reference for summer vacation employment or for post-graduate training or work. Always ask, however, before using names on an application or curriculum vitae: the person concerned may be planning to be away on leave or fieldwork that would make him/her unavailable at the critical time, or there may be other reasons why he/she cannot act on your behalf on every occasion. You may find it helpful to let your personal adviser comment on your c.v. before sending it to prospective employers. It is in your own interest to remain in regular contact with your Personal Adviser throughout your period of study and after you have graduated, keeping them acquainted with your career plans and progress.

Student-Staff Liaison Committee

Students are encouraged to discuss any matter of concern with their Personal Adviser or any other member of the academic staff. In many cases an informal discussion will
provide a satisfactory resolution to a problem. There are, however, issues which are appropriate to raise through the more formal forum of the Student-Staff Liaison Committee. This committee meets once a term and plays an important role in the Department as a forum for airing student views. Notices will appear on the notice board outside room 201, giving the names of current representatives. student views. For its constitution see http://www.rhul.ac.uk/quad/collegepolicies/documents/pdf/compliance/committeesandhandbookmarch2013.pdf

These student representatives appointed by each year group act as spokespersons for the student body on any academic matters and other issues, such as departmental facilities.

The recommendations of the Student-Staff Liaison Committee are discussed as a standing agenda item at every ordinary meeting of the Departmental Board in Earth Sciences, when appropriate action is decided. Details of the Liaison Committee’s meetings are posted on a notice board outside Room 201. The active involvement of undergraduate students in the Student-Staff Liaison Committee is strongly encouraged by the department: the students involved in this discussion forum provide valuable input into the course structures, learning facilities and teaching arrangements on behalf of their peers.

**Student Feedback**

At least once each year, students are asked to complete a detailed questionnaire on each of the courses they have taken. Completed questionnaires are returned anonymously, but give students the opportunity to comment on each course unit overall, the practicals, any coursework tasks, and individual lecturers. The views expressed in these questionnaires are used by the Department to review and, if necessary, improve teaching quality. A similar procedure is used to obtain student views on field courses.

The Department, the Faculty and the College all continually review degree programmes and individual course units. These questionnaires form an important part of the quality assurance process in the department by providing a mechanism for students to take part in the review of courses.

**Complaints procedures**

If you have a complaint relating to any aspect of the Department or its staff or to any academic or College matter, you should first discuss it informally with your Personal Advisor or with another member of staff in the Department. We would hope that the majority of issues of this kind can be resolved by informal discussion.

There are, however, procedures that can be invoked in serious cases. These are set out in the College Complaints Procedures for students http://www.rhul.ac.uk/ecampus/academicsupport/complaintsprocedure.aspx. You should raise your complaint as soon as possible.

If the complaint concerns an academic decision, there is an academic appeals process. Please note that an academic appeal can only be submitted once you have received your results via the College portal. Details of the appeals procedures and permitted grounds for appeal can be found on the following webpage http://www.rhul.ac.uk/ecampus/academicsupport/academicappealsandcollegecomplaints.aspx

**Departmental Facilities**

**Teaching Laboratories**

Students are allowed in teaching laboratories (rooms 205, 240, 264, and the new block) for private study at any time during the working day when the room is not being used for a timetabled class. The times of classes are displayed on the door of each of these laboratories. Students can use their college card to gain access to the class rooms in Queen’s Building for working out of normal working hours. Undergraduate students are not allowed to work in research laboratories at any time unless supervised by a member of staff.

**Microscopes**

Every student who requires one is issued with a microscope in a locker. There is a £5 deposit for the key. Students must return the locker key at the end of the year; no attempt the deposit is forfeited. Any faults should be reported to Dan Parsonage (Room 265 in the Foyer) immediately; no attempt should be made to repair the equipment. The microscopes are shared between students of different year groups and can be used at any time when there is no scheduled class. They must not be removed from the Department under any circumstances.

**Libraries, Computing, Printing and Photo-copying**

There are 2 libraries on campus:

- **Founder’s Library**, located on the South Side of Founder’s Building, houses most language, literature, film, music and theatre material;
- **Bedford Library**, located up the hill from the Students’ Union next to the History Department, houses science, social science and history material;

Details, including further resources available, opening times and regulations, can be found online:

If you cannot find the specific items that you require in the libraries, it is possible to order items from other libraries by inter-library loan or to gain access to the Senate House Library or other university libraries. You can obtain further information on this by asking at the library helpdesks. The Information Consultant for Earth Sciences is Adrian Machiraju, who can be contacted at A.Machiraju@rhul.ac.uk

The Library provides a range of training sessions designed to enhance your existing library and research skills. These are available in both class-based and self-study formats. For information on available sessions and to book a place, go to: http://www.rhul.ac.uk/library/helpandsupport/findinginformation.aspx

Most texts and journals relevant to Earth Sciences are housed in the Bedford Library. This library also contains numerous computers for students use and has photocopying facilities.

The departmental photocopier is in constant use by office staff and lecturers. For this reason, we are unable to allow undergraduate students to use it. Instead you can use copier-printers (MFDs) located in the libraries, the Computer Centre and many PC labs, which will allow you to make copies in either black and white or colour. Further information is available online: http://www.rhul.ac.uk/library/usingourlibraries/photocopyingandprinting.aspx

There are also several computer rooms throughout the campus, set up by the Computer Centre and for the use of all undergraduates. Any problems with these facilities should be reported to the Computer Centre.

Many of the PC labs are open 24 hours a day, 7 days a week. Alternatively, there are computers available for your use in the libraries and Computer Centre.

The Computer Centre provides a range of IT training sessions designed to enhance your current IT skills. These are available in both class-based and self-study formats, and successful completion of the course is rewarded by a College IT Skills certificate. To participate in these sessions, go to: http://www.rhul.ac.uk/it/training/home.aspx

http://www.rhul.ac.uk/earthsciences/lyellsoc/home.aspx

Lyell Society Committee organises a programme of lectures by distinguished speakers, a social programme and occasional field excursions. The Society also arranges an annual symposium and dinner in mid/late February. The New Lyell Society is recognised by the Students’ Union and, as such, is an official part of the activities of the College. The Society has a notice board in the foyer of the Department on which details of committee membership, future meetings and social events are displayed, and a website: http://www.rhul.ac.uk/earthsciences/lyellsoc/home.aspx

Research Seminars
There is a programme of research seminars presented by staff, postgraduate students and academic visitors to the department. These may be on a wide variety of topics, and all students are welcome to attend. Details of forthcoming seminars are posted on the ‘Geology Today’ notice board at the top of the stairs.

The Department produces a newsletter at regular intervals. Contributions of interest to the department (events, sporting achievements, fieldwork, etc.) should be forwarded to Derek Blundell (d.blundell@rhul.ac.uk).

Safety
The Department has a strong commitment to safety in all its activities. Its safety policy and codes of practice for laboratory work in the Department and for field work are set out in the Earth Sciences Student Safety Handbook which is given to every student on enrolment. This must be read carefully and its procedures strictly adhered to on all occasions. The handbook should be retained carefully for reference but further copies are available from the Departmental Office.

Earth Sciences students, for whom fieldwork is compulsory, must purchase first aid kits, emergency blankets, safety helmets and glasses (e.g. from the on-line store). Safety helmets must be worn at all times in working quarries, in any other places where there are similar hazards, and whenever instructed by a member of staff. Safety glasses must be worn when hammering rocks. Suitable footwear for rough ground and adequate clothing for protection against the weather conditions must be worn for fieldwork.

The member of staff leading it will carry out a Hazard Assessment for every field class. You will be required to complete a hazard assessment form of your own for every piece of independent field or laboratory work that you undertake.

Department Activities

New Lyell Geological Society
This important feature of departmental activity is organised by undergraduate students with the assistance of postgraduate students and academic staff. The New Lyell Society Committee organises a programme of lectures by distinguished speakers, a social programme and occasional field excursions. The Society also arranges an annual symposium and dinner in mid/late February. The New Lyell Society is recognised by the Students’ Union and, as such, is an official part of the activities of the College. The Society has a notice board in the foyer of the Department on which details of committee membership, future meetings and social events are displayed, and a website: http://www.rhul.ac.uk/earthsciences/lyellsoc/home.aspx

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The Department produces a newsletter at regular intervals. Contributions of interest to the department (events, sporting achievements, fieldwork, etc.) should be forwarded to Derek Blundell (d.blundell@rhul.ac.uk).

Safety
The Department has a strong commitment to safety in all its activities. Its safety policy and codes of practice for laboratory work in the Department and for field work are set out in the Earth Sciences Student Safety Handbook which is given to every student on enrolment. This must be read carefully and its procedures strictly adhered to on all occasions. The handbook should be retained carefully for reference but further copies are available from the Departmental Office.

Earth Sciences students, for whom fieldwork is compulsory, must purchase first aid kits, emergency blankets, safety helmets and glasses (e.g. from the on-line store). Safety helmets must be worn at all times in working quarries, in any other places where there are similar hazards, and whenever instructed by a member of staff. Safety glasses must be worn when hammering rocks. Suitable footwear for rough ground and adequate clothing for protection against the weather conditions must be worn for fieldwork.

The member of staff leading it will carry out a Hazard Assessment for every field class. You will be required to complete a hazard assessment form of your own for every piece of independent field or laboratory work that you undertake.
Students who are not properly equipped or who fail to heed safety advice in the field or laboratory will be excluded from the relevant field and practical classes. It is essential that field trip leaders are aware of any specific medical conditions you suffer from that may affect your health or safety in the field (e.g. diabetes, asthma). We ask you to complete a confidential form when you first arrive in the Department detailing any such conditions; this will be kept on file, and field trip leaders will be advised as and when they need to know.

Please note that the Health Centre will not pass on such information from your medical record, so we rely on you to bring such matters to our attention. Please contact our Disability Coordinator, Dr Dan Le Heron, if you have a disability which may affect your field or laboratory work.

Please contact the Departmental Health & Safety Coordinator, Dan Parsonage (Room 265, tel: 3595) or the College Health and Safety Office if you have any query about health and safety. Copies of all departmental safety policies are kept in room 265.

There is a Code of practice on harassment for students which can be found on the student home pages under codes and regulations http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx

Lone working policy and procedure
The College has a 'Lone Working Policy and Procedure' that can be found at http://www.rhul.ac.uk/iquad/documents/pdf/healthandsafety/loneworkingpolicy2010.pdf

Lone working is defined as working during either normal working hours at an isolated location within the normal workplace or when working outside of normal hours. The type of work normally conducted by Earth Science undergraduate students is classified as a low risk activity and as such the following advice is relevant:

- Lone working is permitted, but it is good practice to ensure that a second person is aware of the first person’s location and that they have access to means of communication.
- It is recommended that the second person could be a relative/friend who knows where the first person is located and approximate time of return. Relevant details should be exchanged (e.g. campus number and security telephone number).
- Inspections/risk assessments of the work area are by the Departmental Health and Safety Coordinator to ensure that hazards have been identified, risks controlled and provisions for

emergencies are in place (e.g. escape routes open, fire fighting equipment, first aid etc.).

Note that the principles contained in the above section will apply to students undertaking any duties outside of campus, including fieldwork.

Fieldwork

Fieldwork is regarded as an important part of the curriculum throughout the undergraduate degree course. Some of the Earth Sciences course units have specific requirements for field study, and each of the degree programmes has an integral fieldwork component. For instance, field mapping (GL3901) is an integral (i.e. compulsory) part of the Geology and Geoscience degrees, and GL3940 (Methods of environmental investigation) for the Environmental geology/geoscience degrees. Failure to complete fieldwork to a satisfactory standard is likely to have significant repercussions on progression and the final degree awarded.

In our undergraduate field-training programme we seek:
- to excite interest in Earth Sciences and enhance individual motivation;
- to reinforce and build on knowledge and understanding gained in lectures and practicals;
- to help students to gain confidence and become skilled in analysing three-dimensional relationships;
- to train all students in the essential practical skills of field geology, geophysics and geochemistry, and to enable each to gain in confidence, competence and self-reliance through practical experience;
- to train all students in safe field practice and establish a culture of individual responsibility for the well being of self and others;
- to provide an alternative channel for informal but formative contact between staff and students.

Notice of all the fieldtrips that you will be expected to attend in a given year of study can be found in this handbook. A notice will be posted on the Year Notice board giving details of forthcoming field trips. The notice will also announce a briefing meeting to explain the objectives of the trip, to discuss safety requirements, and to answer questions. Every student going on the trip is formally required to attend the briefing unless specifically excused by the fieldtrip leader. If you miss a
briefing, you must see the leader immediately.

**Codes of practice**
Field classes and independent field work are undertaken following the code of practice set out by the Geologists’ Association and a safety code for field work prepared by the Committee of Heads of University Geoscience Departments, as summarised in the *Earth Sciences Student Safety Handbook* issued to all students on enrolment. Safety briefings are arranged by the Department before all field trips. These are compulsory and students not attending these will not be able to take part in the relevant trip/course.

**Field equipment**
The Department requires each student to possess his/her own approved Fieldwork Pack, which contains safety helmet, first aid kit, whistle, safety blanket, eye protection (when using hammer), field notebook, hand lens, compass clinometer, grain size comparator card, and geological time scale card. This is available for £130 from the Online Store (see [www.rhul.ac.uk/earthsciences/informationforcurrentstudents/home.aspx](http://www.rhul.ac.uk/earthsciences/informationforcurrentstudents/home.aspx)). The pack must be taken on all field excursions and used when instructed. Excursion leaders have the authority to exclude from a trip any student who is inadequately clothed or equipped. Notebooks may also be purchased separately from the Online Store; all other equipment may be purchased from Geo Supplies ([www.geosupplies.co.uk](http://www.geosupplies.co.uk)) or UKGE Ltd ([www.ukge.com](http://www.ukge.com)).

**Overseas field trips**
All students will need a passport for overseas field courses. Please advise the Department Office if your name on the College records differs from that on your passport, or if you have a non-EU (and non-UK) passport. You should also check to see if there are specific visa requirements. Although you will be covered by College insurance, the possession of the European Health Insurance Card (EHIC) may facilitate health care provision in European Economic Area countries. You can obtain this card by applying on-line or using a form obtainable from a Post Office.

**Degree Programmes**
Royal Holloway has a University of London modular system for organising degree programmes by building them from various combinations of course units. The particular combination of course units taken defines the Degree Programme. The core and optional course units for each degree programme are shown in the tables in Section D.

<table>
<thead>
<tr>
<th>Field Programme for 2013/2014</th>
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<tbody>
<tr>
<td><strong>First year</strong></td>
</tr>
<tr>
<td>Oct 4 – 6 GL1100</td>
</tr>
<tr>
<td>Nov 16 GL1800</td>
</tr>
<tr>
<td>Feb tbc GL1600</td>
</tr>
<tr>
<td>March 29-April 2 GL1300/1750</td>
</tr>
<tr>
<td><strong>Second year</strong></td>
</tr>
<tr>
<td>Sept 20 - 28 GL2901/2930</td>
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<tr>
<td>Feb 10 - 24 GL2901/GL2930</td>
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<tr>
<td>May – June GL3901/3920/3951</td>
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<tr>
<td>May – June GL3940</td>
</tr>
<tr>
<td><strong>Third year</strong></td>
</tr>
<tr>
<td>Dec tbc GL3001</td>
</tr>
<tr>
<td>Dec 13 - 20 GL3001</td>
</tr>
<tr>
<td><strong>Fourth Year</strong></td>
</tr>
<tr>
<td>Early – mid July GL4400/GL4411</td>
</tr>
</tbody>
</table>

**Study in another country**
The Department and the College offer students the opportunity to study abroad for a year through the International Exchange programme and the Erasmus programme. Students are able to apply to study abroad in...
Europe or at one of 24 International institutions in the USA, Canada, Australia, New Zealand, Hong Kong, South Korea, Japan and Singapore, either as an integral part of their MSci degree programme or as an additional year of study. Further details on participating in such programmes and restrictions placed on students in different departments are available at http://www.rhul.ac.uk/international/studyabroadandexchanges/home.aspx or from the Visiting Student Team in Royal Holloway International. Note that a proportion of the tuition fees must still be paid to the College during the year abroad.

Regulations

Attendance

The Department monitors your attendance, academic engagement and progress in order to offer you appropriate academic and pastoral support and to identify where support from outside the Department may be necessary. Inadequate engagement on a course may lead to disciplinary action which can result in the termination of your registration (see section on Disciplinary action) or, on courses where the attendance requirements are stated in the course specification, the outcome of Attendance Fail (AF) (see the section on Outcomes of course assessment for further explanation of the AF outcome).

Students must

- attend all classes necessary for the pursuit of their studies,
- undertake all assessments and
- attend meetings and other activities as required by the Department.

A class is any learning and teaching activity and the term is used to encompass such things as lectures, seminars, tutorials, workshop, field work, laboratories, advisor meetings etc. This means not simply turning up – but arriving having undertaken whatever reading, thinking, or research was identified as necessary preparation. You are also expected to arrive punctually - teaching activities are timetabled to start at 5 minutes past the hour and finish 5 minutes before the hour. You may be marked absent if you turn up late without good reason.

The department will monitor your attendance at all learning activities. It is your responsibility to complete any attendance register that is circulated and to make sure that your attendance has been noted. The activities at which your attendance is monitored may vary depending upon the discipline in which you are studying.

It is important that you attend all the learning activities related to your programme of study. Whilst attendance is compulsory at all learning activities it is recognised that emergencies may occur at any time throughout the year. You should also be aware that there may be some courses which you study which have a specific course attendance requirement. If you face difficulty in attending any classes or undertaking an assessment it is your responsibility to inform the department(s) in which you are studying and provide a satisfactory explanation. As long as you are meticulous in your honesty in reporting and explaining these exceptions, we aim to be understanding in our response.

You must manage your time so that any paid employment, voluntary or other activities fit into the times when you are not required to be in a class. You are reminded that Undergraduate Regulations stipulate that the amount of paid work undertaken by a student enrolled with the College on a full-time basis shall not exceed 20 hours per week during term time. No student may undertake paid work which may conflict with his/her responsibilities as a student of the College.

If you are having other problems that are causing you to miss classes, you should talk to your Personal Adviser, year tutor or another member of staff, or visit the Student Advisory Service or Students’ Union before your problems get out of control. There are many people who can provide support but remember - they cannot help if you do not ask.

In recognition of its legal responsibilities under the Equality Act 2010, the College may adjust the attendance requirement. It will only do this when such adjustment does not compromise competence standards or the ability of the student to reach the learning outcomes of the course. Any need to adjust attendance requirements will be treated case by case and discussed by the department with the Educational Support Office and Academic Development.

Notification of absence

This guidance applies if you are absent from classes for...
any reason.
You must
a. advise your department by emailing the lecturer concerned.
   b. complete the Notification of Absence Form available from eCampus found at this address: http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx. Copies of the Notification of Absence Form – Self certification are also available from the Health Centre.
   c. submit the paperwork to your department(s) either before your absence or within FIVE working days of the end of the period of absence. Failure to do so may result in the absence being counted as unacceptable and counting against the minimum attendance level.
   d. ensure that you meet any departmental requirements concerning notification of absence or request for leave of absence as you may be required to meet formally with an academic tutor.

This is the documentation that is required should you be absent for any reason:
For Illness up to and including 5 consecutive term-time days (excluding Saturdays and Sundays) you will need a ‘Completed Notification of Absence Form – Self Certification’;
For Illness for more than 5 consecutive term-time days (excluding Saturdays and Sundays) you will need a ‘Completed Notification of Absence Form – Self Certification’ plus formal Medical Certification signed by the Health Centre, your GP or hospital consultant;
For an absence unrelated to sickness you will need a Notification of Absence Form plus supporting evidence (see the following address: http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx for details of documentation required).

Note:
• If you should be absent for a prolonged period it is important that you keep in touch with your department.
• Departments will monitor the frequency of self-certified absences and a Head of Department may request that you provide a doctor’s medical certificate in multiple and sustained instances of self-certified illness.

It is at the discretion of the Department as to whether any absence is deemed acceptable or unacceptable (see http://www.rhul.ac.uk/ecampus/academicsupport/attendance/notificationofabsence.aspx for details of what constitutes ‘acceptable’ and ‘unacceptable’ circumstances relating to absence). If deemed unacceptable the absence will be recorded as such and will count against the minimum attendance level. For further details on the type of supporting evidence that you may be required to provide as justification of absence, please click on ‘Studying’ tab on the Student Home page. http://www.rhul.ac.uk/ecampus/academicsupport/attendance/home.aspx

If you are absent from an examination or assessment then you must follow the guidance in the Essential Examinations Information http://www.rhul.ac.uk/ecampus/academicsupport/examinations/examinations/home.aspx (see also the section on Assessment information).

Meetings
You are likely to be ‘invited’ to meet with a member of academic staff in your department:
• If you fail to attend all learning activities in two consecutive weeks without providing an explanation
• where your pattern of absence is:
  • considered to be having an effect on your work or causing concern for your well being
  • pointing to a possible disability that you may not have disclosed.
  • where your attendance is approaching the minimum attendance level.

You should take any meeting ‘invitation’ seriously. If you should have problems, then you are being offered an opportunity to seek advice and assistance. At the meeting the Department’s expectation of you will be made clear and the formal disciplinary process will be outlined to you.

Disciplinary action
Should you choose not to pay attention to your studies then formal disciplinary action may be implemented. You could be issued with a formal warning which can escalate to the termination of your registration at the College. You are strongly advised to read the guidance on the formal warning process and the consequences of receiving such a warning on http://www.rhul.ac.uk/ecampus/academicsupport/formalwarnings/formalwarnings.aspx and in the relevant regulations: http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx
On courses where there is a specified attendance level requirement the Departmental Sub-Board of Examiners may judge that you have not fulfilled the learning outcomes of a course and award the outcome of Attendance Fail (AF) for the course. Students who receive the outcome of AF for a course have not passed the course; they are not permitted to re-sit the assessment for the course and must repeat the course in attendance in order to complete it. Thus the outcome of AF can prevent your progress to the next year of your degree programme, or even from graduating.

In situations where documented severe difficulties are experienced by a student the College will make every effort to support the student and counsel them as to the best course of action. However, there may be cases where, although non-attendance is explained by an acceptable reason the student’s level of attendance falls to a level which compromises educational standards or the ability of the student to reach the learning outcomes of the course. In such cases it will be necessary to implement disciplinary procedures as detailed above.

Withdrawal of visa
If you are in receipt of a Tier 4 Student Visa sponsored by Royal Holloway, it is a requirement of your Visa that you attend classes and complete assessments. This is also a requirement of the College's academic regulations. The College has a legal responsibility to report any student admitted to the College on a student visa who does not appear to be in attendance to the UK Border Agency (UKBA). Therefore if you fail to meet UKBA visa requirements and/or fail to respond to informal and formal warnings from the College in this regard you could have your sponsorship withdrawn, your Visa cancelled and your registration with the College terminated. The termination of registration due to a breach in Visa requirements is conducted independently of the College's formal warning process and the decision is not open to appeal.

Illness and other extenuating circumstances
If you are taken ill or there are other extenuating circumstances that you believe have adversely affected your performance in relation to any aspect of your course/programme (for example, your attendance, submission of work, or examination performance) at any point during the academic year, you must inform your department(s) in writing, and provide the appropriate evidence. Please read the “Instructions to Candidates” issued by the Examinations Office. http://www.rhul.ac.uk/ecampus/academicsupport/examinations/examinations/home.aspx for full details on how and when to inform your department about such circumstances as well as the deadline for submission of such information.

Absence from an examination / failure to submit coursework
Please see the section on Progression and Award Requirements on page 16 for further details of the impact on course outcomes of failure to attend an examination or to submit required coursework.

If you miss an examination or fail to submit a piece of assessed coursework through illness, or other acceptable cause for which adequate documentation is provided in accordance with the section Illness or other extenuating circumstances in the Instructions to Candidates the Sub-board of Examiners may take this into account when considering your results.

We do realise that emergencies may occur at anytime throughout the year and therefore allow for unavoidable absences. If you are taken ill or there are other extenuating circumstances that you believe have adversely affected your performance at any point during the academic year, you must inform the department in writing, and provide the appropriate evidence. Additionally, if you feel you need to make a further statement on how you consider your circumstances have had an impact on your work, you should submit this to the Departmental Administrator (Julie Brown). The Sub-board of Examiners will review all evidence of extenuating circumstances submitted during the year; however, it is at the Sub-board’s discretion whether to take any circumstances into account. There is no guarantee that any allowance will be made. The main points to note are:

(a) It is your responsibility to notify the department in writing of any extenuating circumstances. Do not assume that if you have discussed your circumstances with the College Health Centre or Counselling Service, or informally with a member of staff in the department, that the information will be passed on to the Sub-board of Examiners on your behalf. Members of staff are not permitted to divulge personal information about students in this way; you must inform the department in writing if you wish your circumstances to be considered.

(b) It is your responsibility to submit the supporting evidence of your circumstances (see below). For medical or psychological circumstances, this will need to be a note from a suitably qualified medical practitioner.
All evidence must include the following information:

whether to take any circumstances into account that it is at the academic judgment of the examiners achieved and therefore about the standard of work which a student may have examiners to make accurate and consistent assumptions. Furthermore, please note the statement that it is at the academic judgment of the examiners whether to take any circumstances into account.

(c) You must submit your written statement and supporting evidence, where appropriate, before the specified deadline (but should also check with your department regarding specific assessment/exam related submissions).

(d) It is recommended that you submit your request and evidence as soon as possible, even if you are unsure whether your circumstances have affected your performance, or you feel that your circumstances are very private or confidential (see below). Do not wait until you receive your marks. Requests for special consideration will not be considered retrospectively and the private or confidential nature of circumstances will not later be accepted as grounds for appeal.

You should submit your statement and relevant supporting evidence to the Senior Faculty Administrator in all departments in which you have taken courses, in a sealed envelope marked ‘Confidential’ and addressed to the Chair of the Sub-board of Examiners. The request must state clearly how you consider your circumstances have affected your academic performance whether this relates to absence from classes, non-submission of work, and/or the impact on your ability to study and on the quality of your work. If you have circumstances with long-term implications and have submitted a request together with supporting evidence for these to be taken into account in a particular year of study, this information will be carried forward to the following year by the Sub-board. You should therefore only submit a further statement with updated information should there be a change to your circumstances of which the Sub-board needs to be aware.

Please note that it is not possible for Sub-boards of examiners to make accurate and consistent assumptions about the standard of work which a student may have achieved and therefore examiners will not raise individual marks on the grounds of extenuating circumstances. Furthermore, please note the statement that all evidence must include the following information:

- (a) your name;
- (b) the name, position and official stamp of the person providing the evidence;
- (c) the date on which the document is produced;
- (d) a description of the nature and severity of the circumstances [NB Please note that if you have a condition which is under investigation, it is not necessary to have this diagnosed before submitting details. The supporting evidence should stipulate the effect of the condition on your work and performance and the relevant information must be submitted before the deadline];
- (e) an exact indication of the period during which you were affected by the circumstances;
- (f) an assessment of the effect, if any, which the condition may have had on your work and performance.

Your statement and relevant supporting evidence will be considered by only a small panel of examiners, including the Chair of the Sub-board of Examiners, the Head of Department and at least one of the Visiting Examiners, in a closed meeting to protect your privacy.

Coursework deadlines

Deadlines for assessed projects and reports will be given at the time the work is set. All courses in all years have elements of coursework which form part of the assessment of the course. You will receive notification of the submission dates for all other assessed coursework (NB. never on a Friday for ‘hard’ copies). Unless otherwise stated the work should be handed in to the Departmental Office (Room 215) by 14.00 on the day of the deadline. Any changes to these dates and deadlines for submission of work will be posted on the departmental notice boards and/or students will be informed by e-mail.

In most cases, your coursework should be submitted anonymously (i.e. using candidate number rather than name).

Feedback and return of assessed coursework

The following College policy applies to the return of written coursework:

Assessed work (other than formal examinations) should be returned within 4 weeks of the submission deadline, except in cases where it is not appropriate to do so for academic reasons (e.g. 3rd or 4th year which may have to be retained by the department for inspection by the Visiting Examiners in May/June). The deadline for the return of marked work should be made clear to students...
when they receive their assignments. In the event that the intended deadline cannot be met, the revised deadline must be communicated to students as soon as possible.

If you feel that there are several deadlines which ‘clash’ at one time, you are advised to see the relevant lecturer and ask for some flexibility.

Feedback will be provided for all assessed coursework in a variety of forms, including (a) written comment on individual pieces of work, (b) general comments provided verbally or as a summary sheet to the whole class (c) written or verbal comments provided through the students’ personal adviser. You are urged to seek feedback, but note that any marks given to you will be provisional.

Whilst we strive to provide feedback within a reasonable time, students are always welcome to seek feedback and comments during practical classes.

**Penalties for late submission and over-length work**

The following College policy applies to all students on taught programmes of study.

All coursework should be submitted by the specified deadline. Please ensure that you are aware of the deadlines set by the department. Work that is submitted after the deadline will be penalised as follows:

- For work submitted up to 24 hours late, the mark will be reduced by ten percentage marks*
- For work submitted more than 24 hours late, the maximum mark will be zero.

*e.g.: a mark of 65% awarded would be reduced to 55% and a mark of 42% would be reduced to 32%.

If you have had extenuating circumstances which have affected your ability to submit work by the deadline these should be submitted in writing, accompanied by any relevant documentary evidence, to the relevant Course Coordinator. As with all extenuating circumstances it is the discretion of the examiners whether to accept these as a reason for having not submitted work on time.

If you are unable to get hold of the Course Co-ordinator before the deadline please contact either your personal adviser or the Academic Coordinator for advice.

The following College policy applies to all students on taught programmes of study:

All over-length work submitted will be penalised as follows.

- For work which exceeds the upper word limit by at least 10% and by less than 20%, the mark will be reduced by ten percentage marks*, subject to a minimum mark of a minimum pass.
- For work which exceeds the upper word limit by 20% or more, the maximum mark will be zero.

*e.g.: a mark of 65% awarded would be reduced to 55%

When the work is set it should be made clear whether or not references, quotations and bibliographies are counted.

**Examinations**

Particular note should be taken of the regulations regarding the assessment of courses and entry to examinations (see the College Regulations). If you have any doubt about these regulations you should consult your personal adviser or the Academic Coordinator.

Theory and practical examinations are mostly held within the third term, at times notified by the College. (Some 4th year exams are held jointly with M.Sc students at other times, e.g. December or January). Copies of previous years’ papers may be accessed via the Moodle web site for each course.

**Vivas**

As part of the examination process, all graduating Single and Joint Honours students in the Department are required, after the examinations in their third and fourth year, to attend an oral examination conducted by Visiting External or Intercollegiate Examiners.

**What is the purpose of the viva?**

1. If you are very close to the borderline between degree classes it allows the external examiner to make a suggestion to the exam board about whether you belong in the upper or lower class. (2) It allows the external to check our examination process and is thus part of the Quality Assurance process.

**What will I be asked?**

Anything to do with your degree, although they will have looked at either your independent project or independent mapping.

You cannot FAIL or jeopardise your mark by your performance in a viva. You cannot go down a degree class because of it.

**Do I have to turn up?**

No - but you have absolutely nothing to lose and it is rather rude to fail to turn up.

**What do I wear?**

Whatever you like, but clean and smart may make a good impression.

**Can I revise for my viva?**

Not really - but we do recommend reading through your independent mapping or project because that is what the external examiner will most likely want to talk to you about.

**Can I re-schedule my viva?**

No – it’s part of the examination process and inflexible.

**When will I know the time and place of my viva?**

At the beginning of the summer term. All vivas will occur in the department. Relevant information will be sent by e-mail and there will be a viva list on the notice board at the top of the stairs into the department.

*Earth Sciences Handbook, 2013-2014*
How long will it last? About 20 minutes.
If you have further questions of worries please see your personal adviser.

College assessment schemes
The College operates a course unit system in which each course has a value. BSc students will follow the programme for 3 years and normally take 12 units; MSci students will follow the programme for 4 years and normally take 16 units. Courses with an aggregate value of 4 units are normally taken each year. For full details of the College’s assessment and degree classification schemes please see the College Regulations.
For each degree programme in the Department of Earth Sciences, the compulsory, core and optional courses are indicated on the degree programme pathway diagrams.
Assessment:
- students will be assessed equally across all marks in each year.
- the year weighting for all BSc degrees will be 0:1:2
- the year weighting for all MSci degrees will be 0:1:2:2.

Registration for degree programmes
Formal registration for degree programmes and course units takes place on the first day of the first term of each academic year. A period of 4 weeks is normally allowed for students to change registration, although transfer to a course unit which has already commenced may not be possible.

Note that withdrawing from a course after the deadline (usually January) automatically equates to one attempt at the exam for that course. And note that normally you can only have 2 attempts at a course.

Preliminary Registration for the following year takes place in the latter part of the second term. This allows the department to judge whether or not there are sufficient registrants for 3rd and 4th year optional courses. Optional courses which fall below the registration number threshold set by the College may be withdrawn and students will be asked to choose alternative options. Certain combinations of course options may not be available due to timetable constraints; you are advised to check the current timetables, but also be aware that timetables may change from year to year.

Degree Structure
Full details about your programme of study, including, amongst others, the aims, learning outcomes to be achieved on completion, courses which make up the programme and any programme-specific regulations are set out in the programme specification available on http://www.rhul.ac.uk/coursecatalogue/home.aspx

Course registrations
You can only register for four courses in each academic year (this excludes courses which are being resat). While you have the option of changing courses within the first 3 weeks in an academic term, subject to agreement from the department, once you have submitted assessment for the course, you may not replace it with another either in that term or in a subsequent term (e.g. Spring term). Any courses that you wish to take on an extracurricular basis (that is, as extra and not counting towards your degree) must be identified at the start of the academic year or before any assessment has been completed for the course.
In Section E there is a list of all the course units currently offered by the Department of Earth Sciences. Courses in other departments may also be taken in place of optional courses as part of a degree programme. These are known as ‘elective’ courses and there are limits to the number and type of such courses which may be taken.

Change of degree programme
You are only permitted to change programmes up to a maximum of three weeks after the start of the academic year with the following exceptions:
- if the change is only in degree pathway title, which does not affect the course units taken and you are still taking the correct course units (worth 120 credits in total) as detailed in the relevant programme specification;
- if the change does affect the course units taken and you have to pick up an extra half unit in the Spring term but you would be taking the correct course units as detailed in the relevant programme specification and would have no less than 120 credits.

Students who wish to transfer from a 3-year BSc to a 4-year MSci programme (or vice-versa) can usually do so if they have met all the progression requirements (pre-requisite courses and marks at a particular level). To ensure that funding from their Local Education Authority is continued the agreement of the LEA must be sought.
Students who wish to transfer between any single honours and joint honours programmes should seek advice from the relevant degree programme coordinators and the academic coordinator at the earliest possible opportunity. Transfer is normally possible provided that appropriate core courses have been taken, but students should be aware that their choices of options in later years might be limited.

If you have any questions about the arrangements for transfer between degree programmes, contact the
Assessment offences

The College has regulations governing assessment offences which can be found on the following webpage:

http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx

Offences include plagiarism, duplication of work, falsification, collusion, and failure to comply with the rules governing assessment (including those set out in the ‘Instructions to candidates’). The regulations set out the procedures for investigation into allegations of an offence and the penalties for such offences.

Plagiarism

Definition of plagiarism

‘Plagiarism’ means the presentation of another person’s work in any quantity without adequately identifying it and citing its source in a way which is consistent with good scholarly practice in the discipline and commensurate with the level of professional conduct expected from the student. The source which is plagiarised may take any form (including words, graphs and images, musical texts, data, source code, ideas or judgements) and may exist in any published or unpublished medium, including the internet.

Plagiarism may occur in any piece of work presented by a student, including examination scripts, although standards for citation of sources may vary dependent on the method of assessment. Group working would constitute plagiarism where the discipline or the method of assessment emphasises independent study and collective ideas are presented as uniquely those of the individual submitting the work.

To identify plagiarism is a matter of expert academic judgement, based on a comparison across the student’s work and on knowledge of sources, practices and expectations for professional conduct in the discipline. Therefore it is possible to determine that an offence has occurred from an assessment of the student’s work alone, without reference to further evidence.

Marking of illegible scripts

It is College policy not to mark scripts which are illegible. If you anticipate that you may have difficulty in handwriting scripts which would lead to your scripts being illegible you should contact the Educational Support Office:

http://www.rhul.ac.uk/ecampus/welfare/disabledstudents/home.aspx

Progression and award requirements

The Regulations governing progression and award requirements are set out in your Programme Specification (http://www.rhul.ac.uk/coursecatalogue/home.aspx) and also more generally in the Undergraduate Regulations:

http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx

If you do not pass a course at a first attempt you may be given an opportunity to ‘re-sit’ or ‘repeat’ the course.

Re-sit of a failed course unit - Normally the opportunity to re-sit any failed parts of a course unit not passed will be during the following academic session. Students do not have to attend any classes. Marks for work which has been passed will be carried forward. Students are required to register to resit course units. Unless students have been informed otherwise, the mark for such courses will be capped at 40%.

Repeat of a failed course unit – if you are given the opportunity to repeat a course unit in attendance you will need to register for the course unit for the following academic year and satisfy afresh all the assessment and attendance requirements, that is, you are expected to attend all classes and redo all required coursework and examinations for the course unit. No marks from the previous attempt at the course unit are carried forward and no work from completed as part of the first attempt at the course may be resubmitted for assessment. The mark for a course repeated in attendance is not capped.

Please note that it is not possible to re-sit or repeat a course which you have passed.

At the discretion of the Sub-Board of Examiners, summer re-sits may be offered to first and second year students who would not otherwise be in a position to progress onto the next stage prior to the following year of study (but see conditions for MSci students below). Summer re-sits are only possible for the examination component of courses.

To qualify for summer rests the following criteria, which are set out in the Undergraduate Regulations:

http://www.rhul.ac.uk/forstudents/studying/academicregulations/home.aspx, must be met:

(a) the student must already have passed, been allowed, or been granted exemption from courses to a value of at least two units;
(b) the student may only be permitted to re-sit the assessment from courses in which s/he has achieved a mark of at least 30% on the first attempt, except where his/her performance was affected by documented extenuating circumstances deemed acceptable by the Sub-board of Examiners.

This opportunity may be offered only to students who would be in a position to satisfy all the criteria to progress onto the next stage prior to the start of the next academic year.

**MSci students**

MSci student starting their first or second year in and since September 2011 must meet the following requirements to progress from one stage to the next:

(a) must pass, be allowed, or be granted exemption from at least three units from each stage;
(b) must pass, be allowed, or be granted exemption from any courses denoted as compulsory for progression in the programme specification;
(c) for progression from stage two to stage three, must achieve an average, calculated to two decimal places, of 50.00% or above at the first attempt;
(d) for progression from stage three to stage four, must achieve a weighted average of 55.00% or above, calculated to two decimal places, where the second stage average is weighted as 1 and the third stage average is weighted at 2.

Any second year MSci student who does not meet the requirements to progress from one stage to the next at the first attempt will be transferred onto the BSc programme and will be given the opportunity of summer resits in order to progress onto the next stage of the BSc programme, provided they meet the criteria set out in the Undergraduate Regulations.

**Outcomes of course unit assessment**

The Undergraduate Regulations require that for a student to qualify for final consideration in a course, the Sub-board of Examiners will take into consideration:

(a) whether the candidate has satisfied the attendance requirements stated in the course specification;
(b) whether the candidate has satisfied the assessment requirements stated in the course specification.

The Sub-board of Examiners will determine an outcome and a percentage mark recorded as an integer between 0% and 100% inclusive for each candidate, as follows:

(a) an outcome of Pass (P) with a percentage mark will be returned where the candidate has gained a mark of 40% or above overall and in all elements of the assessment which carry an individual pass requirement;
(b) an outcome of Fail (F) with a percentage mark will be returned where the candidate has gained a mark of 39% or below overall or in any element of the assessment which carries an individual pass requirement;
(c) an outcome of Attendance Fail (AF) without a percentage mark will be returned where the candidate has not met the attendance requirements stated in the course specification. For the purposes of calculating the stage and final average, an AF will be treated as a zero unless a subsequent percentage mark is achieved through repeating the course in attendance.

Where a student's performance in the assessment was compromised by adequately documented extenuating circumstances, the Sub-Board of Examiners may return alternative course outcomes as set out in the Undergraduate Regulations. In some cases this will require the student to complete additional work or a resit of affected assessment. For further details please see the undergraduate regulations:

http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx

For details on the requirements for degree classification please see the section on the Consideration for the Award in the Undergraduate Regulations.

http://www.rhul.ac.uk/ecampus/academicsupport/regulations/home.aspx

**Examination results**

Please see the Examinations website:

http://www.rhul.ac.uk/ecampus/academicsupport/examinations/home.aspx for details of how you will be issued with your results:

http://www.rhul.ac.uk/ecampus/academicsupport/examinations/results.aspx

The Examinations website is the place where you can access the “Instructions to Candidates” and details of the examinations appeals procedures.

http://www.rhul.ac.uk/ecampus/academicsupport/academicappealsandcollegecomplaints.aspx

**Prizes and Scholarships**

The Department awards (or recommends candidates for) the following prizes

- Tennant Exhibition, for the best 1st year student
• Mary Isabella Webb Prize, for the best 1st year field report
• The Driver Prize for meritorious work (1st year)
• Kate and Harry Harper Chelsea Prize, for the best 2nd year student
• The Driver Prize for meritorious work (2nd year)
• Mary Isabella Webb Prize, for the best 2nd year fieldwork report
• Tennant Medal, for the best final year BSc and MSci student
• Fleet Memorial Chelsea Prize, for the best fieldwork by an undergraduate
• Frank Barker memorial prizes for the most improved 2nd, 3rd and 4th year student
• Palaeontological Association Prize
• Mineralogical Society Prize
• Parish prize, for the best Environmental Geology finalist
• Best Geochemistry Project
• Jon Wright memorial prize for 2nd year achievement
• Best Volcanology Project
• The William Smith Essay Prize, for the best report on stratigraphy. [This is open to all undergraduates in the department. The essay should be about 3000 words and no more than 5000 words long on a subject within the general area of stratigraphy. The essay must be submitted by the May examination period. GL2200 reports are automatically assessed for this prize].
• The Miers Prize is awarded to the University of London graduate with the best performance in Mineralogy.

College Prizes and Scholarships
The Mary Isabella Webb Scholarship is awarded each year to a woman graduate continuing in geological research in the College.
As well as the departmental prizes, the College awards prizes on a Faculty basis and may advertise competitive prizes.

Special Education Needs
The Department of Earth Sciences is committed to the principle of education for all and we seek to make our courses accessible to all those with special educational needs. Feedback from students who experience learning problems is a vital component of our strategy for improving delivery. So, if you can suggest ways that we can do better, please discuss them with your Personal Adviser or with the Departmental Disabilities Adviser (Dan Le Heron - room 244). All discussions are held in total confidence (subject to College regulations).

Non-academic policies
Please see the Codes and Regulations webpage http://www.rhul.ac.uk/ecampus/onlinestudenthandbook.aspx which includes information on non-academic policies, regulations, and codes of practice as well as the Student Charter which can be found at: http://www.rhul.ac.uk/aboutus/governancematters/studentcharter.aspx

Code of practice on harassment for students
This can be found on the student home pages under codes and regulations http://www.rhul.ac.uk/forstudents/regulations/home.aspx

Frequently asked questions
“I don’t understand some of the material presented in lectures and practicals in one of my courses.”
In the first instance talk to the relevant lecturer or ask one of the demonstrators in a related practical class; if you still have problems, talk to your personal adviser. You may also find that one of your class colleagues can help explain things to you.

“I’m having problems coping with the workload.”
Talk to your personal adviser as soon as you feel things are getting too much; your personal adviser will be able to offer advice and guidance to help you out, but the
longer that you leave it, the more difficult it is to catch up.

“I think I would like to change to a different degree programme.”
Your personal adviser, the relevant degree programme coordinator or the academic coordinator will be happy to discuss the options for different degree programmes.

“I think I am going to be late handing in some coursework.”
The only circumstances for granting extensions for coursework are medical or serious personal circumstances, and if such a situation exists, you should discuss it with the relevant coursework supervisor as early as possible. In all other circumstances, a penalty for late submission will be applied. Please note that technical problems such as computer system failures are rarely accepted as excuses for late submissions.

“Illness has prevented me attending lectures and practicals, or it has affected my exam performance.”
Inform the department of the problem as soon as you possibly can by telephone or e-mail. It is YOUR responsibility to make sure that this information gets to the Chair of the Exams Sub-Board via the Departmental Administrator. If you are ill for a short period (up to 5 days) complete the Notification of Absence Self Certification (see page 11) and hand it in to the Departmental Office. Longer absences (more than 5 days) will also require a medical certificate obtainable from your doctor. Contact the staff involved in all the classes you have missed and your personal adviser for advice on how to catch up on the material that you have missed.

“I have two coursework deadlines which are close together.”
Ask the relevant staff member to allow you some flexibility. If the request is reasonable then it should be possible to change the deadline.

“I have missed an assessed practical or exam”.
Explain the reasons as soon as possible to the course coordinator, copied to the Departmental Administrator. If the reasons are acceptable, you are likely to be required to carry out an alternative assessment soon after.

Teaching and Research Interests of Academic Staff

A list of staff interests is given below, to guide students seeking advice for project work or future careers.

Dr Juergen Adam - Coupled tectonic, climate and surface processes; Geodynamic modelling of thrust belts, accretive and non-accretive convergent margins; Salt Tectonics in passive margin sedimentary basins; Physical simulation of rock deformation from basin to fracture scale; Fault & fracture mechanics, Tectonic modelling of structurally complex basins and reservoirs; Neotectonics and geohazards at continental margins and intra-continental strike-slip faults.

Dr David Alderton - Mineralogy and chemistry (especially fluid inclusions and stable isotopes) of ore deposits associated with igneous rocks. Rare metal mineralisation (Au, Ag, Sb, Te). Mining-related pollution in sediments and water.

Prof Peter Burgess – Carbonate and siliciclastic sedimentology; numerical modelling of sedimentary systems; stratigraphy – sequence stratigraphy and statistical analysis of data

Dr Kevin Clemitshaw - Sources, sinks and trends of gaseous air pollutants that impact on health and climate. Tropospheric chemistry and measurements of nitrous acid. Atmospheric chemistry, transport and impacts of organic nitrates.

Prof Margaret Collinson - Tertiary floras, vegetation and climate; floras of the Cretaceous/Tertiary boundary event; evolution of wetland communities; fossil history of mammal/plant interactions; megaspore ultrastructure and the evolution of heterosporous plants; palynofacies; organic geochemistry and chemical composition of plant fossils and their role in kerogen formation.

Dr Howard Falcon-Lang - the evolution of terrestrial ecosystems and palaeoclimates. Current projects include the origin and early evolution of reptiles in mid-Carboniferous, the collapse of the first rainforests in Late Pennsylvanian times, and the explosive appearance of flowering plants in the Cretaceous Period.

Dr Rebecca Fisher - Atmospheric chemistry and physics: measurement of atmospheric greenhouse gas concentrations; use of stable isotopes to identify sources of methane and carbon dioxide; UK and Arctic methane emissions

Dr James France - Sources of methane emissions to Arctic regions and isotopic fingerprinting of methane sources. Optical properties of snow and the effect of impurities on snow physics and snow chemistry. The habitability of Mars.
**Prof Agust Gudmundsson** - Volcanotectonics, dyke emplacement and caldera formation; Seismotectonics, development of seismogenic faults; Reservoirs of oil, gas, ground water, and geothermal water; Rock fractures in geological processes


**Dr Martin King** - Snow and atmospheric chemistry and physics; radiation transfer; identity, sources and quantity of organic atmospheric aerosol; computational ab-initio studies of silica-organic molecule complexes.

**Dr Dan Le Heron** - Evolution of large sedimentary basins and sedimentary geology (clastics). Saharan geology. Glacial geology and climatic change in the pre-Cenozoic record. Applied glacial geology and glaciogenic hydrocarbon reservoirs. Glaciation, deglaciation, and black shale accumulation.

**Dr David Lowry** – Use of stable isotopes to understand geological, environmental and atmospheric problems, including sources of greenhouse gases in the atmosphere, formation of mineral deposits and intrusions, and development of the Neoproterozoic rocks of Scotland. Development of new instrumentation for greenhouse gas analysis.

**Dr Christina Manning** - Application of isotope geochemistry to the identification and evolution of mantle sources beneath Iceland. The use of mineral chemistry as a recorder of magmatic evolution.


**Prof Martin Menzies** - Magmatic processes and crust–mantle geodynamics, examining xenoliths from variety of tectonic environments; lithosphere evolution tectonic processes and basin development (eg. Europe, Western USA, Red Sea).

**Prof Jason Morgan** – Large scale geodynamic processes at subduction zones, spreading centres, hotspots and passive margins, often using marine geophysical methods to test model hypotheses.

**Dr Wolfgang Müller** - Isotope geochemistry applied to the earth sciences, archaeology and anthropology: Human subsistence reconstruction (migration and palaeodiet) from biominerals (teeth); U-Th-Pa disequilibrium dating. Past heavy metal pollution (e.g. Pb) as recorded in teeth; Isotopic tracing of metal (artefacts). Earliest Archaean crust (>4Ga). Time scales of geological faulting. In-situ analysis by laser-ablation-(MC)-ICPMS.

**Prof Euan Nisbet** - Komatiites and mantle evolution; the global carbon cycle both past and present; global environmental change.

**Dr Marta Pérez-Gussinyé** - Marine Geophysics, Geodynamics, Rifting and formation of continental margins, intra continental deformation

**Dr Steve Smith** - Risk characterization of natural, anthropogenic and engineered particulates in the environment; their adsorptive characteristics for metal and organic contaminants and their surface physical and chemical characteristics.

**Prof Matthew Thirlwall** - Geochemistry, particularly combined chemical Sr-Nd-Pb isotope studies of subduction related magmas, crustal contamination processes and ocean island magmatism. Geochronology and magmatism of the Caledonian Orogen. High precision analytical techniques including thermal ionisation mass spectrometry, isotope dilution and XRF.
Dr Paola Vannucchi – Structural geology. Global tectonics and convergent margins. Earthquake geology. Geology of Italy.

Dr Dave Waltham - Numerical modelling of seismic data, hanging wall and footwall deformation; carbonate platforms; evaporites; simple clastic systems.

Dr Ian Watkinson – Structural geology and major faults of SE Asia. Strike-slip faults.

SECTION B: STUDYING EARTH SCIENCE

Department of Earth Sciences ethos
In Higher Education, our foremost objectives are to help you to realise your full intellectual potential, to raise your personal expectations and to strengthen your intellectual self-confidence. The Department has set itself the following goals in relation to undergraduate teaching:

• to create an atmosphere of individual academic enterprise and self-reliance in which each student is challenged to develop his or her intellectual powers to the full.
• to develop a teaching culture that offers every student the means to learn most effectively, according to individual ability.
• to cultivate in students a capacity for logical, independent and critical thought, and an ability to propose, test and refute hypotheses objectively.
• to stimulate an interest in, and a wide-ranging understanding of, the mechanics of Earth Processes and history, how they are analysed, measured and modelled, and how they and their products may be utilised to the benefit of humanity.
• to enable students to develop technical competence in field and laboratory data analysis and computer techniques, to serve as a foundation for careers as professional geoscientists.
• to enable students to develop transferable skills (personal, numerical, information and communication) to equip them for successful careers in science and in other disciplines.

What we expect from you and what you should expect from us

A satisfactory programme of study at university requires both the students and the department to enter an informal ‘contract’ of obligations and expectations which all should seek to abide by.

What you can expect from us

The Department is committed to effective teaching, but we judge our success in terms of how well you learn. We will do all we can to stimulate your interest in Earth Science, to make the aims of each course clear, to train you by means of interesting and fulfilling practicals, fieldtrips and projects, to provide support that is matched to your individual needs, and to monitor and guide your progress. We hope our enthusiasm for the subject will prove infectious, and will stimulate you to pursue your studies energetically. Most of all, we hope you will find the Department a friendly, supportive and stimulating place in which to work. Our interest in you will not come to an end at the graduation ceremony.

As a student you can expect the department to:

• Provide lectures, practicals and field courses in a series of course units that will make up your degree programme
• Take reasonable steps to assist students who are disadvantaged through illness or other problems
• Take steps to ensure that your working environment is safe, both in the department and in the field
• Nominate a personal adviser who will provide tutorials and act as your point of contact with the department
• Assess and examine your work
• Provide verbal or written feedback on coursework where appropriate
• Organise a schedule of fieldwork appropriate for your degree programme
• Subsidise the cost of most field courses which are part of the degree programme
• Provide a feedback mechanism for student evaluation of courses through questionnaires
• Provide reasonable notice of all coursework deadlines, changes to programmes and fieldwork arrangements by electronic mail or display of notices
• Treat all students in a fair and just manner without any form of prejudice

What we expect of you

If your degree course has not challenged you to grapple with difficult concepts, to become skilled in new and demanding techniques, and to push your intellectual powers to the limit, then you will not have used your opportunity to the full. Employers of graduates are
interested not only in the knowledge you have acquired (though knowledge is obviously relevant to careers in Earth Sciences), but also in personal qualities like self-reliance and initiative, and in your capacity to think rationally and independently, to apply scientific principles to new problems, to work in a team, to write clear reports within a firm deadline, and so on. These are qualities that develop from your efforts rather than being taught. They depend on many factors, among them the energy you put into your studies and the resourcefulness with which you pursue your career goals. Nevertheless we want you to enjoy your studies here; if you enjoy what you do, you will work harder and learn more effectively.

As a student you are expected to:
- Attend all lectures, practicals and field courses unless you are ill or have other acceptable cause for absence
- Keep the department fully informed of any factors that may seriously affect your studies
- Follow all safety instructions in the field and laboratory
- Attend all tutorial sessions arranged with your personal adviser and keep him/her fully informed of any problems which may affect your studies
- Complete all coursework by set deadlines and attend all examinations
- Behave responsibly in classes and ensure that your actions do not distract others (e.g. phones are switched off and no inappropriate computer use).
- Behave responsibly and in accordance with all instructions from staff whilst in the field
- Pay the student contribution to field courses in instalments by the published dates
- Fill in all course questionnaires (anonymously) and provide constructive feedback
- Check e-mail accounts regularly (preferably daily)
- Always behave in a manner that will not bring the department or college into disrepute.

How you will spend your time

Lectures
In any science degree course, lectures provide the main avenue for transferring new knowledge and understanding. You will have to adapt to a variety of styles and speeds of lecturing. Your job is to condense as much as you can of the material that the lecturer presents, both orally and in written form, into a set of coherent notes that will be intelligible months or years later. To succeed in this, you will need to read the notes through shortly after the lecture (ideally the same day) and clarify any uncertain points with the aid of a textbook, or using other sources recommended by the lecturer. In more advanced courses, you may also be referred to articles in scientific journals.

Lectures merely define your learning agenda - they are no substitute for individual study, and it’s your job to fill in the gaps in your notes, and to do enough library or textbook reading to grasp the material covered. Bear in mind that in science understanding is valued at least as highly as factual knowledge.

All lecture courses in the Department are examined, and poor attendance may lead to you failing the course unit concerned. If you miss a lecture, for whatever reason, copy the notes up from a friend at the earliest opportunity; make sure you understand the notes fully, and ask the lecturer concerned about any points you can’t follow. It is courteous to let the lecturer know in advance if you expect to be absent from a lecture. Keep your lecture notes carefully filed in a ring binder, together with all the relevant handouts, reports and exercises. Do not discard notes as soon as you have passed the course unit; remember that parts of your final-year assessment will examine material covered in earlier years.

Each lecture/practical course is the responsibility of a Course Coordinator. Speak to him or her if you are having difficulty with any part of the course.

How to address lecturers
Earth Sciences is an informal department, and you will probably be on first-name terms with most staff by your second or third year. When you first arrive, however, your lecturers and your personal adviser will usually indicate to you how they prefer to be addressed until you get to know them well, so please respect their wishes. Formal terms like ‘Sir’ are never used.

Reading
Independent reading is an essential ingredient of a good honours degree. Science thrives on controversy and on fresh insights, and although in lectures we try to embrace opposing points of view and introduce you to stimulating new ideas, we cannot present the arguments as vividly as the combatants themselves: there is no substitute for reading the books and research papers in which the story unfolds year by year or month by month. To gain a good degree, therefore, it is essential that you read widely, to enhance your understanding, to broaden your knowledge of the science, and to keep abreast of progress.

Do I need to buy all the recommended

textbooks?  
Buying textbooks can be an expensive commitment, and we accept that it is not practical to purchase all recommended book(s) for every course you take. Your priorities should be:  
• Reference manuals used in practical classes, particularly in subjects such as mineralogy. Without these, you will be severely handicapped.  
• Textbooks for core courses in the first and second years.  
• Texts covering course(s) which you find most difficult.  
Always examine a book carefully to ensure that it meets the needs of the course before spending money. You can help your book budget go further by arranging with a friend to buy different books and share, looking around for second-hand opportunities or recovering some of your outlay by selling books that you no longer need to fellow students. If you plan to sell a book, avoid writing or highlighting in it.

Journals and magazines  
You should aim to keep abreast of major developments in Earth Sciences by browsing through current issues of more accessible science and geology journals such as New Scientist, Scientific American and Geology Today; by the time you reach the third year, you should be having a regular look at Nature, Geology and other journals.

Coursework and practical training  
Practical work lies at the heart of all core courses in the Department, and it usually takes the form of a class that complements the preceding lecture. Practicals test and extend your understanding of course content, train you in essential skills, help you to become familiar with minerals, rocks and fossils, and acquaint you with modern methodology (e.g., in geochemistry and in geophysical exploration). Many practicals are so designed that you learn through investigation and are able to draw scientific conclusions for yourself, thereby gaining confidence in your own powers of reasoning.

You should generally take with you to every practical class:  
• the lecture notes for the course concerned;  
• notes from previous practicals in the course;  
• any relevant textbook (e.g. for mineral identification);  
• relevant equipment (e.g. hand-lens, knife, protractor, coloured pencils);  
• a calculator;  
• where specified, a practical notebook with graph pages.

In many courses the coursework is assessed, so you should take care to hand it in by the deadline specified. Take careful note of advice written on your script or practical book when it is returned to you. All marked coursework should be carefully filed for future reference and revision.

It is natural to discuss what you are doing in a practical with your neighbour, but it is very important that what you hand in is your own work and collusion will not be tolerated. We cannot correct your misunderstandings and errors if you simply copy someone else’s work, even though in the short term this may gain you better marks. For the same reason, do not simply write down what a demonstrator tells you; make sure you understand it first. Do not be afraid to question what you are told. Do not be afraid of reaching the ‘wrong’ answer. In the first place, there may be more than one ‘right’ answer. Secondly, one learns more from bona fide errors than from getting things right all the time.

Catch up in your own time with practical classes you miss; for nearly all practical classes there will be a practical script outlining what you have to do, which can be obtained from the lecturer concerned or downloaded from the Earth Sciences server. If your absence is legitimate, the class supervisor will normally agree to mark your work, unless it is excessively late.

Most taught courses allocate a proportion of the marks to assessed coursework of various kinds. This may be work carried out in regular practical classes, or it may take some other form such as a project or literature report. Take particular note of the deadline for handing in coursework: you are certain to be penalised if it is handed in late.

Computers and Computer skills  
Computer Centre  
All students must be registered at the Computer Centre to allow use of the College Computing facilities. The Computer Centre provides a wide range of training courses for students on many aspects of computing. For further information about all aspects of computing go to the Computer Centre where general and specific advice is available.
Computer skills
Handwritten reports are things of the past; today’s graduate is expected to possess IT and presentational skills, and we expect you to develop these skills using the hardware, software and training provided by the Royal Holloway Computer Centre. The Computer Centre runs several courses which you are strongly advised to take. These are available in a number of different formats targeted at students with different skill levels, from complete novices through to experienced PC users. The Computer Centre operates a number of PC labs dotted around the campus, including the Queens Annexe (room 141). You are entitled to use any of the computer laboratories on campus provided they are not in use for teaching. You should have a user ID number from the Computer Centre in your pack of initial registration details.

Some Earth Sciences courses involve using teaching packages and spreadsheet analysis of data, and you will be expected to use a word-processor for report preparation; the Department demands a high quality of presentation for project reports. You will often be encouraged to search for information using the World Wide Web (WWW) - but see the important notes later.

The applications packages that you use (Word®, Excel® and so on) can be accessed from the network server. The documents that you generate (reports, spreadsheets, etc.) will have to be saved on your own disk or CD. When saving a document, it is vital that you ‘back up’ on a second disk, in case the first one gets corrupted; not doing so may mean the loss of your work.

Numeracy and quantitative methods
Earth Sciences is a quantitative science, and in the course of your studies you will be required to manipulate equations, process numerical data, plot graphs and become generally conversant with quantitative methods of analysis. If you haven’t got A (or AS) level Maths, don’t worry: you will receive a gentle introduction in the first year. Ask your Personal Adviser for help if you get out of your depth.

Languages
The College Language Centre provides basic proficiency courses in several European languages for students without language A-levels. You are strongly encouraged to take this opportunity during your three years at Royal Holloway; your overseas field courses give you a wonderful chance to build on the language skills you learn, which may open up career opportunities that would otherwise not be available to you.

Library
Earth Sciences textbooks and journals are housed in the Bedford Library together with a range of general scientific works. Information concerning other University of London library holdings is available on designated computer terminals in the Bedford Library and in the PC Lab. Students are warned that the removal of books from the Library without authorisation is an offence that may lead to the offender being expelled from the College. An induction course on the use of the library is provided for all new students.

Using the library
When you arrive at College you will automatically be registered with the library and given a personal PIN number. Remember this, as you will need it to reserve books. In the Library there is an Enquiry Desk: use it freely and do not be afraid to ask. The Librarian in charge of Science is Mr. Adrian Machiraju who is glad to help solve particular questions for geologists. He can be contacted by e-mail (a.machiraju@rhul.ac.uk).

Books
The collections of geological books are housed in several places in the Bedford Library, depending on their size and availability.

All books are catalogued according to the Dewey Classification System, so books on a given topic will usually be located in the same shelf area. The majority of the Earth Sciences book collection on Normal Loan (see below) will be found on the top floor (Level 3) reading room. Larger Earth Sciences books (Quarto and Folio) are kept on separate shelf units on Level 1. Be sure to look at these as well. Do not give up: if you cannot find the book you need, ask Library staff to help you locate it.

Books that are heavily used may have been classified as Restricted Loan (meaning they can be taken out for only a few hours at a time). These are kept in a separate section behind the Issue Desk on the entrance level (Level 2). Some journal articles used for specific courses are also kept here. Journal articles for some inter-collegiate courses are kept in box files. To find out the precise shelf location of a specific book, use one of the Library PCs or a PC in a computer lab and click on ‘Library’ in the Royal Holloway home page to access the Library page (http://www.rhul.ac.uk/information-services/library/).

Books are classified into three categories for the purpose...
Periodicals
For more advanced studies most information will be found in journal articles. The journal holdings are adequate but bear in mind that if a part of a journal has been put back in the wrong place it will be difficult to find again in the future: take care! Note also that journals in ‘electronic format’ are becoming increasingly available and the library currently has access to (amongst others) all Elsevier journals.

Earth Sciences journals are kept together on Level 1. Here you will also find general science journals like Nature and Science, and abstracting journals.

Do note that we have some runs of journals to which we no longer subscribe, so even if a title is not on the current shelf we may still have the article you want.

Specialist Collections
The Bedford Library contains some specialist collections, mainly for postgraduate and staff use, e.g. the South-East Asian collection. Please ask if you require access.

Tracing the article that you need
If you are searching for journal articles to use in a report there are several ways you can do this. You may wish to browse through the current issues of journals that we hold. If you find a relevant recent paper then look in its bibliography to find earlier references.

On-line Bibliographic Searching
For more detailed bibliographic searches you can use an on-line computer searching facility. Ask at the Enquiry Desk or look at the library web pages for details of how to use the various ‘search engines’ available on-line.

If you experience extreme difficulty in finding a book or journal (especially if you believe something is missing from the Library) then see Prof Robert Hall who is the Earth Sciences staff member with responsibility for Library matters.

Donating books
As you will discover, popular textbooks are always in short supply. More geological books are published each year than we can possibly purchase. We run a scheme whereby students can donate used textbooks to the Library, or donate money towards the purchase of a book. An inscription will be inserted into the front of any book given in this way: ask in the Department Office for details of how to do this.

Writing literature reports and project reports

Success in most professions depends on being able to write concise, well structured, informative reports or papers, which provide an important avenue of communication with your manager, your client or the scientific community at large. Without a good command of written English your professional opportunities may be limited. At Royal Holloway, we expect you to work hard to improve these vital writing skills from the very start of your undergraduate career, and we take every opportunity to help you, especially if English is not your first language or you are dyslexic.

The training you receive in writing good scientific English will be based on written work in the form of literature reports on topics that you have researched in scientific literature written for particular courses or for your Personal Adviser: your Personal Adviser will provide initial guidance on researching your report, and constructive feedback on your work. In the third and fourth years you will have to write extended project reports that, in addition to summarising the current state of published research on the topic in question, will report your own project objectives, measurements and conclusions. Some first and second year courses also require project reports at a less demanding level.

Each literature report and project report will have to be prepared to a deadline, and must meet professional standards of presentation. The marks for literature reports and projects contribute substantially to your final degree grade, and they may also be scrutinized by External Examiners. Moreover, work of this kind provides an important indicator for Personal Advisers when they write references in support of your job or postgraduate studentship applications in advance of your final degree grade. It is therefore important to achieve the highest standards that you can.

This section outlines the standards expected for literature reports, project reports and the equally important professional skills of effective oral and audio-visual communication (useful when preparing seminars). More detailed guidelines will be given during your time studying here.

Quotations and sources
It is most important that you acknowledge any work by other people that you have used in your report. You may wish to quote a passage directly from the text of a paper or book (in which case inverted commas should be used
to identify the quoted passage), or reproduce a figure or table, or merely use information or data from the publication in your own synthesis. If you wish to quote a passage directly, it must be short (ideally no more than 2 sentences), in inverted commas, referenced, and such quoted passages should make up less than 5% of your total text. In all such cases, you must refer in your text (or in a relevant figure caption) to the published source of the information, for example as 'Bloggs (1994)', and provide bibliographic details in your reference list, e.g. Bloggs, J. 1994. Organic pollutants in groundwater. Environmental Geochemistry. 23, 1-16.

Internet sources: You should not place too much reliance on internet sources of information. Most of these are unregulated and not subject to the same rigorous editing as is the case with books and journals. It may be appropriate to use the occasional image or diagram, but for factual information it is almost always much better to consult a written source.

Plagiarism (also see earlier section)
Plagiarism is the presentation of another person’s work without adequately identifying it and citing its source. It may exist in any quantity, in any published or unpublished medium (including the internet) and could exist as text, graphs, images or data. Therefore all work presented for any form of assessment must be entirely the student’s own work, except in cases where joint reports from team exercises are assessed.

Plagiarism can occur in any piece of assessed work. If work is copied from another student or copied from another source without acknowledgement, this is considered to be plagiarism. Similarly, it is considered to be plagiarism if more than a single phrase is imported from another text without quotation marks and a source. And plagiarism can be deliberate or unintentional.

The Department treats plagiarism as a very serious offence. Instances of plagiarism will be reported to the Head of Department who will consider whether further penalties should be applied or the matter referred to the College authorities. Students have a right of appeal to the College against penalties imposed by the department.

To avoid suspicion of plagiarism, and furthermore to lend legitimate authority to what you write, always acknowledge EVERY source of material that you use, however small it may be. And it’s not a good idea to ‘self-plagiarise’ - i.e. use the same piece of work for more than one course. We don’t like this!

Writing simple, clear English
Your aim should always be to write lucid, concise English that is easy to read. The general rules are:
• Map out an outline of what you want to say. Starting to write without a clear mental or written image of the finished article usually leads to a circuitous, turgid product. Always begin by making a list of the topics to be covered, or the points you want to make, and devote a paragraph (or possibly several paragraphs) to each topic.
• Keep the language simple. Eschew (!) fancy words whose meaning you do not fully understand. (However, don’t let this stop you enriching your genuine vocabulary.) If in doubt of the meaning, use a dictionary.
• Be concise. There is no merit in length for its own sake. Inflating a report with repetition or circumlocution may only emphasise how little you have to say. Aim at a style that is lean and informative. Keep sentences short.
• Adjust the style of your writing to the task in hand. An exam answer can be written in note form as long as the meaning is clear. A letter enquiring about possible job opportunities should be formal but fluent.

You will find the Oxford Guide to the English Language by E.S.C. Weiner and J.M. Hawkins (OUP, 1985) a useful source of reference on good written English. It includes a dictionary.

How to write a good report
A scientific report is an exercise in lucid, concise scientific writing on a topic, based on primary data or on secondary sources. Here are some general guidelines to help you begin in the right way. They apply to all reports, exam answers, and other written work.

DO’s
• Read the title carefully and make sure you know what is required.
• Sources of information. Research your literature sources in good time. You may be given a list of references, or a single key reference from which other sources of information may be gleaned. Delays may arise (e.g. while the Library recalls a book from another reader).
• Carefully plan the structure of your reports before you start writing. A disordered structure leads to repetition and the omission of important aspects; it also makes the report much harder to read. Decide on the extent of subject matter to be covered in your report, break it down into sections, each under an appropriate heading, and sketch in the individual topics you intend to include under each heading. These headings should appear in the final report to help the reader to appreciate the structure of your report.
• Check the relevance of the content before writing the final version.
• Illustrate your report with appropriate diagrams or tables. You should cite the source of each diagram (or table) where appropriate.
• Ensure that the facts are presented before the speculation (unless the purpose of your report is to compare two conflicting hypotheses in the light of available data, in which case the theories can be summarised first).
• Avoid woolly generalisations. One concrete example is worth a page of generalisation.
• References: finish off the report with a list of the sources of information you have actually used and have specifically referenced in the text.
• Read through the report before handing it in: there will inevitably be mistakes that need correcting. Check the spelling using a spell-checker on the word-processing package, but remember that a spell checker can only identify incorrect spelling, not incorrect words. Make sure the punctuation is correct and conveys the meaning you intend.
• Stick to the stated word limit. Add the number of words to the report. There will be a penalty for exceeding the limit.

DON'Ts
• Don’t put off your report writing until the night before the deadline.
• Don’t pad out a report with irrelevant material and repetition.
• Don’t use fancy words unless you are sure what they mean.
• Avoid using personal terms (‘I’, ‘we’, ‘our’, etc.).
• Don’t string sentences together with commas.
• Don’t print to the edge of the page. Leave a margin of at least 2.5 cm on left and right for binding, and marker’s comments and use a line spacing of 1.5. Don’t hand in your report just as a bundle of loose sheets - bind or staple them.

Oral Presentations
In some courses you may be required to give a talk on material that you have researched. Bear the following points in mind when preparing an oral presentation as these aspects will most likely be assessed:
• Assess how much material you can present in the time allowed. Stick to the guidelines and practice your talk a few times in private to check on the length.
• Select the subject matter carefully: pick out the topics that you think your audience will find the most interesting. Make sure that there is a clear and logical structure and list the important headings as ‘bullet points’. Ensure there is adequate scientific quantity and quality in the talk.
• Know your subject inside out. Last-minute preparation of material for oral presentation is rarely successful. Be prepared for questions.
• Never just read verbatim from written text - a deadly experience for your audience. Spoken and written English are quite different animals. Prepare skeleton notes for your talk, and then just speak naturally to your audience using the notes to prompt you only when necessary. Try to face the audience during the talk. Try to get a colleague to check that you can be heard clearly at the back of the room.
• Prepare informative presentation slides showing simple figures, tables or ‘bullet point’ lists to help your audience to assimilate the information. Make sure your slides are easy to read from the back of the room. Do not pack in too much detail. Check your colour schemes.
• Provide sources for all of the information and images in the talk.

Literature Reports
Through writing a literature report you will learn how to research the scientific literature, compile a review of recent work or ideas, and weigh up the merits of conflicting arguments and theories. A literature report may form a major part of the assessment for a given course unit. When a marked report is handed back, take note of the marker’s comments so that you can improve the standard next time.

You will usually be given a title (possibly a choice of titles) indicating the topic you are to write on and possibly a few key references to start you off; you will need to look at those sources to track down further references that may be of use to you. Alternatively you may be expected to use the bibliographic resources of the Library.

Objectives of the literature report
A literature report should review recently published ideas and research on a topic of current interest. A good literature report is a critical synthesis of current thinking, weighing up all sides of the debate, their strengths and their shortcomings. The mark awarded will take into account the analytical content of your literature report.

You should initially discuss the topic with your supervisor, who will outline its scope and may provide a series of references to get you started. You should determine straight away whether they are available in the Bedford Library - if not you will either need to read them at another library in London, or ask for them to be obtained by inter-library loan.

Planning your work
Note the deadline for submission of the report. The
deadlines is waived only in serious cases (e.g. illness supported by a doctor’s certificate); in all other circumstances, you will be penalised for late submission. To avoid this you should, at an early stage, draw up a timetable for preparing the report:

- List, in the light of your reading, the main headings you intend to cover and arrange them into a draft ‘Table of Contents’.
- Write the text (see following section), including table of contents, references and (last of all) the abstract.
- You are strongly advised to write the text directly on a PC. This makes successive drafts easy to edit and correct. Check your final draft carefully, ensuring it does not exceed the required length.
- Get a literate friend to read your draft text for spelling/punctuation/grammatical errors.
- Prepare diagrams.
- Check for, and correct, typing errors. Number pages and enter page numbers in the table of contents.
- Print your final version on a laser printer or ink-jet printer.

**Length, structure and style.**
The literature report should not exceed the stated word limit (excluding references). (But check - is it a word limit or only guidance?) It should be organised so that the facts are given before the speculation. A typical structure might be:

- Title page (and add the number of words you used)
- Abstract (<300 words). As it is a summary, write this last.
- Table of contents with page numbers.
- Introduction (10%): objectives of report; background literature.
- Descriptive / factual part (50%).
- Interpretative part (30%): comparing models, discussing controversy, new correlations, recommendations, etc.
- Summary (10%). Emphasise your conclusions; do not re-cycle the abstract.
- List of references (in alphabetic order by author).

Great importance is attached during marking to the clarity, style, spelling, punctuation and accurate typing of the text. This is your chance to show you can prepare a report of a professional standard - take it seriously.

**Abstract.**
Immediately after the title page there should be an informative abstract, summarising in about 300 words the factual content and conclusions of the literature report. *(It is not an introduction to the project)*. Write the abstract

last, so that it is a true summary of report contents.

**References.**
References cited in the text should correspond exactly with those appearing in the reference list. Use the reference style recommended for the *Journal of the Geological Society of London* (look at any recent issue). If you figure a diagram/table from a book/paper, *always* quote the source (see ‘plagiarism’). Check that all references cited (including those referred to in figure/table captions and appendices) are listed in full in the reference list.

**Typing.**
The literature report must be typed in 1.5 spacing (except references). The title page should list the title of the report (in capitals), your full name, your supervisor’s name and “GLxxxx Literature Report, Department of Earth Sciences, Royal Holloway, University of London”, followed by the academic year.

**Figures and Tables.**
Diagrams should be drawn in ink or printed from computer. Photocopies of figures (but not captions) are acceptable provided the source is cited; *always* write your own caption. Each diagram should have its own caption typed on the same page, beginning with ‘Figure X’. The same applies to tables: each should have its own caption beginning ‘Table Y’. Do not refer to tables as figures. The source(s) of each figure or table, or the data from which it is derived, should be quoted in the caption. Little credit is given for photocopied figures; you are encouraged to devise original figures illustrating your own analysis, interpretation or model.

Take care to back-up your files as a precaution against corruption, accident or loss and save your file regularly to both disks. Take care not to confuse different versions of your document. Before printing your literature report, consult the ‘Standard of Presentation’ section following ‘Project reports’; use Print Preview to check page format and page breaks. The Department requires two copies of some third and fourth year reports; print a third copy if you wish to keep one yourself. Some reports must be submitted with a specific cover and title page showing your name, report title, course code and date submitted.

**Project reports**
A project is a piece of practical scientific research that you will carry out independently or as part of a group. The topic is normally proposed by the member of staff who will supervise it, but the Course Co-ordinator may consider an alternative suggestion from you. Through gathering together the necessary background information, planning the project, booking laboratory time, carrying out the experiments or analyses, and drawing your own objective conclusions from the data, you will gain a valuable personal appreciation of scientific research, and
experience some of the rewards and frustrations. Carrying out a final-year project will help you to decide whether you want to go on to do postgraduate research.

You should buy a field/laboratory notebook specifically for the project. Make sure at the beginning that you fully understand the scientific objectives, and write them down in your notebook. Use the notebook for making notes on papers you read, and for all other project information.

The project will be assessed on the report that you write on it, which should be set out along the same lines as a literature report (see previous section). Keep within the specified maximum word length. It should be structured so that the facts are given before the speculation, and should be organised under relevant headings.

A typical structure might be:
- Abstract - around 300 words. Always write this last.
- Table of contents with page numbers.
- Introduction (10%): Objectives of the project. Background literature.
- Fieldwork (if any).
- Experimental methods used (5-10%).
- Factual commentary on the data (30%): note correlations, differences, etc. Except for relevant summary tables, raw data belong in an appendix.
- Interpretation of data (30%): comparing and testing hypotheses, models, proposing new models, speculation, etc.
- Summary of the conclusions (10%) and avenues of future research.
- Acknowledgements to people who helped you.
- References cited (including those cited in tables, figure captions etc.)
- Any appendices listing numerical data, etc.

It is essential that the appropriate SI units are given beside every numerical value quoted.

Field mapping reports
Separate instructions will be given to you on the preparation of geological field sheets, maps, cross-sections and mapping reports for assessment.

Standard of presentation
Employers expect the graduate scientist to be capable of preparing documents and presentations to the standards of a professional printer. As an Earth Science student at Royal Holloway you have access to up-to-date IT hardware and applications packages, and you are strongly encouraged to refine such skills in the interests of your future career.

Any professionally printed document such as a scientific book or paper will indicate the style to aim for. Here are some hints on setting up your PC-based Word® document to get a professional result. Do not be afraid to experiment, but save your document first, just in case!

Margins. Set margins to at least 2.5 cm at left, right, top and bottom.

Font. The best general-purpose text font (typeface) to use with a laser printer is Times 12pt. Do not be tempted to use some of the more unusual fonts which are often not so easy to read.

Line spacing. A line spacing equivalent to about one-and-a-half times the font height provides a pleasing appearance.

Headings. Use bold and/or italic and a larger font to emphasise headings and use a consistent heading hierarchy for main, secondary and third-tier headings. Do not use underline. Each heading type can be set up initially as a Style (Format menu, Styles).

Figures and Tables. Word® allows computer-generated figures like Excel® graphs to be pasted in using the ‘clipboard’. It also offers a Table format, but numerical tables may be easier to prepare and print from Excel®. Mathematical formulæ may be set using the Formula facility (see Help).

Print Preview (File menu). Print Preview shows an image of the current page as the printer will print it.

Preparing a curriculum vitae (‘CV’)
A good curriculum vitae is important when you are seeking a job in competition with other applicants. A personnel manager commonly faces tens or even hundreds of applications for a single job, so at the first short-listing stage he or she may spend only a minute or two looking at your c.v. or form. It must therefore be concise, informative, carefully prioritised and neatly laid out if it is to succeed in getting your name on to the short list.

Use a PC for drafting your c.v., refining it in the light of your Personal Adviser’s comments, up-dating it to include recent experience, and printing a high-quality copy to create a positive initial impression. Include name, date of birth, home and term-time addresses with phone numbers if available, e-mail address, A-level or other entry information, your degree course with dates and course options, activities or interests in which you have excelled, shown initiative or borne responsibility, and the names of two academic referees. (Look at the table in section G to remind yourself about the skills you should have picked up during your period of study.) Confine yourself to established facts. Leave it to your academic referees to predict the class of degree you may get.
Basic Study Skills

- Use initiative. Don’t just wait for things to be given to you - go and find what you need for yourself.
- Keep a diary and use it to plan your days/weeks/year, and to note changes of schedule.
- Keep a daily eye on relevant notice boards and check your e-mail account regularly.
- Play an active part in Department events, enjoy the social life and get to know staff well.
- If illness or other circumstances prevent you from attending exams, fieldwork or a significant numbers of classes, ask the Health Centre to send a note to the Department Academic Co-ordinator. Illness cannot be taken into account in your overall assessment unless the Department receives a medical certificate.

Lectures

- Concentrate on understanding the lecture. Give priority to getting the key words down in the right order. Then you will be able to make sense of the notes with the aid of a book later.
- Lectures merely define your agenda - it’s your job to fill in the gaps in your notes, and to do enough library or textbook reading to understand the course material. Merely knowing things is not enough.
- Each evening, consolidate your notes from that day, from tutorials and lectures. Write in additional headings to structure the notes. Use reference books straight away to sort out problems and fill in blanks. Do not allow poorly written notes or non-understood material to accumulate for more than a week, and never until the exam period.

Practicals

- Most practicals relate directly to the lectures preceding them. Take your lecture notes and previous practicals with you to practical classes, plus a calculator, relevant reference books (e.g. a mineralogy book), and drawing materials.
- Try to be clear what the learning/training objectives are for each practical.
- Write up each practical report promptly, even if the practical is not being assessed.
- Carefully file all practical scripts and reports - practicals are an important part of your learning process and scripts therefore provide essential revision material.

Tutorials

- Keep notes of material discussed in tutorials.
- Use your diary, because tutorials may take place at irregular intervals.
- Write down titles of assignments, the length required (if a report) and the deadline for handing in.
- Use tutorials to iron out problems. Spend some time before a tutorial reviewing different areas of lecture notes, etc., to discuss at the tutorial.

Private Study

- Keep all your lecture notes in an orderly state - e.g. in a file with dividers - so that material can be traced easily.
- Keep notes of the background reading that you do - making the notes helps you to assimilate the material (no highlighter pen does that).
- Where possible, review the previous week’s lecture(s) the evening before the next lecture in the series. Take up any difficult points with the lecturer when you see him/her.
- When mentally assimilating a large volume of factual material, try to view it from different angles by making lists or alternative notes.

Exam technique

Preparation

Organise your time as the exams approach:
- map out the preparation time available.
- list all the tasks to be done and prioritise them.
- timetable tasks as if you had only half the time available. Use the remainder for overspill, or going over material a second time.
- beware the perils of ‘displacement activity’ - filling time with trivial activities as a means of putting off an unpleasant job, like revising!
- Arrange to discuss past exam papers (available on Moodle), and your attempts at writing outline answers to questions, with your personal advisor and/or the relevant course co-ordinators.

Exam writing

Read the paper instructions very carefully:
- number of questions to be answered? time allowed?
- are any questions compulsory, or is there a prescribed number per section?
- do different sections require separate answer books? Read each question very carefully. For those you decide to tackle:
- start each question on a new page of the answer book. Take note of any instructions to answer different sections of the paper in different answer books.

• don't waste time copying out the question into the answer
• map out your answer in the answer book as a list of topics/headings (don't just start writing).
• check the question to make sure you are really answering the points required. However erudite your answer, we cannot give you marks if it is on the wrong topic.
• write the full answer, if possible with 5 minutes to spare. Spend most time on the parts of the question that earn most marks.
• check the answer to ensure it fully covers what is required (as much as you can).

A well-annotated figure may be as informative as a page of writing. Don’t inflate your answer with repetition or irrelevant material. Hard information and evidence of understanding earn marks, not length.

At the end of the exam, ensure your Candidate Number is correctly entered on each answer book, and tie answer books.

Study support
For assistance check out the 'study resources and academic support' page is now available on the College website:
http://www.rhul.ac.uk/forstudents/studyresources/home.aspx

Personal Development Planning (PDP)
In a climate where job opportunities and career patterns are becoming increasingly unpredictable, and skills and the ability to articulate one’s skills increasingly important, planning for the future is crucial. Personal Development Planning is a structured and supported process that enables you to reflect on your own learning, performance and achievement and to plan for your personal, educational and career development. It involves devising a scheme that will enable you to determine where you are now, where you aim to go, and which actions you might need to take to get there.

PDP offers formal mechanisms for reflection and self-assessment and methods for recording them, as well as opportunities for meaningful discussion of learning, achievement and employment. For more details consult the College PDP web site (http://www.rhul.ac.uk/pdp). Section G of this handbook lists some of the skills you should acquire during your time in the department.

Entrepreneurs and Business
The Research and Enterprise Office of Royal Holloway supports a wide range of extra curricular activities for students both on and off the campus. These include:
- Pursuing business ideas
- Entrepreneurship events
- Business ideas and enterprise competitions

In 2009 students from the College had an exceptional year, winning over £11000 in a number of local and regional competitions. If you are interested to learn more you can contact the Research and Enterprise Office via their web site.

Student Community Action – get volunteering!
The Royal Holloway Community Action Volunteering Programme exists to connect, train and support students seeking to volunteer in the local community. There is a whole range of project opportunities from sports coaching, youth work, supporting clubs for young people with special needs, tutoring & mentoring school pupils, teaching English or IT to young refugees & asylum seekers, reminiscence work, befriending elders, charity shop support, carrying out conservation & preservation work and so much more. We also have office placements and internships with local charities available. Volunteering enhances your transferable skills and employability giving CV value, builds a healthy long-term community spirit, and is loads of fun whilst meeting new people.

The Community Action Volunteer Co-ordinator and the Student Union Volunteering Officer can support your volunteering work with training through the student development programme, community action student team and volunteering awards & accreditation scheme. During the year you are invited to volunteer through our one off project events such as Make A Difference Day, the BIG spring clean and Volunteering Week take place with the slogan ‘serving the community, students in action’ where volunteers get involved in a range of local community projects. So choose to get involved today!

To find out more and get involved with Community Action come to the Freshers’ Fair, drop by the office in the Students’ Union, call 01784 414078, e-mail volunteering@rhul.ac.uk, join the facebook group or go online at www.rhul.ac.uk/services/volunteering

Equal opportunities
The College does not discriminate against any person on the grounds of race, ethnic origin, gender, age, marital
status, details of dependants, nationality, disabilities, sexual orientation, religion, political beliefs or social origin. More details on these policies can be found in the College Student Handbook.

**Students’ Union**

The Students’ Union offers a wide range of services and support, from entertainment and clubs/societies to advice on welfare and academic issues. The Advice and Support Centre, situated on the first floor of the Students’ Union, runs a confidential service that is independent from the College. Open 9.30am - 5pm, Monday – Friday, it operates an open door policy exclusively for students during term time. However, during vacation periods students should call to book an appointment. Full details can be found at [www.su.rhul.ac.uk/support](http://www.su.rhul.ac.uk/support)
### Section C

#### MARKING CRITERIA FOR ASSESSED UNDERGRADUATE WORK

<table>
<thead>
<tr>
<th>Mark</th>
<th>Candidates scored</th>
<th>Description of mark</th>
<th>Achievement of the marking criteria</th>
<th>Typical evidence of performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>Some evidence of understanding of subject area</td>
<td>30-39</td>
<td>Not sufficient to carry out the piece of work</td>
<td>None of the above.</td>
</tr>
<tr>
<td>Lower second class</td>
<td>Some understanding of the subject area</td>
<td>40-49</td>
<td>Partially satisfactory</td>
<td>Competent understanding of the whole topic; may show clear and complete information.</td>
</tr>
<tr>
<td>First class</td>
<td>Adequate understanding of the subject area</td>
<td>50-59</td>
<td>Satisfactory</td>
<td>Adequate understanding in terms of depth and clarity.</td>
</tr>
<tr>
<td>First class</td>
<td>Excellent understanding of the subject area</td>
<td>60-69</td>
<td>Outstanding</td>
<td>Excellent understanding in terms of depth and clarity.</td>
</tr>
<tr>
<td>First class</td>
<td>Outstanding understanding of the subject area</td>
<td>70-79</td>
<td>Outstanding</td>
<td>Outstanding understanding in terms of depth and clarity.</td>
</tr>
</tbody>
</table>

**Note:**
- Fail: No significant attempt has been made to carry out the piece of work or present a report on it.
- Lower second class: A basic understanding of the whole topic; may show very limited information in depth and clarity.
- First class: A good understanding of the whole topic; may show high levels of information in depth and clarity.
- First class: A very good understanding of the whole topic; may show full understanding of depth and clarity.
- Outstanding: A full understanding of the whole topic; may show very high levels of information in depth and clarity.
SECTION D: Degree programmes and associated course units

Note: Courses enclosed in bold boxes are 'core' (must be taken) or 'compulsory' (italics, must be passed) for completion of the relevant programme. All single honours programmes can also be combined with a year in industry to form a 'year in industry' degree. Dashed boxes refer to courses in other departments.

### MSci Geoscience 2013/2014

**F601/602**

**FIRST YEAR**
- GL1100: Global Tectonics
- GL1200: Introductory Sedimentology
- GL1460: Igneous and metamorphic geology
- GL1500: Physics and Chemistry of the Earth
- GL1600: Earth structures
- GL1700: Mathematics for Geologists
- GL1800: Introductory Palaeontology
- GL1300: Environmental Issues
- GL1750: Introduction to Petroleum Geology

**SECOND YEAR**
- GL2210: Regional Geology
- GL2400: Igneous and Metamorphic Geology
- GL2901: Field Methods in Geology
- GL2500: Applied Geophysics
- GL2600: Structural Analysis and Remote Sensing

**THIRD YEAR**
- GL3001: Advanced Concepts and Techniques in Geology
- GL3210: Advanced Topics in Sedimentology
- GL3250: Sedimentary Basin Analysis
- GL3460: Volcanology
- GL3600: Advanced techniques in Tectonic and Structural Interpretation
- GL3750: Mineral Resources
- GL3800: Advanced Palaeontology
- GL3951: Mapping sedimentary basins

**FOURTH YEAR**
- GL4012: Independent Geoscience Project
- GL4250: Earth surface processes
- GL4500: Seismic processing
- GL4510: Geodynamics
- GL4620: Structural analysis
- GL4700: Petroleum geology
- GL4720: Reservoir characterisation

### Options (2 course units):
- GL4100: Research proposal
- GL4250: Earth surface processes
- GL4400/GL4411: Advanced Igneous Petrogenesis
- GL4500: Seismic Processing & Interpretation
- GL4510: Geodynamics and Plate Tectonics
- GL4620: Interpretation of Structural Settings
- GL4720: Reservoir Characterisation
- GL4810 Terrestrial Palaeoecology
- and/or choices from MSci Environmental Geoscience options

**International Year students:**
- GL3920 and GL4920: Independent Geological Field Mapping (3rd and 4th year)

### MSci Petroleum Geology 2013/2014

**F622**

**FIRST YEAR**
- GL1100: Global Tectonics
- GL1200: Introductory Sedimentology
- GL1460: Igneous and metamorphic geology
- GL1500: Physics and Chemistry of the Earth
- GL1600: Earth structures
- GL1700: Mathematics for Geologists
- GL1750: Introduction to Petroleum Geology
- GL1800: Introductory Palaeontology

**SECOND YEAR**
- GL2210: Regional Geology
- GL2400: Igneous and Metamorphic Geology
- GL2901: Field Methods in Geology
- GL2500: Applied Geophysics
- GL2600: Structural Analysis and Remote Sensing

**THIRD YEAR**
- GL3001: Advanced Concepts and Techniques in Geology
- GL3210: Advanced Topics in Sedimentology
- GL3250: Sedimentary Basin Analysis
- GL3460: Volcanology
- GL3600: Advanced techniques in Tectonic and Structural Interpretation
- GL3750: Mineral Resources
- GL3800: Advanced Palaeontology
- GL3951: Mapping sedimentary basins

**FOURTH YEAR**
- GL4511: Petroleum Geology Project
- GL4250: Earth surface processes
- GL4500: Seismic processing
- GL4510: Geodynamics
- GL4620: Structural analysis
- GL4700: Petroleum geology
- GL4720: Reservoir characterisation

### Options (2 course units): (if taken)
- GL3141: Applied Geology (Industrial Placement) 9-12 month work experience
- GL3141: Applied Geology (Industrial Placement) 9-12 month work experience

**International Year students:**
- GL3920 and GL4920: Independent Geological Field Mapping (3rd and 4th year)
### F631: MSci Environmental Geoscience 2013/2014

<table>
<thead>
<tr>
<th><strong>FIRST YEAR</strong></th>
<th><strong>SECOND YEAR</strong></th>
<th><strong>THIRD YEAR</strong></th>
<th><strong>FOURTH YEAR</strong></th>
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</thead>
<tbody>
<tr>
<td>GL1200: Introductory Sedimentology</td>
<td>GL2210: Regional Geology</td>
<td>GL3340: GIS and Remote Sensing</td>
<td><strong>Options (four):</strong></td>
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<tr>
<td>GL1300: Environmental Issues</td>
<td>GL2320: Geohazards</td>
<td>GL3350: Environmental Geoscience Report</td>
<td>at least two of:</td>
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<tr>
<td>GL1460: Igneous and metamorphic geology</td>
<td>GL2410: Geochemistry</td>
<td>GL3490: Methods of Environmental Investigation</td>
<td>GL4100: Research proposal</td>
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<tr>
<td>GL1500: Physics and Chemistry of the Earth</td>
<td>GL2901: Field Methods in Geology</td>
<td>Options (three):</td>
<td>GL4300: Water quality</td>
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<tr>
<td>GL1600: Earth structures</td>
<td>Plus: Two other Geoscience courses</td>
<td>GL3210: Advanced Topics in Sedimentology</td>
<td>GL4310: Air pollution</td>
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<tr>
<td>GL1800: Introductory Palaeontology</td>
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<td>GL3460: Volcanology</td>
<td>GL4340: Oceans and atmospheres</td>
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<tr>
<td>and either</td>
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<td>GL3600: Advanced techniques in Tectonic and Structural Interpretation</td>
<td>GL4370: Contaminated Land</td>
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<tr>
<td>GL1300: Environmental Issues</td>
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<td>GL3750: Mineral Resources</td>
<td>GL4380: Environmental Inorganic Analysis</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td>or choices from MSci Geoscience 3rd year options</td>
<td>GL4820: Palaeoclimates</td>
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<tr>
<td>GL1750: Introduction to Petroleum Geology</td>
<td></td>
<td></td>
<td>and/or choices from MSci Geoscience options</td>
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**International Year students:** Year 3 abroad

### F600: BSc Geology 2013/2014

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<th><strong>FIRST YEAR</strong></th>
<th><strong>SECOND YEAR</strong></th>
<th><strong>FINAL YEAR</strong></th>
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</thead>
<tbody>
<tr>
<td>GL1200: Introductory Sedimentology</td>
<td>GL2210: Regional Geology</td>
<td><strong>Options:</strong></td>
</tr>
<tr>
<td>GL1460: Igneous and metamorphic geology</td>
<td>GL2400: Igneous and Metamorphic Geology</td>
<td>at least two of:</td>
</tr>
<tr>
<td>GL1500: Physics and Chemistry of the Earth</td>
<td>GL2410: Geochemistry</td>
<td>GL3210: Advanced Topics in Sedimentology</td>
</tr>
<tr>
<td>GL1800: Introductory Palaeontology</td>
<td>GL2901: Field Methods in Geology</td>
<td>GL3600: Advanced techniques in Tectonic and Structural Interpretation</td>
</tr>
<tr>
<td>and either</td>
<td>GL3141: Applied Geology (Industrial Placement)</td>
<td>GL3750: Mineral Resources</td>
</tr>
<tr>
<td>GL1300: Environmental Issues</td>
<td>9-12 month work experience placement available in addition to final year courses</td>
<td>GL3800: Advanced Palaeontology</td>
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<tr>
<td>or</td>
<td></td>
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<tr>
<td>GL1750: Introduction to Petroleum Geology</td>
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<td>GL3300: Aqueous Geology</td>
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Option: between 2nd and final years

GL3141: Applied Geology (Industrial Placement)

9-12 month work experience placement available in addition to final year courses

International Year students: Year 3 abroad
<table>
<thead>
<tr>
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<th>Year</th>
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<tbody>
<tr>
<td>GL1100</td>
<td>Global Tectonics</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1200</td>
<td>Introductory Sedimentology</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1400</td>
<td>Igneous and metamorphic geology</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1500</td>
<td>Physics and Chemistry of the Earth</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1600</td>
<td>Earth structures</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1700</td>
<td>Mathematics for Geologists</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1800</td>
<td>Introductory Palaeontology</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1300</td>
<td>Environmental Issues</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1450</td>
<td>Sedimentary Petrology</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1850</td>
<td>Introduction to Petroleum Geology</td>
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**SECOND YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>GL2200</td>
<td>Stratigraphy and the history of life</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2210</td>
<td>Regional Geology</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2320</td>
<td>Geohazards</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2410</td>
<td>Geochemistry</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2500</td>
<td>Applied Geophysics</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2600</td>
<td>Structural Analysis and Remote Sensing</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2901</td>
<td>Field Methods in Geology</td>
<td>SECOND YEAR</td>
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**THIRD YEAR**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>GL3001</td>
<td>Advanced Concepts and Techniques in Geology</td>
<td>THIRD YEAR</td>
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<tr>
<td>GL3300</td>
<td>Aqueous Geology</td>
<td>THIRD YEAR</td>
</tr>
<tr>
<td>GL3321</td>
<td>Environmental Geology Project</td>
<td>THIRD YEAR</td>
</tr>
<tr>
<td>GL3940</td>
<td>Methods of Environmental Investigation</td>
<td>THIRD YEAR</td>
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</tbody>
</table>

**Options:**
- GL3210: Advanced Topics in Sedimentology
- GL3340: GIS and Remote Sensing
- GL3460: Volcanology
- GL3750: Mineral Resources

**Plus:** Two other Geoscience courses

**Option: between 2nd and final years**

- GL3141: Applied Geology (Industrial Placement)
- 9-12 month work experience placement available in addition to final year courses

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<tbody>
<tr>
<td>GL1100</td>
<td>Global Tectonics</td>
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<tr>
<td>GL1200</td>
<td>Introductory Sedimentology</td>
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<td>GL2400</td>
<td>Igneous and Metamorphic Geology</td>
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<td>GL2410</td>
<td>Geochemistry</td>
<td>FIRST YEAR</td>
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<tr>
<td>GL2500</td>
<td>Applied Geophysics</td>
<td>FIRST YEAR</td>
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<tr>
<td>GL2500</td>
<td>Applied Geophysics</td>
<td>SECOND YEAR</td>
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<tr>
<td>GL2600</td>
<td>Structural Analysis and Remote Sensing</td>
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<tr>
<td>GL2901</td>
<td>Field Methods in Geology</td>
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**Option: between 2nd and final years**

- GL3141: Applied Geology (Industrial Placement)
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<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1500</td>
<td>Physics and Chemistry of the Earth</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1600</td>
<td>Earth structures</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1700</td>
<td>Mathematics for Geologists</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>GL1800</td>
<td>Introductory Palaeontology</td>
<td>FIRST YEAR</td>
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<td>SECOND YEAR</td>
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<td>GL2320</td>
<td>Geohazards</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2410</td>
<td>Geochemistry</td>
<td>SECOND YEAR</td>
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<td>GL2500</td>
<td>Applied Geophysics</td>
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<tr>
<td>GL2600</td>
<td>Structural Analysis and Remote Sensing</td>
<td>SECOND YEAR</td>
</tr>
<tr>
<td>GL2901</td>
<td>Field Methods in Geology</td>
<td>SECOND YEAR</td>
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<td>THIRD YEAR</td>
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<tr>
<td>GL3321</td>
<td>Environmental Geology Project</td>
<td>THIRD YEAR</td>
</tr>
<tr>
<td>GL3940</td>
<td>Methods of Environmental Investigation</td>
<td>THIRD YEAR</td>
</tr>
</tbody>
</table>

**Options:**
- GL3210: Advanced Topics in Sedimentology
- GL3340: GIS and Remote Sensing
- GL3460: Volcanology
- GL3750: Mineral Resources

**Plus:** Two other Geoscience courses

**Option: between 2nd and final years**

- GL3141: Applied Geology (Industrial Placement)
- 9-12 month work experience placement available in addition to final year courses

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# BSc Physical Geography and Geology

## 2013/2014

### FIRST YEAR
- GL1100: Global Tectonics
- GL1200: Introductory Sedimentology
- GL1300: Environmental Issues
- GL1650: Earth Materials
- GG1001: Physical Geography I
- GG1002: Physical Geography II
- GG1012: Geographical Techniques
- GG1033: Geographical Research and Field Training

### SECOND YEAR
- GL2200: Stratigraphy and the history of life
- GL2210: Regional Geology
- GL2320: Geohazards
- GL2930: Geological and Geographical Field Methods

### THIRD YEAR
- GG3002/GL3131: Independent project

### Options: normally two to four from
- GL3210: Advanced Topics in Sedimentology
- GL3300: Aqueous Geology
- GL3340: GIS and Remote Sensing
- GL3460: Volcanology
- GL3510: Planetary Geology & Geophysics

### Options: normally two to four from Geography
- GG2013: Environmental systems (1 cu)
- GG2021: Geomorphology (1 cu)
- GG2041: Environmental Change
- GG2043: Biogeography (1 cu)
### First Year Course Units offered by the Earth Sciences Department

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Coordinator</th>
<th>Unit Value</th>
<th>Assessment %</th>
<th>Co-ordinator</th>
<th>Assessment %</th>
<th>Co-ordinator</th>
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<tbody>
<tr>
<td>GL 1100</td>
<td>Global Tectonics</td>
<td>P Vannucchi</td>
<td>0.5</td>
<td>exam 70</td>
<td></td>
<td>reports 20</td>
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<tr>
<td></td>
<td>Structure and composition of the Earth - the core, mantle and crust - physical, chemical and thermal structure, origin and age. Plate tectonics - ocean floor spreading and subduction, continental collision, rifting and break-up, uplift and exhumation.</td>
<td></td>
<td></td>
<td>fieldwork 10</td>
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<tr>
<td>GL 1200</td>
<td>Introductory Sedimentology</td>
<td>D Le Heron</td>
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<td>exam 70</td>
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<td>reports 30</td>
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<tr>
<td></td>
<td>Surface processes and the mechanisms of weathering, transport and deposition Classification of sediments and sedimentary rocks. Depositional facies analysis and interpretation of paleoenvironment. Sedimentary rock environments: Continental (glacial, aeolian, fluvial, lacustrine), marine (deltas, coastlines, estuaries, shelves and deep water). Post depositional effects (diagenesis). Resources in sedimentary strata. Sedimentary logs, triangular diagrams, vector scales (rose diagrams) and granulometric data.</td>
<td></td>
<td></td>
<td>fieldwork 10</td>
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<tr>
<td>GL 1300</td>
<td>Environmental Issues</td>
<td>D Alderton</td>
<td>0.5</td>
<td>exam 50</td>
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<td>reports 20</td>
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<tr>
<td></td>
<td>1) Environmental Geology: Resources - energy, rocks and minerals; extraction and their effects on the environment. Water - as a resource, pollution. Geological hazards - causes and mitigation - volcanoes, landslides, earthquakes, tsunamis Waste disposal 2) Scientific essay writing - references, plagiarism, abstract, structure. Oral presentations</td>
<td></td>
<td></td>
<td>fieldwork 30</td>
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<tr>
<td>GL 1460</td>
<td>Igneous and metamorphic geology</td>
<td>C Manning</td>
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<td>reports 40</td>
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<tr>
<td>GL 1500</td>
<td>Physics and Chemistry of the Earth</td>
<td>D Mattey</td>
<td>0.5</td>
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<td>reports 20</td>
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<tr>
<td></td>
<td>Outline of principles and techniques, and their application in a geological context. Chemistry of the Earth - atoms and atomic structure, the Periodic table, reactions, equations, introduction to geochemical analysis, composition of the Earth, interpretation of phase diagrams, solubility of minerals, weathering and the hydrological cycle. Geophysics to investigate the Earth: Newton's Laws, kinematics, circular motion, planetary orbits, gravity, magnetism, electricity, resistivity, stress, strain, seismicity, isostasy, radioactivity, geochronology.</td>
<td></td>
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<td>fieldwork 20</td>
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<tr>
<td>GL 1600</td>
<td>Earth Structures</td>
<td>R Hall</td>
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<td>exam 60</td>
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<td>reports 20</td>
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<tr>
<td></td>
<td>The principles of structural geology and the interpretation of geological maps. Module 1: Earth Structures 1 - outcrop patterns, folds, bedding, cleavage and faults. Module 2: Earth Structures 2 - deformation fabrics, stereo nets, shear zones, joints and veins.</td>
<td></td>
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<td>fieldwork 20</td>
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<td>GL 1650</td>
<td>Earth Materials</td>
<td>C Manning</td>
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### First Year Course Units offered by the Earth Sciences Department

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Coordinator</th>
<th>Prerequisites</th>
<th>Unit Value</th>
<th>Assessment (%)</th>
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<tbody>
<tr>
<td>GL1700</td>
<td>Mathematics for Geologists</td>
<td>R Fisher</td>
<td>None</td>
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<td>70 exam, 30 reports, 30 fieldwork</td>
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<tr>
<td>GL1750</td>
<td>Introduction to Petroleum Geology</td>
<td>P Burgess</td>
<td>None</td>
<td>0.5</td>
<td>50 exam, 20 reports, 30 fieldwork</td>
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<tr>
<td></td>
<td>Introduction to the oil industry: past, present and future. Nature of petroleum and the major oilfields of the world. Exploration and production methods. Environmental concerns and the future for oil. Research and communication skills: The nature of Scientific literature; how to source information, writing reports, portraying visual information, preparing and delivering an oral presentation.</td>
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<td>GL1800</td>
<td>Introductory Palaeontology</td>
<td>M Collinson</td>
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<td>60 exam, 25 reports, 15 fieldwork</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
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<td>GL2200</td>
<td>Stratigraphy and the History of Life</td>
<td>M Thirlwall</td>
<td>GL1200</td>
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<td>M Thirlwall</td>
<td></td>
<td>0.5</td>
<td>exam 60, reports 40, fieldwork 20</td>
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<tr>
<td>GL2320</td>
<td>Geohazards</td>
<td>E Nisbet</td>
<td>normally GL1300</td>
<td>0.5</td>
<td>exam 60, reports 20, fieldwork 20</td>
</tr>
<tr>
<td>GL2400</td>
<td>Igneous and Metamorphic Geology</td>
<td>D Mattey</td>
<td>GL1460</td>
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<td>exam 60, reports 40, fieldwork 20</td>
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<td>Geochemistry</td>
<td>W Müller</td>
<td>GL1500</td>
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<td>exam 50, reports 20, fieldwork 30</td>
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<td>M Perez-Gussinye</td>
<td>GL1500</td>
<td>0.5</td>
<td>exam 50, reports 50</td>
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<tr>
<td>GL2600</td>
<td>Structural Analysis and Remote Sensing</td>
<td>I Watkinson</td>
<td>GL1600</td>
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<td>exam 60, reports 20, fieldwork 20</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Coordinator</td>
<td>Unit Value</td>
<td>Assessment %</td>
<td>Prerequisites</td>
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<tr>
<td>GL2901</td>
<td>Field Methods in Geology</td>
<td>M Thirlwall</td>
<td>1.0</td>
<td>100</td>
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<td></td>
<td>Prerequisites: A course of fieldwork, spread over 1st and 2nd years, in which techniques of examining rocks of various types, recording data and making a geological map, are taught. This will include keeping a field notebook, measuring and logging stratigraphic sections and collecting and using structural geological data. Field class exercises and reports constitute the assessment of this course. Students will learn which methods are appropriate in different circumstances and will be taught how to integrate their field observations to make interpretations of the geological history of the areas studied.</td>
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<tr>
<td>GL2930</td>
<td>Geological and Geographical Field Methods</td>
<td>M Thirlwall</td>
<td>0.5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prerequisites: A course of geological and/or geographical fieldwork spread over 1st and 2nd years comprising techniques of examining rocks, sediments, landforms and processes of various types, keeping a field notebook, measuring and logging sediments and sedimentary rocks, collecting and using structural geological data and geological and geomorphological mapping. Specifically designed for Joint Geology/Geography students.</td>
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</tbody>
</table>
### GL3001 - Advanced Concepts and Techniques in Geology

**Coordinator:** E Nisbet  
**Prerequisites:** None  
**Unit Value:** 1.0  
**Assessment:**  
- **exam:** 65  
- **fieldwork:** 15  
- **practicals:** 20  
**Course Description:** A course including cutting-edge topics and providing key geological and transferable skills for advanced-level students. Module 1: Frontiers in Geology lectures - Philosophy of Geology, Physical Origins, the plate system. Biological controls Environment. Module 2: Integrated practicals - analysis of a range of diverse geological materials. Module 3: Data Handling - retrieval and handling of geological data which revises and extends numerical skills introduced in years 1 and 2. Module 4: Presentation skills - aspects of spoken, visual and more advanced aspects of written communication in geology. Module 5: Advanced Field Course - includes data collection, teamwork and site investigations.

### GL3120 - Independent Project

**Coordinator:** D H M Alderton  
**Prerequisites:** None  
**Unit Value:** 0.5  
**Assessment:**  
- **exam:** 90  
- **reports:** 10  
- **practicals:** 10  
- **fieldwork:**  
**Course Description:** A report in the form of a scientific paper (5,000 words) of independent, research work on a field and/or laboratory project based on any aspect of geology. Topics must be formulated with an academic member of staff as supervisor of the project before the end of the Summer term of the preceding year. The official form must outline the project, be signed by the supervisor and be given to the course coordinator before registration at the start of the final year (if not, then registration will not be possible). Students are expected to give a verbal account (which is assessed) of their project during the second term. The project is examined orally by the External Examiners.

### GL3131 - Independent Project

**Coordinator:** D H M Alderton  
**Prerequisites:** None  
**Unit Value:** 1.0  
**Assessment:**  
- **exam:** 90  
- **reports:** 10  
- **practicals:** 10  
- **fieldwork:**  
**Course Description:** A report in the form of a scientific paper (8,000 words) of independent, research work on a field and/or laboratory project based on any aspect of geology. Topics must be formulated with an academic member of staff as supervisor of the project before the end of the Summer term of the preceding year. The official form must outline the project, be signed by the supervisor and be given to the course coordinator before registration at the start of the final year (if not, then registration will not be possible). Students are expected to give a verbal account (which is assessed) of their project during the second term. The project is examined orally by the External Examiners.

### GL3141 - Applied Geology (Industrial Placement)

**Coordinator:** D H M Alderton  
**Prerequisites:** None  
**Unit Value:** 1.0  
**Assessment:**  
- **exam:** 100  
- **reports:**  
- **practicals:**  
- **fieldwork:**  
**Course Description:** Selected Geology students may interrupt their formal studies between second and final years to work for 9-12 months in an industrial or public-service laboratory on an approved, coherent programme of work in the general field of geology. Each student will be selected jointly by the Department and the host laboratory, would have a named project adviser in the host laboratory and/or laboratory project based on any aspect of geology. Topics must be formulated with an academic member of staff as supervisor of the project before the end of the Summer term of the preceding year. The official form must outline the project, be signed by the supervisor and be given to the course coordinator before registration at the start of the final year (if not, then registration will not be possible). Students are expected to give a verbal account (which is assessed) of their project during the second term. The project is examined orally by the External Examiners.

### GL3210 - Advanced Topics in Sedimentology

**Coordinator:** D Le Heron  
**Prerequisites:** GL2200  
**Unit Value:** 0.5  
**Assessment:**  
- **exam:** 70  
- **reports:** 30  
- **practicals:**  
- **fieldwork:**  
**Course Description:** To study selected topics in sedimentology, particularly those attracting current research interest. The emphasis in this course is on sedimentary processes, depositional environments, and on the role of climate in sedimentary processes. Current topics include: weathering, soil formation, alluvial and deltaic deposition, glacial sedimentation, "Snowball Earth" events, carbonate platform sedimentation, and the use of trace fossils in sedimentology.

### GL3250 - Sedimentary Basin Analysis

**Coordinator:** M Perez-Gussinye  
**Prerequisites:** None  
**Unit Value:** 0.5  
**Assessment:**  
- **exam:** 70  
- **reports:** 30  
- **practicals:**  
- **fieldwork:**  
**Course Description:** Formation of sedimentary basins and their structural features through characteristic patterns of sedimentary facies and stratigraphic architecture. Interpretation of surface and sub-surface basin-fill sequences. Surface and sub-surface techniques in basin analysis through stratigraphic and facies analysis. Seismic stratigraphy. Basin classification based on tectonic regime and basin fill.

### GL3300 - Aqueous Geology

**Coordinator:** D H M Alderton  
**Prerequisites:** GL1100  
**Unit Value:** 0.5  
**Assessment:**  
- **exam:** 60  
- **reports:** 10  
- **practicals:** 30  
- **fieldwork:**  
**Course Description:** The course will consider the global hydrological cycle: the occurrence of groundwater in the hydrological cycle; groundwater in the modern environment: the effect of groundwater chemistry and weathering: the oceanic system and its effect on global hydrology: and replenishment of water from hydrothermal systems.
## Third Year Course Units offered by the Earth Sciences Department

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Coordinator</th>
<th>Unit Value</th>
<th>Assessment %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL3321</td>
<td>Environmental Geology Project</td>
<td>D H M Alderton</td>
<td>1.0</td>
<td>exam 100, reports 0, practicals 0, fieldwork 0</td>
</tr>
<tr>
<td>GL3340</td>
<td>GIS and Remote Sensing</td>
<td>R Hall</td>
<td>0.5</td>
<td>exam 60, reports 40, practicals 10, fieldwork 0</td>
</tr>
<tr>
<td>GL3350</td>
<td>Environmental Geoscience Report</td>
<td>D H M Alderton</td>
<td>0.5</td>
<td>exam 100, reports 0, practicals 0, fieldwork 0</td>
</tr>
<tr>
<td>GL3460</td>
<td>Volcanology</td>
<td>GL2400</td>
<td>0.5</td>
<td>exam 50, reports 40, practicals 10, fieldwork 0</td>
</tr>
<tr>
<td>GL3510</td>
<td>Planetary Geology and Geophysics</td>
<td>D P Mattey</td>
<td>0.5</td>
<td>exam 50, reports 50, practicals 0, fieldwork 0</td>
</tr>
<tr>
<td>GL3600</td>
<td>Advanced techniques in tectonic and structural interpretation</td>
<td>Gudmundsson</td>
<td>0.5</td>
<td>exam 70, reports 30, practicals 0, fieldwork 0</td>
</tr>
<tr>
<td>GL3700</td>
<td>The Geology of Petroleum</td>
<td>P Burgess</td>
<td>0.5</td>
<td>exam 60, reports 40, practicals 0, fieldwork 0</td>
</tr>
</tbody>
</table>

**GL3321: Environmental Geology Project**
Under tutorial guidance, the independent project involves students in research into some aspect of environmental geology, such as groundwater pollution, waste management, subsidence, etc. Further information, including notes concerning the style of presentation will be available at the time a topic is selected and approved. Students are expected to give a verbal account of their project to their supervisor and tutor during the Lent Term. The project is examined orally by the External Examiners.

**GL3340: GIS and Remote Sensing**
A practical introduction to geographical information systems and remote sensing through computer applications. An introduction to the most commonly used GIS software and the principles of digital cartography and computer databases capable of storing and manipulating geographically referenced information. Use of GIS (MapInfo) through hands-on acquisition of their own and existing datasets. Principles of remote sensing and different image types. How different types of imagery are obtained, interpreted and used in environmental geology. Use of digital image processing application (ERMapper) to see how different types of information can be acquired from remotely sensed images and can be used in environmental geology.

**GL3350: Environmental Geoscience Report**
A largely independent literature review project, presented in the form of a scientific paper, concerned with a topic of environmental geology interest. Topics will be chosen from an approved list, or after discussion with members of academic staff and may be related to 4th year projects.

**GL3460: Volcanology**
A course dealing with the physical dimension of igneous activity. magma viscosity in relation to chemical composition and structure, non-Newtonian behaviour of melts, laminar and turbulent flow and Reynolds number, with applications to the flow of lavas and pyroclastic systems. Styles of volcanic eruption in relation to volatile content, viscosity, effusion rate - the dispersal-fragmentation (D-F) plot. Mechanisms and products of hawaiian, strombolian, plinian eruptions and the formation of calderas. Magma-water interaction. magma chamber convection and the formation of layered intrusions. Tectonic controls on the emplacement of granites.

**GL3510: Planetary Geology and Geophysics**
The course offers an exploration of the Solar system, its physical and chemical characteristics, origin and evolution. Exploration methods involve remote sensing image analysis, geophysics and geochemistry. Processes of impact cratering, volcanism, tectonism and gradation determine planetary morphologies. Planetary interiors and atmospheres build knowledge and understanding of planetary processes. Systematic study of the Earth-Moon system, terrestrial planets and outer giants, planetary satellites, comets and meteorites creates an holistic and critical appraisal of planetary evolution.

**GL3600: Advanced techniques in tectonic and structural interpretation**
This course is designed to develop advanced skills in structural and tectonic analysis. Topics covered include brittle and ductile deformation mechanisms, stress & strain analysis, and fracture processes & analysis.

**GL3700: The Geology of Petroleum**
## Third Year Course Units offered by the Earth Sciences Department

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Coordinator(s)</th>
<th>Unit Value</th>
<th>Assessment %</th>
<th>Reports</th>
<th>Practical</th>
<th>Fieldwork</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL3750</td>
<td>Mineral Resources</td>
<td>D H M Alderton</td>
<td>0.5</td>
<td>exam 65%</td>
<td>reports 20%</td>
<td>practicals 15%</td>
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<td></td>
<td>The course covers: the diverse nature of ores and their classification; ore-forming processes and the controls to ore formation. Hydrothermal fluids - their nature and origin; major metallicore deposit associations in sedimentary, igneous and metamorphic environments; industrial minerals; ore microscopy; methods of mining and processing; the environmental effects of mining and processes of remediation; the economics of the commodity markets - the influences of supply, demand and prices, and future trends.</td>
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<tr>
<td>GL3800</td>
<td>Advanced Palaeontology</td>
<td>M Collinson</td>
<td>0.5</td>
<td>exam 60%</td>
<td>reports 40%</td>
<td>practicals</td>
<td>fieldwork</td>
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<td>A course of advanced lectures which illustrate currently developing concepts or methodologies in Palaeontology. These involve detailed studies of some plant, invertebrate and vertebrate groups, including both macrofossils and microfossils, whose emphasis reflects research strengths in the Department. The lectures cover areas such as environmental proxies, evolution, palaeoenvironmental analysis, fossil preservation and a range of other geological applications. A series of seminars will be presented by students which are discussed by both staff and students.</td>
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<tr>
<td>GL3901</td>
<td>Independent Field Mapping</td>
<td>D Lowry</td>
<td>1.0</td>
<td>exam 100%</td>
<td>reports 100%</td>
<td>practicals</td>
<td>fieldwork</td>
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<td>Mapping areas, typically of 15-25 sq km., are chosen to satisfy safety and academic demands. Field supervision is provided by academic staff during the early part of the field work; the student then works independently to produce a field map and a complete field record. During the first term of the 3rd year the data record, results and interpretation are discussed with the field supervisor. Further study of rocks and other data from the field area is undertaken. Students give an illustrated oral presentation, prepare an illustrated written report and a high quality interpreted geological map. The project aims to use the field data to understand the stratigraphy, structure and geological history of the area studied.</td>
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<tr>
<td>GL 3920</td>
<td>Geological mapping 1</td>
<td>D Lowry</td>
<td>0.5</td>
<td>exam 100%</td>
<td>reports 100%</td>
<td>practicals</td>
<td>fieldwork</td>
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<td>The first part of the geological mapping module for year abroad students (equivalent to GL3901). Assessment will be based on: Field slips, logs, structural measurements, notebooks.</td>
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<tr>
<td>GL3940</td>
<td>Methods of Environmental Investigation</td>
<td>D H M Alderton</td>
<td>0.5</td>
<td>exam 50%</td>
<td>reports 50%</td>
<td>practicals</td>
<td>fieldwork</td>
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<td></td>
<td>Field work, comprising: approximately 10 days, visiting industrial sites and investigating the environmental problems associated with present and past extraction of resources (water, metals, industrial minerals); disposal of industrial and domestic waste; engineering problems associated with slope stability and sea-cliff erosion; monitoring water quality and pollution of water. Sampling environmental media: principles, practice, strategies and errors. ICP-AES and ICP-MS analysis: instrumentation and practical applications. Element behaviour and mobility: composition of soils, partitioning of elements, adsorption processes, acid hydrolysis. Natural and anthropogenic sources of elements in soils and waters.</td>
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<tr>
<td>GL3951</td>
<td>Mapping Sedimentary Basins</td>
<td>D Lowry</td>
<td>1.0</td>
<td>exam 100%</td>
<td>reports 100%</td>
<td>practicals</td>
<td>fieldwork</td>
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<td>As for GL3901, but with special emphasis on petroleum geology and hydrocarbon potential. Assessment of possible source, reservoir and cap rocks. Special emphasis on sedimentary structures and graphic sedimentary logs.</td>
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</table>
### GL4012 Independent Geoscience Project
**Coordinator:** M King  
**Pre/Corequisites:** GL3001  
**Assessment:** reports  
**Unit Value:** 2.0  
**Coordinator:** M King  
**Fieldwork:**  
Under the guidance of a departmental supervisor the student will design and execute an independent research project which will be submitted for examination as a report (ca 12000 words). Data collection will either be field-based or laboratory-based and may involve an industrial placement. Field based projects will normally be based on 7-10 days of field work. Data handling using statistical techniques must be integrated into the project. A vital aspect of the project development will be regular presentation of results in the form of seminars to their peer group and staff a number of times during the final year. The final seminar will be assessed by a panel of staff.

### GL4100 Research Proposal and Critical Review
**Coordinator:** D Mattey  
**Pre/Corequisites:**  
**Assessment:** reports  
**Unit Value:** 0.5  
**Core for Geology**  
Students will first formulate a short research proposal and then provide a critical review of another proposal. In both cases, and under the guidance of a supervisor, the first task will be to write a case for support, the second, to write a critical review. These will include: statement of problem, objectives of new research, and an outline of the methodology to be used, particular strengths and weaknesses with respect to undefined questions and hypotheses, scientific flaws, feasibility of methodology and costs, alternative approaches and methodology.

### GL4250 Earth Surface Processes
**Coordinator:** J Hernandez-Molina  
**Pre/Corequisites:**  
**Assessment:** reports  
**Unit Value:** 0.5  
**Core for Geology**  

### GL4300 Water Quality
**Coordinator:** K Clemitshaw  
**Pre/Corequisites:**  
**Assessment:** reports  
**Unit Value:** 0.5  
**Core for Environmental**  
This module begins with fundamental aquatic science and hydrological and hydrogeological processes that impact surface and groundwater. It continues with the treatment and management of water and wastewater, including study visits to water and wastewater treatment plants. The module includes a practical introduction to chemical and ecological monitoring of water quality.

### GL4310 Air Pollution
**Coordinator:** K Clemitshaw  
**Pre/Corequisites:**  
**Assessment:** reports  
**Unit Value:** 0.5  
**Core for Environmental**  
This module is concerned with the dispersion and conversion of gaseous and particulate air pollutants derived from man-made and natural sources, their impacts on the environment, and policy-related management issues. Air quality strategies and measurement methods are also considered. There are study visits to various monitoring networks in the London region.

### GL4320 Modern Climate Change
**Coordinator:** M King  
**Pre/Corequisites:**  
**Assessment:** reports  
**Unit Value:** 0.5  
**Core for Geoscience and Environmental**  
Mechanisms and feedbacks behind modern climate change, Radiative equilibrium, Cycles, Albedo, Snow/ice and frozen grounds, Sea-level rise – mechanism and effects, Models and predictions, Gaia and more extraordinary ideas (e.g. auto-variance).

### GL4322 Independent Environmental Geoscience Project
**Coordinator:** M King  
**Pre/Corequisites:** GL3001  
**Assessment:** reports  
**Unit Value:** 2.0  
**Core for Environmental**  
An independent project, planned by the student with initial guidance and reasonable supervision by academic staff, based on the collection of data and later analysis of that data. The project provides an opportunity to apply many aspects of environmental geology skills acquired during the earlier years of the degree course.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Coordinator(s)</th>
<th>Pre/Corequisites</th>
<th>Description</th>
<th>Unit Value</th>
<th>Assessment Selection</th>
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<tbody>
<tr>
<td>GL4340</td>
<td>Oceans and Atmospheres</td>
<td>E Nisbet</td>
<td>GL4380</td>
<td>The course analyses quantitatively the chemical and thermal reservoirs in the oceans and atmosphere with special reference to the material and energy fluxes between them that regulate Earth’s climate. Understanding the physical and chemical workings of the oceans, e.g. physical circulation, chemical cycling in the ocean-atmosphere system. This understanding is used in the second half of the course to examine and understand the major features of climate change throughout Earth history, but with particular emphasis on natural climate change over the past 2 Myr and anthropogenic impacts over the past several hundred years and into the future.</td>
<td>0.5</td>
<td>Assessment % exam 50 reports 35 practicals 15 fieldwork</td>
</tr>
<tr>
<td>GL4370</td>
<td>Contaminated Land</td>
<td>S Smith</td>
<td>GL4380</td>
<td>Students work together in teams to diagnose the levels of contamination and make recommendations to manage risks for a former industrial site. The case study comprises a desktop study and conceptual model of pollutant source-pathway-receptor linkages; on-site sampling and analysis of soil, surface waters and vegetation with laboratory analysis for heavy metals and organics; statistical and spatial interpretation of data; quantitative assessment of health-risks; recommendations for remediation and validation.</td>
<td>0.5</td>
<td>Assessment % exam 70 reports 90 practicals 30 fieldwork</td>
</tr>
<tr>
<td>GL4380</td>
<td>Environmental Inorganic Analysis</td>
<td>K Clemitshaw</td>
<td>None</td>
<td>A practical introduction to the quantitative analysis of a wide range of inorganic and radionuclide contaminants from fossil-fuel combustion, agriculture, and the extraction of metals and organics to surficial alteration. The course covers the following topics: Modern day plate tectonics and plate structure, Rigid plate tectonics, Asthenosphere dynamics, Lithosphere-Asthenosphere interactions, Forcings on plate motions, Thermal structure of plates, Temperature structure of the continental lithosphere, Lithospheric thickening/thinning, Plate flexure, Continental rifts, Passive margins, Foreland basins, Forearc basins, Strike-slip basins, Inversion.</td>
<td>0.5</td>
<td>Assessment % exam 55 reports 45 practicals 15 fieldwork</td>
</tr>
<tr>
<td>GL4411</td>
<td>Advanced Igneous Petrogenesis and Project</td>
<td>M Thirlwall</td>
<td>GL3460</td>
<td>Review of current ideas on the origin and chemical evolution of magmas across the full range of composition and igneous environment. The chemical consequences of the major igneous processes from mantle differentiation through to surficial alteration. The course covers the following topics: Modern day plate tectonics and plate structure, Rigid plate tectonics, Asthenosphere dynamics, Lithosphere-Asthenosphere interactions, Forcings on plate motions, Thermal structure of plates, Temperature structure of the continental lithosphere, Lithospheric thickening/thinning, Plate flexure, Continental rifts, Passive margins, Foreland basins, Forearc basins, Strike-slip basins, Inversion.</td>
<td>1.0</td>
<td>Assessment % exam 50 reports 45 practicals 15 fieldwork</td>
</tr>
<tr>
<td>GL4500</td>
<td>Seismic Processing and Interpretation</td>
<td>Adam / Waltham</td>
<td>GL2500</td>
<td>This course covers the theory, techniques and methods of seismic reflection profiling and the processing and interpretation of that data. The course will conclude with a seismic interpretation project.</td>
<td>0.5</td>
<td>Assessment % exam 50 reports 50 practicals 15 fieldwork</td>
</tr>
<tr>
<td>GL4510</td>
<td>Geodynamics and Plate Tectonics</td>
<td>J Morgan</td>
<td>GL1500, GL2600</td>
<td>The course covers the following topics: Modern day plate tectonics and plate structure, Rigid plate tectonics, Asthenosphere dynamics, Lithosphere-Asthenosphere interactions, Forcings on plate motions, Thermal structure of plates, Temperature structure of the continental lithosphere, Lithospheric thickening/thinning, Plate flexure, Continental rifts, Passive margins, Foreland basins, Forearc basins, Strike-slip basins, Inversion.</td>
<td>0.5</td>
<td>Assessment % exam 60 reports 40 practicals 15 fieldwork</td>
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</table>
Fourth Year Course Units offered by the Earth Sciences Department

<table>
<thead>
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<th>Course Title</th>
<th>Unit Value</th>
<th>Assessment %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL4511</td>
<td>Petroleum Geology Project</td>
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<tr>
<td></td>
<td>Coordinator: P Burgess</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Pre/Co-requisites: GL4500, GL4620, GL4700, GL4810, GL4820, GL4920, GL5000</td>
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<tr>
<td></td>
<td>Under the guidance of a departmental supervisor the student will design and execute an independent petroleum-related research project which will be submitted for examination as a report (ca 8000 words). Data collection will either be field-based or laboratory-based and may involve an industrial placement. Field-based projects will normally be based on 7-10 days of field work. Data handling using statistical techniques must be integrated into the project. A vital aspect of the project development will be regular presentation of results in the form of seminars to their peer group and staff a number of times during the final year. The final seminar will be assessed by a panel of staff.</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Unit Value</th>
<th>Assessment %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL4620</td>
<td>Interpretation of Structural Settings</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coordinator: D Le Heron</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre/Co-requisites: GL2600, GL4700, GL4810, GL4920, GL5000</td>
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<tr>
<td></td>
<td>Interpretation of geological structures from a variety of different tectonic settings. Deformational processes that operate in extensional, contractional and strike-slip terranes, and the variation in structural styles that result. Expression of structures on seismic and remotely sensed data and the interpretation of such data sets. The course covers Extensional fault geometry, Rift systems, Inversion, Salt Tectonics, Thrust faults and thrust systems, Strike slip faults, Strike slip basins.</td>
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</table>

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Unit Value</th>
<th>Assessment %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL4700</td>
<td>Petroleum Geology</td>
<td>0.5</td>
<td></td>
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<tr>
<td></td>
<td>Coordinator: P Burgess</td>
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<td>Pre/Co-requisites: GL2600, GL4500, GL4810, GL4920, GL5000</td>
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<td>Evaluation of the occurrence of hydrocarbon reserves and planning production. Formation of source rocks, their transformation into hydrocarbons, and the migration and trapping of hydrocarbons. Conditions in hydrocarbon reservoirs and the risk associated with undrilled reserves and the methods by which their economic value can be assessed. A key component of the course is a parallel project in which the students apply their understanding to the evaluation of a hydrocarbon-prospective region. Maturity modelling. Traps and Seals; fault seals. Pressures and Overpressures. Play analysis. Prospect Risking. Economic Analysis</td>
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<td>GL4720</td>
<td>Reservoir Characterisation</td>
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<td>Coordinator: M E Collinson</td>
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<td>Pre/Co-requisites: GL2600, GL4500, GL4810, GL4920, GL5000</td>
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<td>Advanced level training in the integrated interpretation of well log and seismic data as applied to the characterisation of hydrocarbon reservoirs. The course covers the following topics: Principles of gamma ray, sonic, resistivity, density and neutron logs, Correlations using well log data, &quot;Quick look&quot; evaluation of well logs, Petrophysical calculations from well logs, Borehole imaging techniques, Seismic attribute analysis, Direct Hydrocarbon Indicators, AVO analysis, multi-component seisics, 4D seismic techniques.</td>
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<td>This course charts the evolution of plant groups and vegetation types from the earliest colonisation of the land to the present day. It examines palaeoenvironmental controls on plant distribution and the ways in which plant fossils can be used to document past global change. The course will form the basis for study of the evolution of terrestrial ecosystems, with emphasis on insect/plant and mammal/plant co-evolution.</td>
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<td>Coordinator: M Collinson</td>
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<td>Pre/Co-requisites: GL2600, GL4500, GL4810, GL4920, GL5000</td>
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<td>The second part of the mapping module (equivalent to GL3901). Report, fair copy map, cross-sections, stratigraphic columns.</td>
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### 1ST YEAR TIMETABLE

#### Term 1

##### 9-10
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Sedimentology
- **THUR:** Global tectonics – structure
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 11-12
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Sedimentology
- **THUR:** Global tectonics – structure
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 12-1
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Petroleum Geology
- **THUR:** Global Tectonics – Plates
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 1-2
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Sedimentology
- **THUR:** Global tectonics – structure
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 2-3
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Petroleum Geology
- **THUR:** Global Tectonics – Plates
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 3-4
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Sedimentology
- **THUR:** Global tectonics – structure
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 4-5
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Petroleum Geology
- **THUR:** Global Tectonics – Plates
- **FRI:** Introductory Palaeontology – Palaeocommunities

##### 5-6
- **MON:** Introductory Palaeontology – Palaeobiology
- **TUE:** Environmental Issues
- **WED:** Sedimentology
- **THUR:** Global tectonics – structure
- **FRI:** Introductory Palaeontology – Palaeocommunities

#### Term 2

##### 9-10
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 11-12
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 12-1
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 1-2
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 2-3
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 3-4
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 4-5
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology

##### 5-6
- **MON:** Global tectonics – structure
- **TUE:** Earth Structures 2
- **WED:** Earth Structures 1
- **THUR:** Physics & Chem. of the Earth
- **FRI:** Igneous and metamorphic geology
## 2ND YEAR TIMETABLE

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Remember to join the New Lyell Society for regular social events and Guest Lecturers! Search "New Lyell Society" on Facebook.
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<td>24-28 Feb</td>
<td>GL4820 Palaeoclimates</td>
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<tr>
<td>3-7 Mar</td>
<td>GL4310 Air Pollution</td>
<td>GL4310 Air Pollution</td>
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<td>GL4810 Terrestrial Palaeo</td>
</tr>
<tr>
<td>VACATION</td>
<td>Exams GL4700, 4710 in 228</td>
<td>Exams GL4700, 4710 in 228</td>
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<td>Exams GL4700, 4710 in 228</td>
<td>Exams GL4700, 4710 in 228</td>
</tr>
</tbody>
</table>

**TERM 1**

**FIELD COURSES**

**DATES**
- 23-27 Sept: Induction week
- 30 Sept-4 Oct: Induction week
- 7-11 Oct: Induction week
### SECTION G: SKILLS PROGRESSION

You may also find it useful to look at the criteria listed on the GEES website (www.gees.ac.uk/projtheme/emp/empprofos.htm)

#### Transferrable skills

<table>
<thead>
<tr>
<th>First Year</th>
<th>Second Year</th>
<th>Third Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numeracy</strong></td>
<td>GL1200 numerical, graph exercises</td>
<td>GL1460 numerical, graph exercises</td>
<td>GL2400 modal compositional data</td>
</tr>
<tr>
<td><strong>Computer</strong></td>
<td>GL1500/1700 equations, calculus, statistics, graphics</td>
<td>GL2500 geophysical data handling</td>
<td>GL2600 structural data analysis</td>
</tr>
<tr>
<td><strong>Library, information retrieval</strong></td>
<td>GL1001/1300 literature reviews (secondary sources)</td>
<td>GL2200 literature review (primary sources)</td>
<td>GL3001 advanced information retrieval</td>
</tr>
<tr>
<td><strong>Communication, report writing, &amp; presentation</strong></td>
<td>GL1750/1300 literature reviews (2 @ 1000 words)</td>
<td>GL1800 field report</td>
<td>GL2600 field report</td>
</tr>
<tr>
<td><strong>Critical appraisal</strong></td>
<td>Tutorials topic discussion</td>
<td>GL3001 seminar topic</td>
<td>GL3750 specialist topic presentation</td>
</tr>
<tr>
<td><strong>Teamwork</strong></td>
<td>GL2200 group field project</td>
<td>GL2500 Geophysical data acquisition</td>
<td>GL3250 Geophysical data analysis project</td>
</tr>
</tbody>
</table>

#### Laboratory skills

<table>
<thead>
<tr>
<th>First Year</th>
<th>Second Year</th>
<th>Third Year</th>
<th>Fourth Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand specimens</strong></td>
<td>GL1200 sedimentary</td>
<td>GL1460 minerals, igneous, metamorphic</td>
<td>GL2200 sedimentary</td>
</tr>
<tr>
<td><strong>Fossils</strong></td>
<td>GL1800 sedimentary, fossils</td>
<td>GL1800 sedimentary, fossils</td>
<td>GL1800 sedimentary, fossils</td>
</tr>
<tr>
<td><strong>Microscopy, thin sections</strong></td>
<td>GL1200 sedimentary</td>
<td>GL1460/1550 minerals, igneous, metamorphic</td>
<td>GL2200 sedimentary</td>
</tr>
<tr>
<td><strong>Fossils</strong></td>
<td>GL1800 formal description, reconstruction</td>
<td>GL1800 palaeontology, life through time</td>
<td>GL2200 palaeographic</td>
</tr>
<tr>
<td><strong>Mapwork, structural remote sensing</strong></td>
<td>GL1600/1650 'problem' maps, cross sections</td>
<td>GL1281/1313/1600 survey maps, cross sections</td>
<td>GL2200 palaeogeography</td>
</tr>
<tr>
<td><strong>Field skills</strong></td>
<td>GL1100 (Torquay) bedding dip, strike</td>
<td>GL1481/1141 (Charnwood) fold structures</td>
<td>GL2901 (Pembis) fold and fault structures</td>
</tr>
<tr>
<td><strong>Sedimentary logging</strong></td>
<td>GL1100 (Torquay) bedding dip, strike</td>
<td>GL1481/1141 (Charnwood) fold structures</td>
<td>GL2950 (Pembis) fold and fault structures</td>
</tr>
<tr>
<td><strong>Mapping</strong></td>
<td>GL1100 (Torquay) introduction to principles</td>
<td>GL2950 (Pembis) fold and fault structures</td>
<td>GL2950 (Pembis) fold and fault structures</td>
</tr>
<tr>
<td><strong>Sampling / data collection</strong></td>
<td>GL1800 (Cotswold) fossils</td>
<td>GL2500 gravity, magnetics, resistivity, geophysics</td>
<td>GL2901/2930 (Pembis) seismic survey, interpretation</td>
</tr>
</tbody>
</table>

#### KEY:
- GL: core courses for all single honours
- GL/...: core courses for joint/combined honours
- (GL...): optional courses
- (primary sources): data for specialist research topic
- (secondary sources): data for specialist research topic
- [GL...]: independent project
**Fieldwork completed at end of second year in summer vacation. Subsequent report drafting, follow up analysis, data interpretation throughout third year.**

<table>
<thead>
<tr>
<th>Year 4</th>
<th>Year 3</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Iceland</td>
<td>GL3940</td>
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<tr>
<td>Almeria</td>
<td>GL2901</td>
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<tr>
<td>Tenerife</td>
<td>GL3901</td>
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<tr>
<td>Florida</td>
<td>GL4100</td>
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<tr>
<td>Iceland</td>
<td>GL4XXX</td>
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<tr>
<td>SW England</td>
<td>GL3010</td>
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</tr>
</tbody>
</table>

- Igneous rocks
- Metamorphic rocks
- Sedimentary rocks
- Folds and faults
- Textures and foliations
- Basin analysis
- Structural deformation
- Stratigraphic analyses
- Chemical analyses
- Regional geology
- Environmental remediation
- Holistic ecosystems
- Data synthesis to interpret regional geological evolution of the area
- Palaeoenvironmental interpretation
- Petrogenesis of igneous rocks
- Metamorphic grade (PT-t)
- Structural evolution
- Section balancing
- Polyphase deformation
- 3D/3D modeling
- Geologic cross-sections
- Interpretive report
- Discussive report
- Oral presentation
- Petroleum systems analysis
- Record keeping
- Oral/written communication
- Project management
- Teamwork
- Independent critical thinking
- Transferable skills
- Foundation descriptive skills
- Advanced descriptive skills
- Interpretative skills and deep analysis

Outside between either Tenerife or Almeria trips. Your personal tutor will be able to advise you in making the appropriate choice.