



Department of Earth and Planetary Sciences



**DEPARTMENT HANDBOOK
AND
DESCRIPTION OF COURSES
2011/12**

This pamphlet should be read in conjunction with the College Prospectus and the information it contains is subject to the terms and conditions set out in the College Prospectus

Table of Contents

	Page no
Introduction	3
Modules Available for Study in the Department of Earth and Planetary Sciences	3
Programmes of Study in the Department of Earth and Planetary Sciences	4
Certificates and Advanced Certificates	4
Non-degree information	4
Degree flow diagram	5
BSc Programmes: Options	6
BSc Geology	7
BSc Environmental Geology	8
BSc Earth Sciences	8
BSc Planetary Science with Astronomy	9-10
Certificate in Geology	11
Certificate in Planetary Geology	11
Certificate in Earth History and Palaeontology	11
Certificate in Mineralogy and Volcanology	11
Certificate in Forensic Geology	12
Graduate Certificate in Geology	12
Graduate Certificate in Environmental Geology	12
GENERAL INFORMATION FOR STUDENTS	13
Map and Thesis/Project submission information	14
INTRODUCTION TO GEOLOGY <i>30 credits</i> EASC001S4	15
GEOPHYSICS <i>15 credits</i> EASC005H5	16
MAP & THESIS <i>30 credits</i> EASC007S6	17
STRUCTURAL GEOLOGY I <i>15 credits</i> EASC011H5	18
IGNEOUS PETROLOGY <i>15 credits</i> EASC005H5	19
METAMORPHIC PETROLOGY <i>15 credits</i> SCES006H5	20
PRINCIPLES OF SEDIMENTOLOGY <i>15 credits</i> EASC013S5	21
STRUCTURAL GEOLOGY II <i>15 credits</i> EASC018H6	22
ADVANCED PALAEOONTOLOGY <i>15 credits</i> EASC021H6	23
MAGMATIC PROCESSES <i>15 credits</i> EASC029H6	24
EXPLORATION GEOPHYSICS <i>15 credits</i> EASC032H6	25
ENVIRONMENTAL GEOLOGY PROJECT <i>15 credits</i> EASC036H6	26
INTRODUCTION TO GEOCHEMISTRY <i>15 credits</i> EASC038H4	27
PALAEOECOLOGY <i>15 credits</i> EASC039H6	28
GLOBAL TECTONICS <i>15 credits</i> EASC041H6	29
INVERTEBRATE PALAEOONTOLOGY <i>15 credits</i> EASC042H4	30
GEOLOGICAL HAZARDS <i>15 credits</i> EASC044H6	31
CHEMISTRY & POLLUTION OF SOIL, AIR AND WATER <i>15 Credits</i> EASC045H6	32
EARTH'S RESOURCES & RAW MATERIALS <i>15 credits</i> EASC048H6	33
EARTH HISTORY <i>15 credits</i> EASC050H4	34
ASSESSED FIELD TECHNIQUES <i>4 x 15 credits</i> EASC053H5, EASC054H5, EASC056H6, EASC055H6	35

FOUNDATIONS OF MINERALOGY <i>15 credits</i> EASC057H4	36
GEOLOGY OF THE SOLAR SYSTEM I <i>15 credits</i> SCES009H4	37
GEOLOGY OF THE SOLAR SYSTEM II <i>15 credits</i> SCES010H5	39
VOLCANISM IN THE SOLAR SYSTEM <i>15 credits</i> EASC059H6	41
INTRODUCTION TO ASTROBIOLOGY <i>15 credits</i> EASC064H6	42
TECTONIC GEOMORPHOLOGY <i>15 credits</i> EASC066H6	43
PROJECT FOR EARTH SCIENCES <i>30 credits</i> EASC070S6	44
PROJECT FOR BSc GEOLOGY	45
PROJECT FOR PLANETARY SCIENCES <i>30 credits</i> EASC072S6	46
ADVANCED TOPICS IN PLANETARY SCIENCE <i>15 credits</i> EASC072H6	47
FOUNDATIONS OF ASTRONOMY <i>15 credits</i> SCES001H4	48
FORENSIC GEOLOGY <i>15 credits</i> EASC074H6 <u>distance learning option ONLY</u>	49
EXAMINATIONS	50
Guidelines for awarding classified marks	53
Plagiarism Statement	54
Disability Statement for the Department of Earth and Planetary Sciences	55
The Disability Office	55
Contacts in the Department of Earth and Planetary Sciences	57

Introduction

This pamphlet provides a guide to the BSc and Certificate programmes given in the Department of Earth and Planetary Sciences at Birkbeck. The prerequisites defined for each course are in terms of modules at Birkbeck; exemptions and equivalent modules elsewhere can be considered.

Modules Available for Study in the Department of Earth and Planetary Sciences

This is a comprehensive list of modules we offer. You will find further information about these modules in the main body of this pamphlet. Modules are listed according to level, with introductory modules listed as “first year” to advanced modules listed as “third and fourth year.” Keep in mind that depending on which program you are enrolled on, different restrictions and requirements may apply to your modules’ choices. See below for details on compulsory modules for our BSc and Certificate programs. The modules listed mostly have a value of 15 credits (i.e. half-modules), except where indicated otherwise.

1st year	EASC001S4	Introduction to Geology (30 credits)
	EASC057H4	Foundations of Mineralogy
	EASC038H4	Introduction to Geochemistry
	EASC042H4	Invertebrate Palaeontology
	EASC050H4	Earth History
	EASC053H4	Assessed Field Techniques 1
	SCES010H5	Geology of the Solar System I
SCES001H4	Foundations of Astronomy	

2nd year	EASC005H5	Geophysics
	EASC011H5	Structural Geology I
	EASC005H5	Igneous Petrology
	EASC006H5	Metamorphic Petrology
	EASC013S5	Principles of Sedimentology
	EASC054H5	Assessed Field Techniques 2
	EASC064H5	Introduction to Astrobiology
	EASC074H5	Forensic Geology
SCES010H5	Geology of the Solar System 2	

The following modules are given in alternate years:

3rd and 4th year	EASC018H6	Structural Geology II
	EASC021H6	Advanced Palaeontology
	EASC029H6	Magmatic Processes
	EASC059H6	Volcanism of the Solar System
	EASC041H6	Global Tectonics
	EASC048H6	Earth's Resources & Raw Materials
	EASC055H6	Assessed Field Techniques 3
	EASC032H6	Exploration Geophysics
	EASC039H6	Palaeoecology
	EASC044H6	Geological Hazards
	EASC045H6	Chemistry and Pollution of water, air and soil
	EASC066H6	Tectonic Geomorphology
	EASC056H6	Assessed Field Techniques 4

These modules are independent study modules, usually taken in the 4th year and are specific to different degree programmes:

EASC007S6	Mapping & Thesis (30 credits) BSc Geology
EASC070S6	Project BSc Earth Sciences (30 credits)
EASC036S6	Environmental Geology Project (30 credits)
EASC071S6	Project BSc Geology (30 credits)
EASC072S6	Project BSc Earth and Planetary Science (30 credits)
EASC072H6	Advanced Topics in Planetary Science (15 credits)

Programmes of Study in the Department of Earth and Planetary Sciences

BSc degrees

We offer four different BSc degrees:

- BSc Geology (accredited by the Geological Society) (Full-time route now available)
- BSc Environmental Geology
- BSc Earth Sciences
- BSc Planetary Science with Astronomy

Most BSc students take four years to complete their degrees, studying for an average of 3 evenings a week. All of our lectures are video recorded and can be downloaded from our electronic learning environment. Please note that the BSc in Earth and Planetary Science has been replaced by the BSc in Planetary Science with Astronomy.

Certificates and Advanced Certificates

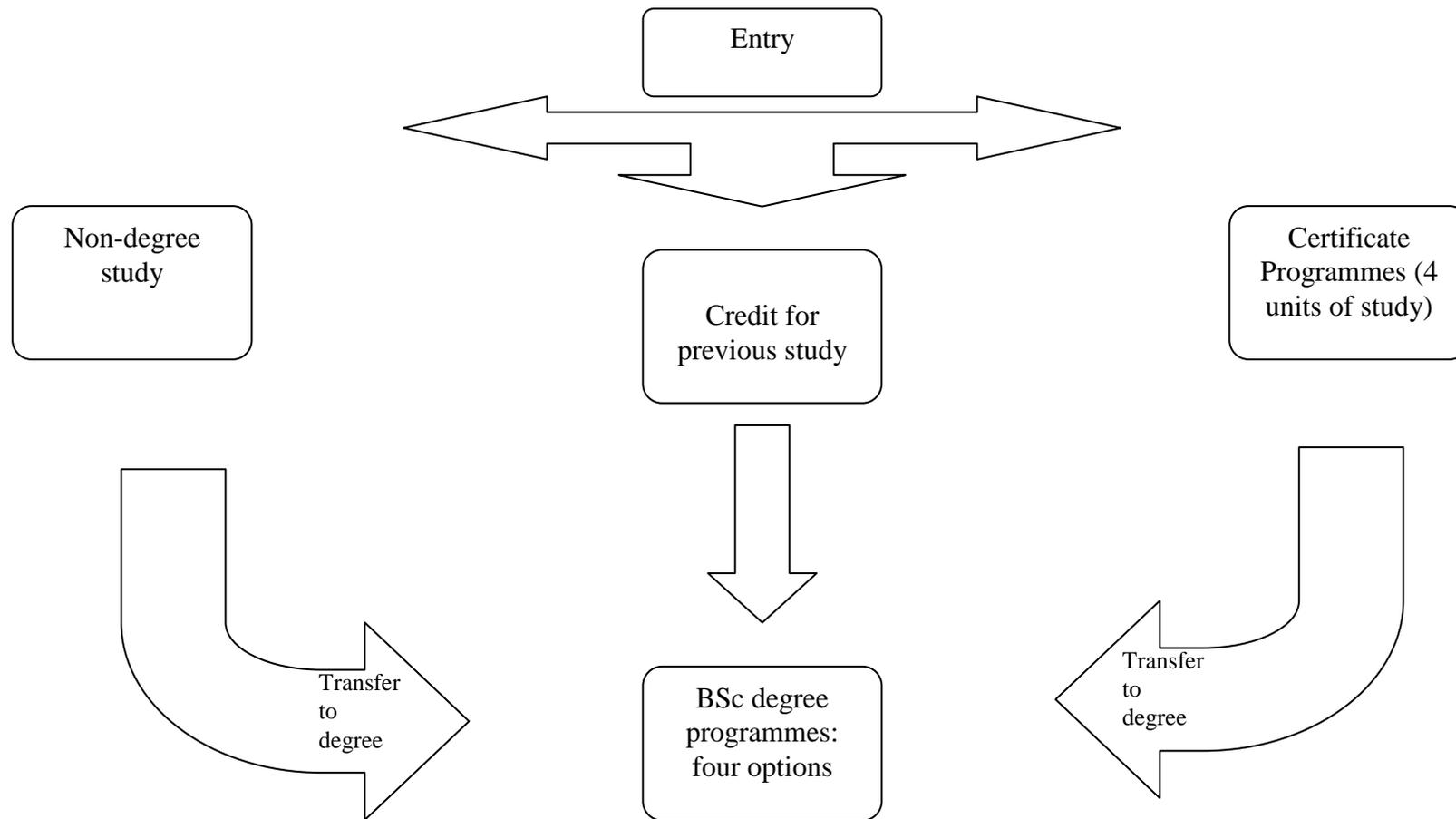
We offer a range of Certificates and Advanced Certificates, designed to enhance expertise in particular subject areas within the Earth and Planetary Sciences. Certificate and Advanced Certificate students may transfer up to a BSc degree program at any point before completion of their Certificate requirements. The certificates offered are:

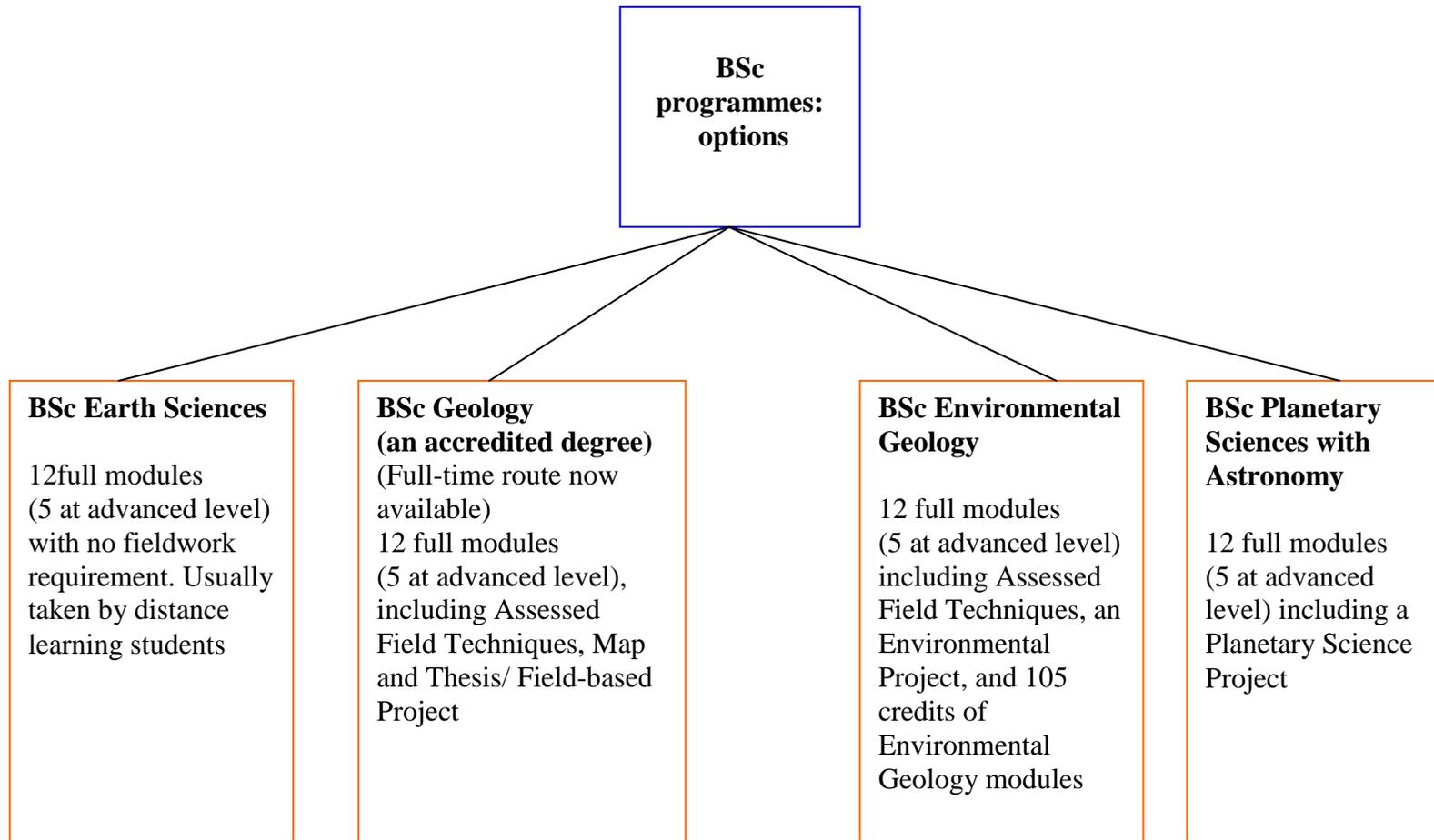
- Certificate in Geology
- Certificate in Planetary Geology
- Certificate in Mineralogy and Volcanology
- Certificate in Earth History and Palaeontology
- Certificate in Field Geology
- Certificate in Forensic Geology
- Advanced Certificate in Geology
- Advanced Certificate in Environment Geology

Non-degree students

Non-degree students may take exams, but their credits do not count toward an academic qualification. Non-degree students who decide they want to transfer up to a BSc programme should do so as soon as possible. There are limits on the number of modules studied at a non-degree level that can be transferred to a degree programme, any transfer will be subject to approval by the Degrees Committee.

The following two pages show a flowchart outlining possible progression routes through the various study programmes toward completion. Below you will find more detailed information about course requirements for BSc degrees and Certificates.





BSc Geology

The BSc Honours degree in Geology is accredited by the Geological Society. It normally extends over four years. Students take a total of twelve full modules, of which 5 must be at advanced level (3rd/4th year optional modules). It is compulsory to take four Assessed Field Techniques half-modules and the full module of either Map & Thesis or field-based Geology Project.

Some modules at 1st and 2nd year level are designed for other degree programmes, and are not part of the compulsory curriculum for BSc Geology students. It is possible for BSc Geology students to take these modules if they wish, but they may not substitute these modules for any of the required modules listed below, and students are advised to consult with their tutor before taking any optional 1st/ 2nd year modules, since grades earned may not ultimately count toward their degree. The modules available are as follows (except where indicated, most are ½ modules whose values are 15 credits).

1st year	<i>Compulsory 1st year modules (given every year)</i>	
	EASC001S4	Introduction to Geology (30 credits)
	EASC057H4	Foundations of Mineralogy
	EASC038H4	Introduction to Geochemistry
	EASC042H4	Invertebrate Palaeontology
	EASC050H4	Earth History
	EASC053H4	Assessed Field Techniques 1
	<i>optional 1st year module</i>	
	SCES010H5	Geology of the Solar System I
	SCES001H4	Foundations of Astronomy
2nd year	<i>Compulsory 2nd year modules, given every year</i>	
	EASC005H5	Geophysics
	EASC011H5	Structural Geology I
	EASC005H5	Igneous Petrology
	EASC006H5	Metamorphic Petrology
	EASC008H5	Principles of Sedimentology
	EASC054H5	Assessed Field Techniques 2
	<i>optional 2nd year modules</i>	
	EASC064H5	Introduction to Astrobiology
	EASC074H5	Forensic Geology
	SCES010H5	Geology of the Solar System 2
	These modules are given in alternate years:	
3rd and 4th year	EASC018H6	Structural Geology II
	EASC021H6	Advanced Palaeontology
	EASC029H6	Magmatic Processes
	EASC041H6	Global Tectonics
	EASC048H6	Earth's Resources & Raw Materials
	EASC055H6	Assessed Field Techniques 3 (<i>compulsory</i>)
	EASC059H6	Volcanism in the Solar System
EASC039H6	Palaeoecology	

EASC044H6	Geological Hazards
EASC045H6	Chemistry and Pollution of water, air and soil
EASC066H6	Tectonic Geomorphology
EASC056H6	Assessed Field Techniques 4 (<i>compulsory</i>)
EASC032H6	Exploration Geophysics

Compulsory 4th year module

Either	EASC007S6	Mapping & Thesis (30 credits)
Or	EASC071S6	Project for BSc Geology (30 credits)

BSc Environmental Geology

The requirements for the BSc Environmental Geology degree are similar to those of the BSc Geology, outlined above, with some exceptions. The course normally extends over four years. Students take a total of twelve modules, of which 5 must be at an advanced level.

It is compulsory to take the 4 Assessed Field Techniques classes. While the 3rd/4th year modules are optional, it is compulsory to take at least three ½ modules of Environmental Geology. The Environmental Geology modules are: Earth's Resources and Raw Materials, Tectonic Geomorphology, Geological Hazards, and Chemistry and Pollution of Water, Air and Soil. The module "Environmental Geology Project" is also compulsory.

Please refer to the list outlined under "BSc Geology" for the modules available from first year to fourth year level on the BSc Environmental Geology. Please also note that the same restrictions apply to students wishing to take any of the optional 1st or 2nd year modules.

BSc Earth Sciences

The BSc Earth Sciences is a degree, designed particularly with the Distance Learner in mind. The main difference between this degree and the BSc Geology is that there is no specified fieldwork requirement. Students take a total of twelve modules, of which 5 must be at an advanced level.

Some modules at 1st and 2nd year level are designed for other degree programs, and are not part of the compulsory curriculum for BSc Earth Science students. It is possible for BSc Earth Science students to take these modules if they wish, but they may not substitute these modules for any of the required modules listed below, and students are advised to consult with their tutor before taking any optional 1st/ 2nd year modules, since grades earned may not ultimately count toward their degree. The modules available are as follows (module value 15 credits except where indicated).

	<i>Compulsory 1st year modules (given every year)</i>	
	EASC001S4	Introduction to Geology (30 credits)
1st	EASC057H4	Foundations of Mineralogy
year	EASC038H4	Introduction to Geochemistry
	EASC042H4	Invertebrate Palaeontology
	EASC050H4	Earth History

optional 1st year modules

SCES010H5 Geology of the Solar System I
EASC053H4 Assessed Field Techniques 1

Compulsory 2nd year modules, given every year

**2nd
year** EASC005H5 Geophysics
EASC011H5 Structural Geology I
EASC0XXX Igneous Petrology
EASC0XXX Metamorphic Petrology
EASC013S5 Principles of Sedimentology

optional 2nd year modules

EASC064H5 Introduction to Astrobiology
EASC054H5 Assessed Field Techniques 2
EASC074H5 Forensic Geology
SCES010H5 Geology of the Solar System 2

The following modules are given in alternate years:

**3rd and
4th year** EASC018H6 Structural Geology II
EASC021H6 Advanced Palaeontology
EASC029H6 Magmatic Processes
EASC041H6 Global Tectonics
EASC048H6 Earth's Resources & Raw Materials
EASC055H6 Assessed Field Techniques 3
EASC059H6 Volcanism of the Solar System
EASC039H6 Palaeoecology
EASC044H6 Geological Hazards
EASC045H6 Chemistry and Pollution of Water, Air and Soil
EASC066H6 Tectonic Geomorphology
EASC056H6 Assessed Field Techniques 4
EASC032H6 Exploration Geophysics

Compulsory 4th year module

EASC070S6 Project for Earth Science (30 credits)

BSc Planetary Science with Astronomy

This degree is designed to give students a broad introduction to the Earth and Planetary sciences within their wider astronomical context. The course includes a strong emphasis on the geological investigations of the planets and moons of the Solar System, as well as introductory modules on astronomy and astrobiology (the search for life in the Universe). This degree is exempt from the ELQ surcharge for those students who already have a BSc or BA.

All students on this degree programme study the same modules in the first two years and then choose from a wide array of options in their final two years. Students take a total of twelve modules, of which 5 must be at an advanced level. The modules available are as follows (module values are 15 credits except where indicated).

	<i>Compulsory 1st year modules (given every year)</i>	
1st year	EASC001S4	Introduction to Geology (30 credits)
	SCES010H5	Geology of the Solar System I (15 credits)
	EASC038H4	Introduction to Geochemistry
	EASC057H4	Foundations of Mineralogy
	SCES001H4	Foundations of Astronomy

Optional 1st year half-module (given every year)
EASC054H5 Assessed Field Techniques 1

	<i>Compulsory 2nd year modules, given every year</i>	
2nd year	SCES010H5	Geology of the Solar System II
	EASC005H5	Igneous Petrology
	EASC006H5	Metamorphic Petrology
	EASC064H5	Introduction to Astrobiology
	EASC005H5	Geophysics

	<i>Optional modules</i>	
2nd year	SCE006H5	Metamorphic Petrology
	EASC050H5	Earth History
	EASC011H5	Structural Geology I
	EASC054H5	Assessed Field Techniques 1 or 2
	PHAS1130	Observational Astronomy (at UCL)

	<i>Compulsory 3rd / 4th year modules</i>	
3rd and 4th years	EASC059H6	Volcanism in the Solar System
	EASC0XXX (?)	Comets, Asteroids and Meteorites
	SCES003H6	Physics of the Sun
	EASC072H6	Advanced Topics in Planetary Science
	EASC072S6	Project for Planetary Sciences (30 credits)

Optional 3rd and 4th year modules given in alternate years:

EASC018H6	Structural Geology II
EASC029H6	Magmatic Processes
EASC041H6	Global Tectonics
EASC048H6	Earth's Resources & Raw Materials
EASC055H6	Assessed Field Techniques 3 and 4
EASC044H6	Geological Hazards
EASC045H6	Chemistry and Pollution of water, air and soil
EASC066H6	Tectonic Geomorphology
EASC056H6	Assessed Field Techniques 4
EASC032H6	Exploration Geophysics

You may also take modules in other subjects, including optional field course modules, to complement your geological studies or to broaden your scientific background and skills.

Certificates

Most of our certificates require students to study over a period of 2 years, earning a total of 4 full modules (120 credits). Some modules are compulsory depending on the subject specialisation, and some modules are optional. Students may transfer from certificate to BSc level at any time prior to completion of the modules designated for the certificate. Below you will find details of module requirements for our certificate programmes.

Certificate in Geology

You can choose a total of four full modules from Years 1 and 2 of the BSc Geology degree.

Certificate in Planetary Geology

Year 1:

Introduction to Geology, Geology of the Solar System I, Foundations of Astronomy

Year 2:

Plus a choice of 43 half- modules from: Geology of the Solar System II, Introduction to Astrobiology, Introduction to Geochemistry; Foundations of Mineralogy; Geophysics; Global Tectonics; Introduction to Astrobiology; Assessed Field Techniques; Volcanism in the Solar System.

Certificate in Earth History and Palaeontology

Year 1

Compulsory modules: Introduction to Geology (30 credits); Earth History; Invertebrate Palaeontology.

Year 2

One compulsory half module: Principles of Sedimentology
Choice of two half modules from: Advanced Palaeontology, Palaeoecology, Tectonic Geomorphology, or Introduction to Astrobiology.

Certificate in Mineralogy and Volcanology

Year 1:

Compulsory modules: Introduction to Geology (30 credits); Introduction to Geochemistry; Foundations of Mineralogy.

Year 2

Two compulsory half-modules: Igneous Petrology (15 credits); Metamorphic Petrology (15 credits)
Choice of two half-modules from: Magmatic Processes, Volcanism in the Solar System, or Earth's Resources and Raw Materials.

Certificate in Forensic Geology

Year 1

Two compulsory modules: Introduction to Geology (30 credits), Introduction to Geochemistry; Invertebrate Palaeontology

Year 2

Two compulsory modules: Principles of Sedimentology Palaeoecology; Forensic Geology

Graduate Certificate in Geology

You can choose a total of 3 full modules (90 credits) from Years 3 and 4 of the BSc Geology degree.

Graduate Certificate in Environment Geology

You can choose a total of 3 full modules (90 credits) from Years 3 and 4 of the BSc Environmental Geology degree.

General Information for Students in Earth and Planetary Sciences

The recommended reading lists given are not intended to be comprehensive, and in advanced modules in particular further references (including original literature) will be given. For 3rd & 4th year modules it is essential for students to begin relevant reading during the summer vacation. Books suggested for purchase by students are indicated by an asterisk, but in some modules the relative merits of possible alternatives will be discussed by the lecturer.

Normal teaching is in the evenings between 6pm and 9pm, and the normal pattern is for a lecture (about one hour) to be followed by related practical work after a short break. Graduate demonstrators are employed to assist with larger practical classes. Classes are held each week during the autumn and spring terms. Half module units will consist of 11 weeks of lectures during either the autumn or spring term, followed by revision for each module in the summer term. Friday evenings are reserved for consolidation, revision and study skills classes, and departure for field classes. **Additional reading, unsupervised study and practical work, and submission of essays etc will be necessary if a module is to be completed satisfactorily. Examinations are usually held in May and June during the day**

Tutorial arrangements

Students entering the first year of the degree are encouraged to consult the Admissions Tutor (Dr Charlie Underwood) should difficulties or problems arise. Following consultations during the second year of the degree, students are assigned to a member of the academic staff who will act as adviser throughout the remainder of the degree. The same member of academic staff will also supervise the assigned student's work in their Mapping & Thesis or Project. Students entering directly the 2nd or 3rd year of the degree will be immediately assigned to an adviser/supervisor.

Fieldwork

For some modules weekend field classes may be organised. Longer field classes during the Easter vacation are generally year-based rather than related to a specific module.

Easter Field Classes

Easter field classes form an integral part of the BSc Geology and BSc Environmental Geology. Apart from exceptional circumstances, **which should be reported to the undergraduate tutor**, the department requires all BSc Geology and Environmental Geology students to attend four such field classes during their course. (This will not apply to the BSc in Earth Sciences or BSc in Planetary Science with Astronomy.) Field-class attendance and performance will contribute to four half modules of Assessed Field Techniques.

Safety on fieldwork

Fieldwork is an activity which involves some special risks and hazards as it takes students onto coastal cliffs and high mountains and into rivers, quarries and mines. Consequently it is vital that all students **read** and **follow** the safety procedure outlined in the safety material provided to them. Students should also be familiar with the Department Fieldwork Safety Code of Practise. All students should submit their signed Student Declaration of Safety Information to the Department Administrator before they attend any field classes.

Exams

Exams are held in the daytime. Please ensure you have made appropriate arrangements for taking leave during the examination period.

Submission of Map & Thesis, Project for Geology, Project for Earth Sciences, Environmental Geology Project, Project for Planetary Sciences & major assessed essays

The following statement must be inserted as part of the requirements for the submission of Project, Environmental Geology Project, Map & Thesis, and major assessed essays:

“This (essay*/report*/dissertation*) is submitted under University of London regulations as part of the examination requirements for the BSc degree in Geology/Environmental Geology/Earth Science/Earth and Planetary Science**. Any quotation or excerpt from the published or unpublished work of other persons is explicitly indicated and in each such instance a full reference to the source of such work is given. I have read and understood the requirements of the Birkbeck College Examinations Instructions to Candidates, including relevant University of London regulations on Examination Tests, and in accordance with those requirements submit this work as my own.

Signed..... “

*insert as appropriate; **delete as appropriate

INTRODUCTION TO GEOLOGY (30 credits) EASC001S4

MAIN OBJECTIVES

To introduce the basic facts and concepts of geology.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic tenets of geology and geophysics with refresher material provided on basic science.

COGNITIVE SKILLS

The student will develop an understanding of hypothesis development and be given examples of hypothesis testing. This will involve theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

The students will be made aware of relevant concepts used in studies of geology and geophysics. They will be trained to use petrographic and binocular microscopes. They will be trained to draw accurate cross-sections across geological and topographic maps.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

The student will gain skills such as writing, comprehension of scientific concepts, mathematical calculation, manipulation of data, independent study, and confidence in their abilities to follow a problem through to its end. They will be proficient in the use of microscopes and have some understanding of the 3-dimensional aspects of geological and topographical maps.

CONTENT

The module deals with the origin and structure of the Earth, the nature of the geological record and the processes which have formed the common rock-types. The course introduces fundamental techniques of geology including the use of the petrographic microscope and the construction and interpretation of geological maps. Major topics include: mineralogy, sedimentology, igneous and metamorphic petrology, structural geology, geophysics and plate tectonics. Identification of minerals and rocks in hand-specimen and thin-section forms a major part of the practical side of the module.

RECOMMENDED READING

Press, F. & Siever, R. 1998. *Understanding Earth*. (2th edition). Freeman.

[An excellent general textbook, attractively produced. Read it].

A dictionary of geology. (Penguin). *[Very useful for the language of geology].*

MacKenzie, W.S. & Adams, R.E. 1994. *A colour atlas of Rocks and Minerals in thin section*. Manson Publishing.

FIELDWORK One 1–day field trip.

MODULE EXAMINATION

One 3-hour theory paper and one 3-hour practical paper.

LECTURER

Dr Pieter Vermeesch

GEOPHYSICS (15 credits) EASC005H5

MAIN OBJECTIVES

Introduce the basic principles of Geophysics

Understand the application of geophysical principles in the study of the Earth's interior

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

To describe the basic principles of seismology, gravity, magnetic and other geophysical methods

To describe how principles of geophysics can be applied to enhance our understanding of the Earth

To apply basic mathematical and physical concepts in the study of geophysics

COGNITIVE SKILLS

To present basic numerical arguments

To explain the relationship between methodologies and geological applications

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

To think quantitatively

To discuss the relationship between geophysical data and geological interpretation

Presentation of scientific ideas through activities

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Interpreting numerical and graphical data

Writing and presentation skills

PREREQUISITES

Introduction to Geology EASC001S4; GCSE mathematics

CONTENT AND ORGANISATION

Introduction to geophysics and seismology, basic seismic refraction and reflection methods, earthquake seismology, isostasy and gravity methods, geomagnetism and magmatic methods, introduction to electrical, electromagnetic and other geophysical methods. Geological applications of seismic gravity and magnetic methods.

RECOMMENDED PRE-COURSE READING

Mussett and Khan, Looking into the Earth: An introduction to geological geophysics. Cambridge University Press

MODULE EXAMINATION

Written examination (60%) and assignments (40%)

LECTURER

Dr Vincent Tong

MAP & THESIS (30 credits) EASC007S6

MAIN OBJECTIVES

To give students experience of independent work on the geological mapping of an area and the preparation of a geological report. Students are expected to spend a total of 6 weeks preparing a geological map of an area. The area will be chosen in consultation with a supervisor and the size of the area will depend on various factors such as topography and geological complexity. In the final year a thesis (maximum length 8000 words) on the geology of the area is prepared. Most of the work is done independently, but students may be visited in the field by their supervisor who will also give advice on cartographic techniques, content of thesis, etc. Two copies of 1:10 000 maps of the area will be supplied by the School. Each student will be allocated a supervisor who will be responsible for advice on all aspects of the course.

COGNITIVE SKILLS

The student will gain knowledge and understanding of the geology of the area they have studied, including the processes which have formed the rocks and the geological history. The student will develop knowledge and understanding of the 3-dimensional relationships between geological units in the field and the chronological and spatial sequence of geological events that have occurred. The student will gain knowledge of the petrology and structures of the rocks in order to develop an understanding of the processes that have formed them.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

The student will learn how to: (1) use geological equipment, to measure aspects of the geology, take structural measurements and navigate on a topographic map; (2) use and understand topographic maps; (3) keep a notebook of his/her method and findings; (4) produce a field map of their findings; (5) construct geological cross-sections; (6) produce a final map using pertinent drafting skills; (7) write a scientific report detailing methods and findings.

GENERAL/TRANSFERABLE SKILLS

The student will learn how to plan and execute an independent research project and produce a report detailing his/her study methods and results including a discussion of the implications of their findings and final conclusions. Although students are expected to work in pairs in the field, the scientific investigations should be carried out independently; students will therefore learn the how to motivate themselves during independent study and work with a partner in the field.

RECOMMENDED READING

Students are expected to be familiar with the literature relating to the geology of their area. A handbook outlining the nature of the module is available from the department and must be read and acted upon.

MODULE EXAMINATION

The map and thesis is assessed by the examiners, supplemented by an oral examination by the two external examiners.

TIMETABLE

Students will be allocated an area and a supervisor normally early in the second year and should begin mapping in the summer vacation, making their own arrangements while agreeing dates with their supervisor.

FIELDWORK COORDINATOR: Mr Steve Hiron

STRUCTURAL GEOLOGY I (15 credits) EASC011H5

MAIN OBJECTIVES

To introduce the basic tenets of structural geology.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic tenets of structural geology and its relationship with plate tectonics.

COGNITIVE SKILLS

The student will develop an understanding of hypothesis development and be given examples of how these might be tested, involving analysis of databases, theoretical understanding of relevant concepts, critical assessment of results and outcomes, and experience of real situations reported in research papers. They will be encouraged to think about the 3-dimensional aspect of geological structures through stereographic projection and map interpretation techniques.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

The student will be made aware of relevant databases and how they might be used in studies of geology and geophysics. They will be trained to read and interpret geological maps. They will be able to plot structural orientation data on stereographic projections to aid 3D visualisation.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

The student will gain skills such as comprehension of scientific data and papers, mathematical calculation, manipulation of data research techniques, independent study, IT skills and confidence in their abilities to follow a problem through to its end. They will be accomplished at map reading/ interpretation and 3D visualisation. They will learn to use an electronic library.

PREREQUISITES

A pass in A-level Geology (or equivalent), or 001S4 Introduction to Geology.

CONTENT AND ORGANISATION

The plate tectonic setting of structures and deformation. Characteristics of tectonic structures: a review of the main features of faults, shear zones, folds, foliations, lineations and deformation fabrics. Formation of tectonic structures: a review of deformation mechanisms and the nature of stress and strain. Structural associations: the geometry and kinematics of thrust, normal and strike-slip fault systems. Development of poly-phase structures. Practical work will include structural interpretation of maps and cross-sections, the representation of structures using stereographic projections and the techniques of field structural geology.

RECOMMENDED READING:

McClay, K. 1987. The mapping of geological structures. Open University Press.

Davis, G.H. and Reynolds, S.J. 1996. Structural Geology of Rocks and Regions. 2nd edition. John Wiley & Sons

Park, R.G. 1989. The Foundations of Structural Geology. 2nd edition. Blackie.

MODULE EXAMINATION One 3 hour theory paper and one 3-hour practical paper.

LECTURER Dr Gerald P Roberts

IGNEOUS PETROLOGY (15 credits) [SCES005H5](#)

MAIN OBJECTIVES

To introduce the main concepts of igneous petrology and to relate the occurrence of igneous rocks to plate tectonics and orogenic activity. To introduce students to the study of igneous rocks by means of the petrological microscope so that students can identify and interpret their mineralogy and textures.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understanding the chemistry and mineralogy of igneous rock; relating igneous rocks to plate tectonics; understanding of basic petrogenetic processes.

COGNITIVE SKILLS

Interpreting information derived from thin-section and hand-specimen analysis; developing reasoning based on evidence from mineralogy and chemistry of rocks.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Basic scientific literacy; understanding of binary and ternary phase diagrams; ability to place various types of rock in a plate tectonic context

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Interpreting numerical and chemical data; writing scientific descriptions of rock samples; writing and presentation skills; use of graphs and diagrams.

PREREQUISITES

A pass in Introduction to Geology, Foundations of Mineralogy, or an equivalent course.

CONTENT AND ORGANISATION

The recognition, geological occurrence and petrogenesis of common igneous rocks. Classification of igneous rocks; recognition of rock-structure and textures; the generation and consolidation of magma; the use of experimental data from natural and synthetic melts; the relationship between metamorphism, igneous activity and plate tectonics. The integration of descriptive and interpretative petrology is the main aim of practical work.

RECOMMENDED READING

Best, M.G. 1982. *Igneous and Metamorphic Petrology*. Freeman. *[A good all-round text]*.

Gill RCO 2010: *Igneous Rocks and Processes – a practical guide*. Wiley

A 2nd hand copy of Kerr's "Optical Mineralogy" will be very useful.

FIELDWORK: One weekend field class in Cornwall (with Metamorphic Petrology)

MODULE EXAMINATION

One 3-hour combined theory and practical paper.

LECTURER: Professor Hilary Downes

METAMORPHIC PETROLOGY (15 credits) SCES006H5

MAIN OBJECTIVES

To introduce the main concepts of metamorphic petrology and to relate the occurrence of metamorphic rocks to plate tectonics and orogenic activity. To introduce students to the study of metamorphic rocks by means of the petrological and binocular microscope so that students can identify and interpret their mineralogy and textures.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understanding the chemistry and mineralogy of metamorphic rock; relating metamorphic rocks to plate tectonics; understanding of basic petrogenetic processes.

COGNITIVE SKILLS

Interpreting information derived from thin-section and hand-specimen analysis; developing reasoning based on evidence from mineralogy and chemistry of rocks.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Basic scientific literacy; ability to place various types of rock in a plate tectonic context.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Interpreting numerical and chemical data; writing scientific descriptions of rock samples; writing and presentation skills; use of graphs and diagrams.

PREREQUISITES

A pass in Introduction to Geology, Foundations of Mineralogy, or an equivalent module.

CONTENT AND ORGANISATION

The recognition, geological occurrence and petrogenesis of common metamorphic rocks. Classification of metamorphic rocks; recognition of rock-structure and textures; relationship between metamorphism and plate tectonics. The nature of metamorphic reactions; metamorphic grade; metamorphic facies; high- and low-pressure metamorphism. The integration of descriptive and interpretative petrology is the main aim of practical work.

RECOMMENDED READING

The books listed below are all very good but of very different styles. I would recommend you look in the library (if possible) before you purchase to see which suits best.

Best, M.G. 1982. *Igneous and Metamorphic Petrology*. Freeman. *[A good all-round text]*.

Yardley, B.W.D. 1989. *An introduction to metamorphic petrology*. Longman. *[Essential. An excellent all-round text. Buy it]*.

Winter, J.D. 2001. *An Introduction to Igneous and Metamorphic Petrology*. Prentice Hall ISBN 0-12-240342-0. *[A very readable book]*

FIELDWORK: One weekend field class in Cornwall (optional)

MODULE EXAMINATION

One 3-hour combined theory and practical paper;

LECTURER: Mr Steve Hiron

PRINCIPLES OF SEDIMENTOLOGY (15 credits)SCES008H5

MAIN OBJECTIVES

Introduction to sedimentary processes; Instruction in Sedimentary petrography; Introduction to facies analysis; Illustration of clastic and carbonate sedimentary environments; Introduction to sequence stratigraphy.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Description of sedimentary petrography and diagenesis. Understanding of sedimentary processes and environments. Interpretation of sedimentary environments.

COGNITIVE SKILLS

Data analysis and critical assessment of varied data sets. Extracting relevant data and justifying interpretations. Thinking in 3-D.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Sedimentary petrography. Use of microscope. Facies analysis in carbonate and clastic sediments. Correlation. Palaeoenvironmental reconstruction.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Ability to select relevant information from multiple data sets; Make rational interpretations from proxy data; Handling uncertainty.

PREREQUISITES

Normally a pass in A-level Geology or Introduction to Geology or equivalent.

CONTENT AND ORGANISATION

Introduction, weathering, erosion and geomorphology. Sandstone petrography and diagenesis. Carbonate petrography and diagenesis. Sedimentary facies analysis. Alluvial, deltaic, coastal, shallow and deep marine environments. Controls on sedimentation, sequence stratigraphy.

RECOMMENDED READING

*Adams, et al. Atlas of sedimentary rocks under the microscope. Longman.
[Valuable reference for thin section work].

*Boggs, S. Principles of Sedimentology and Stratigraphy. Merrill.

*Tucker, M.E. Sedimentary Petrology. 3rd edition. Blackwell.

+Leeder, M. 1982. Sedimentology. George Allen & Unwin.

+Selley, R.C. 1980. Ancient Sedimentary Environments. Chapman & Hall.

*course texts

+additional reading

FIELDWORK

One weekend field class examining modern and ancient sedimentary environments.

MODULE EXAMINATION

One essay (20%) 3 hour practical examination (80%)

LECTURERS

Dr Charlie Bristow, Dr Andy Carter

STRUCTURAL GEOLOGY II (15 credits) EASC018H6

MAIN OBJECTIVE

To address topics of current interest in structural geology and tectonics.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of advanced concepts in structural geology and their relationships with plate tectonics, the hydrocarbon and minerals industries and seismic hazard analysis.

COGNITIVE SKILLS

Hypothesis development and testing using analysis of databases, theoretical understanding of relevant concepts, critical assessment of results and outcomes. Drawing and interpreting geological cross-sections using advanced section balancing techniques.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Awareness of relevant databases and their use in studies of geology and geophysics. Reading and interpreting geological maps. Interpreting seismic reflection profiles in terms of structural geology. Interpreting the microstructural evolution of fault zones using a petrological microscope.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Writing, comprehension of scientific data and papers, mathematical calculation, manipulation of data using relevant software/research techniques, independent study, IT skills. Use of an electronic library. Map reading/ interpretation and 3D visualisation, cross-section construction, interpretation of seismic reflection data and microstructural interpretation.

PREREQUISITES A good pass in Structural Geology I or equivalent.

CONTENT AND ORGANISATION

Methods used for validating cross-sections to investigate the significance of strain accumulation during formation of fault-related folds. Data from the Western Alps to assess the links between the superficial and deep structure. Data from areas of continental extension to assess structural geometries and mechanisms of continental extensional tectonics. Theoretical models of faulting, case studies of earthquakes and rock deformation experiments to assess the links between fluid migration, faulting and earthquakes. Compressional structures in pre-existing extensional basins; Inversion Tectonics. Structures associated with emplacement of salt bodies and igneous intrusions; interplay between regional tectonic stresses and gravitational forces.

PRACTICAL WORK

Examination of structural geometries on published maps and cross-sections; Interpretation of deep seismic reflection profiles, seismic refraction profiles and gravity data; Interpretation of seismic reflection profiles from oil and gas fields; Mohr diagrams; Flinn plots and the centre-to-centre methods of strain analysis; Restoration of cross-sections using line-length and excess-area methods; Examination of the microstructures and deformation mechanisms of brittle fault-rocks.

RECOMMENDED READING Recent research papers will be recommended.

MODULE EXAMINATION One 3-hour theory paper and one 3-hour practical paper.

LECTURER Dr Gerald P Roberts

ADVANCED PALAEOLOGY (15 credits) EASC021H6

MAIN OBJECTIVES

The module will give students an understanding of a range of topics relevant to the classification, study, and use of fossils. This will give an overview of palaeontology as a science and the nature and mode of palaeontological study. One or more of these aspects will be used in a palaeontological project.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

- The classification of organisms
- Field and laboratory techniques
- Evolution and the fossil record
- Relating fossils to living organisms
- The application of fossils in dividing geological time

COGNITIVE SKILLS

- Observational skills

SUBJECT SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

- Techniques in collecting and studying fossils in the field.
- Taxonomy
- Use of fossils in relative dating
- Relating fossil and living organisms

PREREQUISITES

Invertebrate Palaeontology or equivalent

CONTENT AND ORGANISATION

- Principles of classification
- Methods in palaeontological research
- Evolution and the fossil record
- Fossils as organisms
- Uses of fossils
- Micropalaeontology

RECOMMENDED READING

To be introduced during the course.

FIELDWORK

None. Personal fieldwork or museum work possible.

MODULE EXAMINATION

One 3 hour theory examination (70%).

Project (30%)

LECTURER Dr Charlie Underwood.

MAGMATIC PROCESSES (15 credits) EASC029H6

OBJECTIVES

To introduce modern concepts of petrogenesis, including the major magmatic processes. To show the importance of geochemical data in the study of igneous petrology. To introduce students to the integration of thin-section petrography and geochemical data in order to understand the origin of suites of igneous rocks.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understanding modern concepts of igneous petrology

Relating petrographic and geochemical information to deduce origin of igneous rocks

COGNITIVE SKILLS

Interpreting information from thin-sections and integrating this with geochemical data

Developing reasoning based on evidence from thin-section observations and geochemical data

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Handling data in form of tables and graphs; Interpreting data, including chemical variation diagrams, isotope diagrams and trace element figures.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Interpreting data; Numeracy; Scientific literacy; Use of graphs and tables.

PREREQUISITES

A pass in Igneous & Metamorphic Petrology (after 2011, a pass in Igneous Petrology).

CONTENT AND ORGANISATION

The course will cover the following topics: the generation of magmas, their subsequent behaviour and evolution; application of trace elements and radiogenic isotopes to the study of the origin of igneous rocks. Tectonic setting of major igneous rock associations. Processes at constructive and destructive plate margins. Origin and evolution of alkaline rocks. Evidence for crustal contamination, magma mixing and liquid immiscibility in the formation and evolution of magmas. Practicals will consist of petrographic examination and description of igneous rocks in thin section, plus the application of chemical calculations to petrogenetic problems.

RECOMMENDED READING

*Wilson, M. Igneous Petrogenesis. 1988. Unwin Hyman (recommended)

N.B. A scientific calculator and optical mineralogy textbook (such as a 2nd hand copy of Kerr's "Optical Mineralogy") will be essential for practical work.

MODULE EXAMINATION

One 3-hour theory paper (50%) and a portfolio of practical work (50%).

LECTURER

Professor Hilary Downes

EXPLORATION GEOPHYSICS (15 credits) EASC032H6

MAIN OBJECTIVES

To introduce the principles of geophysical methods used in investigating shallow crustal structures; To apply the geophysical principles to a wide range of scientific and engineering investigations

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

To describe and explain key principles of exploration geophysics; To evaluate the relationship between the principles of exploration geophysics and their applications; To assess the limitations of geophysical methods

COGNITIVE SKILLS

To develop numerical arguments; To evaluate methodologies by taking into account applications in a wide range of scientific and engineering contexts

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

To understand and synthesise original research findings; To think quantitatively; To discuss the relationship between geophysical data and geological interpretation; Poster presentation skills

PREREQUISITES

Introduction to Geology (EASC001S4), Geophysics (EASC005H5)

CONTENT AND ORGANISATION

Part One: Seismic methods and their applications

Using mid-ocean ridges as the main geological example, the first part of the module examines the principles and use of seismic tomography, seismic reflection and time-lapse seismic monitoring methods.

Part Two: Why apply more than one geophysical method? One method, many applications?

Using electromagnetic, electrical and gravity methods as examples, the second part of the module examines 1) the advantages of applying more than one geophysical method for a given setting, and 2) how a given geophysical method can have a wide range of applications. Examples include glaciology, civil engineering, hydrology and petroleum exploration.

COURSE BOOK E.J.W. Jones, Marine Geophysics, Wiley; Selected journal articles

SUPPLEMENTARY TEXTBOOK C.M.R. Fowler, The Solid Earth, 2nd edition, Cambridge University Press

MODULE EXAMINATION

Written examination (80%) and Report/poster (20%)

LECTURER

Dr Vincent C H Tong

ENVIRONMENTAL GEOLOGY PROJECT (30 credits) EASC036H6

MAIN OBJECTIVES

To give students experience of independent work on a topic of environmental geological interest, normally including some field work (e.g., sampling of environmental materials) and the preparation of a scientific report.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic tenets of the particular area of environmental geology for the project.

COGNITIVE SKILLS

Hypothesis development and testing skills through analysis of the data obtained for their project, theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations during the project work.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Collection and analysis of data relevant to the area of environmental geology related to their project using a variety of research techniques. The student will be able to critically assess the quality of the scientific method, data, results, conclusions and implications of relevant studies.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

The student will gain skills such as writing, comprehension of scientific data and papers, manipulation of data using relevant software/research techniques, independent study, IT skills and confidence in their abilities to follow a problem through to its end.

CONTENT AND ORGANISATION

Students will be expected to choose a topic in consultation with a supervisor, who will also give instructions regarding field techniques and any laboratory work that is required for the project. Most of the work will be done independently. If field work/mapping is involved, two copies of 1:10 000 maps of the field area will be supplied by the School of Earth Sciences. If thin sections or laboratory analyses are necessary, these will be done in the School after consultation with the supervisor. Students may be required to pay for the cost of other materials used in the project. Time spent on the project will normally be equivalent to that expected for the map and thesis. The project report will normally be up to 15,000 words.

RECOMMENDED READING

Students are expected to be familiar with the literature relating to their topic. A handbook giving guidelines for this module is available from the department.

MODULE EXAMINATION

The quality of the project and report is assessed by the examiners, supplemented by an oral examination by the two external examiners.

LECTURERS

Each student will be allocated a supervisor (normally Dr Karen Hudson-Edwards or Dr Charlie Bristow) who will be responsible for advice on all aspects of the course.

INTRODUCTION TO GEOCHEMISTRY (15 CREDITS) EASC038H4

MAIN OBJECTIVES

To provide the principles of inorganic chemistry necessary for an understanding of mineralogy, petrology and low-temperature geological processes. To develop the mathematical skills necessary for understanding these inorganic chemical principles. To develop practical skills in solving geochemical problems through a series of written exercises.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understanding of abstract concepts in geochemistry. Ability to recognise specific groups of chemical elements and their role in geological processes. Ability to see the relevance of chemistry in other areas of geology. Awareness of micro- and macro-scales in geochemistry.

COGNITIVE SKILLS

Synthesise information on a variety of geochemical topics. Ability to relate specific chemical knowledge to a geological context. Ordering and prioritising. Pragmatic thinking and analysis

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Graph construction and interpretation. Mathematical skills. Ability to think in 3 dimensions. Balancing chemical equations. Ability to prepare and write summaries of chemical concepts.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Mathematical skills; writing skills; self-motivation, time management, and organisation; data analysis, ability to write concise reviews of technical subjects

PREREQUISITES

None

CONTENT AND ORGANISATION

Atomic structure; the periodic table; bonding and electronegativity; chemical reactions and formulae; chemical equilibrium; the nature of minerals; properties of water and solutions; the phase rule and elementary phase diagrams; kinetics of geological processes; thermo-dynamics; the chemistry of the Earth; the use of isotopes in geology.

Bi-weekly assignments including chemical calculations will be set and discussed in class.

ASSESSMENT

The module will be assessed by five bi-weekly exercises (worth 40% of final mark), and an examination (worth 60% of final mark).

MODULE TEXT

Chemical fundamentals of Geology, R C O Gill (Unwin Hyman). 2nd edition.

LABORATORY WORK

None

LECTURER

Dr Karen Hudson-Edwards

PALAEOECOLOGY (15 credits) EASC039H6

MAIN OBJECTIVES

The module will introduce and build upon the principles and applications of fossil preservation, ecology of fossil organisms and the changes in life through geological time. The module concentrates on applications of theory and enhances relevant skills in addition to knowledge.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Fossil preservation involving both biotic and geological processes; Nature of bias within the fossil record; Exceptional fossil assemblages and their significance; Relationships between fossil assemblages and their depositional and preservational palaeoenvironments; Biotic and abiotic limitations on the spatial and temporal distribution of organisms; The nature of extinction events.

COGNITIVE SKILLS

Observational skills using hand specimens and in the field. Detailed recording of quantitative and qualitative data.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Interpretation of fossil assemblages. Interpretation of palaeoenvironments

GENERAL/TRANSFERABLE SKILLS

Detailed observation. Interpretation based on incomplete data. Time and project management. Integration of theory. Written presentation skills. Oral presentation skills.

PREREQUISITES

Invertebrate Palaeontology, Principles of Sedimentology, Earth History

CONTENT AND ORGANISATION

Decay, quality of assemblages; scavenging, transport; shell beds; diagenesis; exceptional faunas. Marine environment and palaeoenvironment; Communities, tiering, diversity; replacement; Trace fossil assemblages; Palaeobiogeography.

RECOMMENDED READING

Brewchley, PJ and Harper, DAT. 1998. Palaeocology: Ecosystems, Environments, and Evolution. Chapman and Hall. [The best general work on the subject]

Briggs, DEG and Crowther, PR. 1990. Palaeobiology, a Synthesis. Chapters 1-4. Blackwell.

[Many short review sections]

Other readings to be introduced during course.

FIELDWORK

One day field class to Sheppey, Kent

MODULE ASSESSMENT

3 hour combined practical and theory examination (70%)

Written project (20%)

Oral presentation (10%)

LECTURER:

Dr Charlie Underwood

GLOBAL TECTONICS (15 credits) EASC041H6

MODULE AIM

To provide a global understanding of causes and consequences of present and past plate tectonic and associated geodynamic processes.

COGNITIVE SKILLS

Analysing, evaluating, and interpreting multidisciplinary data.
Development of evidence-based reasoning.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONSL SKILLS

Ability to work with information from a diverse range of sources.
Interpreting field observations and analytical data, use of graphs and tables.
Researching defined subject matter and preparing and writing reviews.

CONTENT AND ORGANISATION

The Internal structure of the Earth and its outer shell.
Elements of plate tectonic theory. What are plates? How do they move?
Models for direction, magnitudes and rates of plate motion.
Mineral composition and thermo-mechanical influences on global tectonics.
How do plates and plate margins evolve through time?
Subduction zone processes extension and rifting Global tectonics and sedimentary basin development.
Reconstructing plate collision histories and the development of large orogens such as the Himalaya-Tibet.

PREREQUISITES

Good passes in Structural Geology 1, Geophysics, and Igneous and Metamorphic Petrology are preferred.

RECOMMENDED READING

A significant component of the course material will come from research papers available online. The following textbooks also contain many useful chapters:

Fowler, C.M.R. The Solid Earth. Cambridge University Press ISBN 0-521-89397-0

Kearey, P. & Vine, F.J. *Global Tectonics*. Blackwell Scientific Publications. ISBN: 9780865429246.

Anderson, D.L New Theory of the Earth. Cambridge University Press. ISBN-13978-0-521-84959-3

MODULE ASSESSMENT

One 3 hour written paper (80%) Course work (20%).

LECTURER

Dr Andy Carter

INVERTEBRATE PALAEOLOGY (15 credits) EASC042H4

MAIN OBJECTIVES

The course will introduce the main common and important groups of invertebrate fossils. Concepts covered within each fossil group will include evolution, extinction, palaeobiology and functional morphology and geological uses. In addition the course will cover basic palaeontological principles, in particular classification, fossil preservation and fossil behaviour (in the form of trace fossils).

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

The principles of classification of organisms. The principles of fossil preservation. Morphology and palaeobiology of selected fossil invertebrate groups. The interpretation of behaviour and functional morphology of extinct organisms. The main geological applications of fossils

COGNITIVE SKILLS

Observational skills using hand specimens and photographs. Relating morphology of extinct organisms to biology and behaviour.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Recognition and identification of fossils in the field and laboratory. Use of fossils in various geological applications. Interpretation of trace fossils.

GENERAL/TRANSFERABLE SKILLS

Detailed observation. Interpretation based on incomplete data. Time and project management. Integration of theory

PREREQUISITES

None

CONTEXT AND ORGANISATION

Principles of classification and preservation. Palaeobiology and significance of sponges, corals, gastropods, bivalves, cephalopods, echinoderms, brachiopods, trilobites and graptolites. Trace fossils (fossil behaviour)

RECOMMENDED READING

To be introduced during module.

FIELDWORK

None / Combined field class with Earth History and Introduction to Geology

MODULE ASSESSMENT

3 hour combined practical and theory examination (80%), Practical file (20%)

LECTURER

Dr. Charlie Underwood

GEOLOGICAL HAZARDS (15 Credits) EASC044H6

MAIN OBJECTIVES

To convey an understanding of the origin and scale of natural geological hazards including earthquakes and landslips, volcanic hazards and floods. To show how the risk associated with geological hazards can be reduced, and to introduce the practical application and limitation of hazard monitoring and prediction.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Students will learn about earthquake, volcanic and tsunami hazards, and secondary hazards.

COGNITIVE SKILLS

Analysing, evaluating, and interpreting data; knowledge-based reasoning; information assimilation and recollection.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Hazard mapping; Appreciating the role of the geologist in hazard mitigation.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Graphical presentation of information in the form of a poster; Interpreting practical experimental data. Presenting work to a deadline.

PREREQUISITES

Good pass in *Introduction to Geology* and *Structural Geology* preferred, but will also be open to Birkbeck Geography, Environmental Science and UCL Environmental Geoscience students.

CONTENT AND ORGANISATION

Earthquake hazards including wave types, origin and location of earthquakes, magnitude scales, ground acceleration, effects of bedrock geology; long-term prediction, historical records, palaeoseismology, recurrence intervals, fault slip-rates, and fault behaviour models. Short-term prediction and mitigation. Landslides, classification and translation processes, monitoring and prediction. Volcanic hazards, types of eruptions, scale of eruption., Volcanic mudflows (lahars), their origin and effects. Methods of monitoring and predicting volcanic eruptions, levels of volcanic hazard alert. Mitigation of volcanic risks. Tsunamis, their origin, recurrence and monitoring and warning times. Occurrence in the geological record. Floods in the geological record including exceptional high magnitude floods. Discussion on the scale of recent and historic natural disasters.

RECOMMENDED READING

References will be made to journal publications.

McCall, G.J.H., Laming, D.J.C. & Scott, S.C. (eds.). 1992. *Geohazards*. Chapman & Hall. [A collection of papers on the assessment of geohazards, their prediction and mitigation].

Alexander, D. 1993. *Natural Disasters*. UCL Press.[A comprehensive text book]

Bell, F.G, 1999 *Geological Hazards: their assessment, avoidance and mitigation*. Spon Routledge.

Bryant, E.A. 1991. *Natural Hazards*. Cambridge University Press. [A general text].

ASSESSMENT

1 essay, 1 presentation, 2 practical reports, 1x 3-hour written exam.

LECTURERS Dr Charlie Bristow (Course Co-ordinator); Prof Hilary Downes; Dr Gerald Roberts.

CHEMISTRY AND POLLUTION OF WATER, SOIL AND AIR (15 credits) EASC045H6

OBJECTIVES

To provide a global understanding of the geochemistry of water, soil and air at the Earth, including the impact of changes brought about by human activity (pollution, climate change, etc.). To develop practical skills in solving geochemical problems. To develop a critical understanding of current and past research in low-temperature geochemistry. To develop the ability to extract the fundamental results in a research topic and to summarise those results in a review article and report.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understand the (i) underlying controls on water, soil and air chemistry and pollution, (ii) concepts of geochemical cycles and relationships between water, soil and air; (iii) anthropogenic influences on natural Earth surface geochemistry.

COGNITIVE SKILLS

Analyse, evaluate and interpret multidisciplinary data. Develop evidence-based reasoning. Put subject-specific information into a broader context.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Scientific literacy. Graphical skills. Ability to prepare a properly documented review article. Ability to access a variety of information sources. Ability to solve difficult chemical problems.

GENERAL/ TRANSFERABLE SKILLS

Mathematical, writing, and communication skills; self-motivation, time management and organisation; data analysis; ability to write concise reviews of technical subjects.

PREREQUISITES

Pass in A-level Geology or Introduction to Geology; Pass in Introduction to Geochemistry.

CONTENT AND ORGANISATION

Geochemical cycles, natural and polluted ocean, estuary, river and ground waters, chemical weathering, soil composition and chemistry, contaminated land, waste disposal, surface radioactivity, atmospheric chemistry and pollution.

RECOMMENDED READING

Selected readings from the journals *Applied Geochemistry*, *Geochimica et Cosmochimica Acta*, *Chemical Geology*, and others that are available through ScienceDirect.

MODULE ASSESSMENT

One 3-hour theory paper (70%). Assessed practical report (30%). Practicals will consist of exercises in handling and interpretation of geochemical data, for which a scientific calculator and access to the computer program Excel will be needed.

LECTURER Dr Karen Hudson-Edwards.

EARTH'S RESOURCES & RAW MATERIALS (15 credits)

EASC048H6

MAIN OBJECTIVES

This advanced course aims to cover the formation of economic deposits of sedimentary and igneous origin with examples from the petroleum and extractive industries. Key subjects we will cover include: the hydrocarbon play concept, hydrocarbon reservoir rocks, and the principles of ore geology.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Students will gain understanding in the formation of oil and gas, the formation of hydrocarbon reservoirs, and ore geology.

COGNITIVE SKILLS

Information assimilation and recollection.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Essential concepts in petroleum geology and core logging principles.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Graphic presentation of information on a poster; data collection and interpretation.

PREREQUISITES

The course is suitable for students on the BSc Geology and BSc Environmental Geology courses. Some knowledge, and an interest in sedimentology (*Principles of Sedimentology*) and igneous and metamorphic petrology (*Igneous and Metamorphic Petrology; after 2011: Igneous Petrology; Metamorphic Petrology*) is required.

CONTENT AND ORGANISATION

The course examines the formation and distribution of ores and sedimentary deposits of economic importance. The first part of the course will concentrate on hydrocarbon origin, migration and habitat. Lectures will outline petroleum source rock deposition, maturation and migration of petroleum and the character of petroleum reservoirs with examples from the North Sea. Other lecture topics are concerned with ores/economic deposits developed in sedimentary rocks, including coal, placer deposits, evaporites, residual deposits and ironstones. The final part of the course will focus on magmatic, hydrothermal and epithermal ore deposits. Lecture topics include the nature and morphology of the main types of ore deposit, classification of ore paragenesis, zoning and dating of ore deposits, orthomagmatic and hydrothermal deposits, building and industrial resources and mineralisation in space and time.

TEXTBOOKS

Glennie, K. (ed.) 1998. *Petroleum Geology of the North Sea*. Blackwell. 4th edition.
Craig, J.R., Vaughan, D.J. & Skinner, B.J. 1996. *Resources of the Earth*. Prentice Hall.
Evans, A.M. 1993. *Ore Geology and Industrial Minerals*. Blackwell.
Robb, L. (2005) *Introduction to ore-forming processes*. Blackwell.

ASSESSMENT

One 3-hour theory paper (70%); assessed poster presentation (15%) and assessed practicals (15%)

LECTURERS Dr Charlie Bristow; Dr Karen Hudson-Edwards

EARTH HISTORY (15 credits) EASC050H4

MAIN OBJECTIVES

To familiarise students with methods used to establish age relations and teach skills required to reconstruct geological history. To introduce some of the main themes of Earth history, particularly those from the geological evolution of the British Isles and adjacent areas.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Students will learn about the main periods of geological time and the major events that have punctuated Earth's history.

COGNITIVE SKILLS

Information assimilation and recollection.

SUBJECT-SPECIFIC PRACTICAL/ PROFESSIONAL SKILLS

Principles of stratigraphy and plate tectonics, and a familiarity with the geological timescale.

GENERAL/ TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Map interpretation; thinking in 3-D.

PREREQUISITES

Some knowledge of plate tectonics; module can be studied concurrently with *Introduction to Geology*.

CONTENTS

Principles of stratigraphy: lithostratigraphy, biostratigraphy, chronostratigraphy, conformity, disconformity and unconformities. Precambrian: formation of continents, Precambrian of the British Isles. Late Precambrian and Cambrian: the Cambrian "explosion". Closure of Iapetus Ocean and the Caledonian Orogeny. Devonian: "Old Red Sandstone Continent", post Caledonian Basins. Carboniferous: Basin fill sequence and palaeoenvironments. The Hercynian Orogeny: Devonian and Carboniferous of SW England. Permian and Triassic: post Hercynian basins. Jurassic and Cretaceous: opening of the Atlantic. Tertiary: Alpine Orogeny, volcanic province and London/ Hampshire basins. Quaternary: glaciations and Earth's glacial history.

RECOMMENDED READING

TOGHILL, P. 2000. *The Geology of Britain, an Introduction*. Swan Hill Press. [*As the name implies, this is an introductory text, easy to read and well illustrated*]

STANLEY, S.M. 1993. *Exploring Earth and Life through Time*. Freeman. [*Well illustrated account of sedimentary environments and past life*]

BACKGROUND READING

DOYLE, P., BENNET, M.R. & BAXTER, A.N. 1994. *The Key to Earth History*. An Introduction to Stratigraphy. Wiley. [*Excellent discussion of principles and methods*]

FIELDWORK

Joint with Introduction to Geology (one day).

MODULE EXAMINATION

One 2-hour combined theory and practical paper (80%); essay and coursework (20%).

LECTURERS Dr Charlie Bristow and Dr. Charlie Underwood

ASSESSED FIELD TECHNIQUES 4 x (15 credits). EASC053H5, EASC054H5 , EASC056H6, EASC055H6

MAIN OBJECTIVES

To give students experience of techniques involved in geological fieldwork.

ORGANISATION AND CONTENT

These modules are compulsory for BSc Geology and BSc Environmental Geology students. They are optional for students on the BSc Earth Science, Earth and Planetary Science, and Planetary Science with Astronomy. They consist of the work done by students in each of four Easter field classes of a normal degree course. Performance in the field (accuracy of observations and records) and quality of interpretation are assessed during and following each 10 day Easter field class by the field class leader in consultation with demonstrators (if any).

Techniques taught and assessed include geological mapping in a variety of terrains and at a variety of scales using base maps and aerial photographs; recording geological structures on maps and aerial photographs and on photographs of vertical sections; and the field description and logging of sedimentary, metamorphic and igneous rocks.

ASSESSMENT

One half module for each field class. After each field class the relevant notebooks/reports/maps etc are submitted for assessment. All assessed material from each of the four field classes must be retained by the student for presentation to the examiners in the student's final year.

RECOMMENDED READING

The Geological Society of London Handbook series:

Barnes:	Basic geological mapping.
McClay	The mapping of geological structures.
Tucker:	The field description of sedimentary rocks.
Thorpe & Brown:	The field description of igneous rocks.
Fry:	The field description of metamorphic rocks.

SPECIAL REQUIREMENTS

Hard hat, hand lens, field notebooks, compass, clinometer, pencils, mapping pens, tape measure, geological hammers. For some advanced field classes, a GPS will be useful.

LECTURERS

All members of staff are involved.

FOUNDATIONS OF MINERALOGY (15 credits) EASC057H4

MAIN OBJECTIVES

The course will introduce the major rock forming minerals, attempting to provide a basic understanding of their structural and chemical characteristics, and general indication of their origins. The optical properties of the minerals will be discussed, and practical classes will be run to illustrate the minerals in thin section and hand specimens.

KNOWLEDGE AND UNDERSTANDING

Understand basic concepts in mineralogy. Relate structure chemistry and properties of minerals.

COGNITIVE SKILLS

Interpreting information from hand specimens and thin sections, graphs. Developing reasoning based on evidence from hand specimens and thin sections.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Handling data from tables and graphs. Interpreting data, including optical and compositional effects.

GENERAL/TRANSFERABLE SKILLS

Interpreting data. Numeracy. Scientific literacy. Use of graphs and tables

CONTENT AND ORGANISATION

- Symmetry & Crystallography
- Optics
- Factors that determine mineral structures
- Mineral and Silicate Classification
- Olivine and Garnet Groups
- Al_2SiO_5 Polymorphs
- Pyroxene Group
- Amphibole Group
- Sheet Minerals
- Silica Polymorphs
- Feldspars, and other minerals

RECOMMENDED READING

- Introduction to Mineral Sciences by Putnis (CUP)
- Mineralogy for students by Battey & Pring (Longman)
- An Introduction to Rock Forming Minerals by Deer, Howie and Zussman (Longman)

MODULE ASSESSMENT

- 2 hour Theory examination (60%)
- Course work (40%) six pieces of assessed work.

LECTURER: Mr Steve Hiron

GEOLOGY OF THE SOLAR SYSTEM I (15 credits) SCES009H4

MAIN OBJECTIVES

To introduce students to the geological histories, and geological processes, of other planets, and to illustrate how this knowledge has led to our current understanding of the origin and evolution of the Solar System. The course is designed to give students taking the B.Sc. Degree in Planetary Science with Astronomy and the Certificate in Planetary Geology a basic introduction to planetary geology, with particular emphasis on the geology of the Moon.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic geology and geophysics of the other planets
Understanding of the various techniques used to acquire geological knowledge of other planets
Detailed understanding of our current knowledge of the origin and evolution of the Moon and its implications for understanding of other rocky planets.

COGNITIVE SKILLS

Understanding of scientific hypothesis development and testing
Ability to relate specific knowledge to a broader context

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Analysis and interpretation of planetary remote sensing data; Interpretation of images; creation of maps; interpretation of maps; Ability to transfer geological knowledge gained in the context of the Earth to wide range of different planetary environments.

Demonstrate knowledge of the specific aspects of planetary and lunar geology.

Demonstrate an understanding of how this knowledge has been arrived at, and the relationship between theories, hypotheses and observations in the planetary sciences.

GENERAL/TRANSFERABLE SKILLS

Familiarity with basic scientific concepts; Writing and presentation skills; Interpreting numerical and graphical data

PREREQUISITES

None (but 'Introduction to Geology' should be taken in parallel).

LECTURE CONTENT

Introduction to the Solar System, Techniques of Planetary Exploration, Planetary Interiors, Planetary Surfaces, Impact Cratering, Introduction to Lunar Geology, Lunar Rocks and Minerals, Lunar Dating and Stratigraphy, Lunar Geophysics, Origin and Geological Evolution of the Moon

PRACTICAL CONTENT

Construction of geological maps from orbital images of terrestrial planets
Study of meteorites and moon rocks (the latter in thin section using a petrographic microscope)
Visit to NASA's UK Regional Planetary Image Facility (at University College London), plus one other relevant visit to an external facility

RECOMMENDED READING

"Planetary Geology" by Claudio Vita-Finzi, Terra Press, 2005

MODULE EVALUATION

One 3-hour written examination (85%) and continuous assessment of practical and written work (15%)

LECTURER Dr Ian Crawford

GEOLOGY OF THE SOLAR SYSTEM II (15 credits) SCES01H5

MAIN OBJECTIVES

To introduce students to the geological histories, and geological processes, of other planets, and to illustrate how this knowledge has led to our current understanding of the origin and evolution of the Solar System.

The course is designed to give students taking the B.Sc. Degree in Planetary Science with Astronomy and the Certificate in Planetary Geology with a basic introduction to planetary geology, with particular emphasis on the Solar System beyond the Earth-Moon system.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge and understanding of the basic geology and geophysics of the other planets

Understanding of the various techniques used to acquire geological knowledge of other planets

Understanding of how a comparison of the geologies of the different planets informs our understanding of the origin and evolution of the Solar System as a whole

COGNITIVE SKILLS

Understanding of scientific hypothesis development and testing

Ability to relate specific knowledge to a broader context

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Analysis and interpretation of planetary remote sensing data; Interpretation of images; creation of maps; interpretation of maps; Ability to transfer geological knowledge gained in the context of the Earth to wide range of different planetary environments.

Demonstrate knowledge of the specific aspects of planetary geology outlined in the syllabus.

Demonstrate an understanding of how this knowledge has been arrived at, and the relationship between theories, hypotheses and observations in the planetary sciences.

GENERAL/TRANSFERABLE SKILLS

Familiarity with basic scientific concepts; Writing and presentation skills; Interpreting numerical and graphical data

PREREQUISITES

Introduction to Geology

Geology of the Solar System I

LECTURE CONTENT

Geology of Mars, Geology of Venus, Geology of Mercury, Geology of outer Solar System

Moons, Introduction to Planetary Atmospheres, Introduction to Asteroids, Meteorites and Comets

Origin of the Solar System

PRACTICAL CONTENT

Students will have the opportunity to examine hand specimens and petrographic thin-sections of various kinds of meteorite, and perform analyses of planetary remote-sensing data.

RECOMMENDED READING

“Planetary Geology” by Claudio Vita-Finzi, Terra Press, 2005

MODULE EVALUATION

One 3-hour written examination (85%) and continuous assessment of practical and written work (15%)

LECTURER Dr Ian Crawford

VOLCANISM IN THE SOLAR SYSTEM (15 credits) EASC059H6

OBJECTIVES

This module aims to: 1) introduce students to the nature of volcanism on the Earth and other planets; 2) expand their understanding of the processes that drive volcanism; 3) explain the differences in volcanic activity on different bodies in the Solar System ; 4) show how volcanic activity is related to the chemical and physical properties of magmas and the nature of the planetary body. A mixture of terrestrial and planetary material will be presented.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Understanding of the diversity of magmas that form volcanoes on the terrestrial planets and icy satellites; understanding volcanic processes and products.

COGNITIVE SKILLS

Ability to synthesise information from different sources. Hypothesis testing. Critical assessment of results.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Ability to distinguish and classify volcanic structures and products using maps, hand-specimens and thin-sections.

GENERAL/TRANSFERABLE SKILLS

Poster presentation skills (use of PC, software packages, scanner, web, printer) Numeracy, scientific literacy, computer literacy

PREREQUISITES

Passes in Introduction to Geology, Foundations of Mineralogy and Igneous and Metamorphic Petrology (after 2011, a pass in Igneous Petrology).

CONTENT AND ORGANISATION

The module will consist of 11 lectures and practicals on volcanic activity on Earth (6 lectures), the Moon, Mars, Venus , Io and the icy moons. Practical material will include hand-specimens and thin-sections of volcanic rocks, together with maps and digital images of volcanoes, analogue modelling of lava flows, and sieving of an unconsolidated pyroclastic deposit.

RECOMMENDED READING

“Volcanoes” by P Francis and C Oppenheimer (2nd edition), OUP. 2004

MODULE EXAMINATIONS

The course will be assessed on a series of practical assignments (15%), a poster on a specified topic (10%) and a 3 hour written examination (75%).

LECTURER

Professor Hilary Downes

INTRODUCTION TO ASTROBIOLOGY (15 credits) EASC064H6

MAIN OBJECTIVES

The course is designed to provide a basic introduction to the exciting new field of astrobiology the study of the astronomical and planetary context within which life on Earth has evolved, and the implications for the prevalence of life elsewhere in the Universe. It will therefore aim to:

- (1) Introduce students to the astronomical background of the origin of life, including the origin of the necessary chemical elements and the origin and evolution of the Solar System;
- (2) Introduce the concept of pre-biological chemical evolution, and familiarize students with the key theories and experimental results in this area;
- (3) Provide students with an overview of the history of life on Earth, and its relevance for life elsewhere, with special reference to extremophilic life;
- (4) Outline the prospects for life elsewhere in the Universe, both in our own Solar System and on the newly discovered planets around other stars;
- (5) Introduce students to the scientific and philosophical issues concerning the possibility of extraterrestrial intelligence.

COGNITIVE SKILLS

Understanding of scientific hypothesis development and testing. Ability to relate specific knowledge to a broader context.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Ability to integrate a wide range of knowledge, from several different scientific disciplines.

GENERAL/TRANSFERABLE SKILLS

Familiarity with basic scientific concepts. Writing and presentation skills. Interpreting numerical and graphical data.

PREREQUISITES

A Pass in Geology of the Solar System

LECTURE CONTENT

Origin and distribution of biologically important chemical elements. Conditions in the early solar system. Earliest evidence for life on Earth. Some biological basics. Pre-biological chemical evolution. Astrobiological implications of the history of life on Earth. Requirements for life. Prospects for life on Mars. Life elsewhere in the Solar System. Planets around other stars. The search for extraterrestrial intelligence.

PRACTICAL CONTENT

Study of meteorites and moon rocks (the latter in thin section using a petrographic microscope)

COURSEWORK

Two c.1000 word essays on astrobiological topics

RECOMMENDED READING

The Search for Life on Other Planets, by Bruce Jakosky, Cambridge University Press, 1998.
Life in the Solar System and Beyond, by Barrie W. Jones, Springer Praxis, 2004

MODULE EVALUATION

One 3-hour written examination (75%) and continuous assessment of practical and written work (25%)

LECTURER Dr Ian Crawford

TECTONIC GEOMORPHOLOGY (15 credits) EASC066H6

MAIN OBJECTIVES

Develop understanding of interactions between the Earth's geological, physical and chemical processes and landscape evolution. To show how mountains grow and are destroyed. Understand how topography influences Earth's climate and where to look in the geological record for evidence of landscape-climate interactions.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Learn how landscapes form and evolve. Understand concepts of feedback systems between geological processes and climate. Understand the processes and controls that govern landscape evolution.

COGNITIVE SKILLS

Analysing, evaluating, and interpreting data. Putting subject-specific information into a broader context. Development of evidence-based reasoning

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Handling data from tables and graphs. Synthesis of information from a range of sources. Ability to think in 3 dimensions.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Comprehension of scientific data and papers . Interpreting data. Use of graphs and tables. Written presentation skills. Oral presentation skills.

PREREQUISITES

A pass in Introduction to Geology

CONTENT AND ORGANISATION

Introduction to landscape evolution. The role of denudation, uplift and isostasy. Reference frames and the use of geomorphic and geodetic markers. Applications of relative and absolute dating methods to landscape evolution studies. The nature of climate-tectonic interactions. Mountain belt evolution. Passive margin evolution. Short and long term deformation and landscape response. Development and application of numerical and analog models.

RECOMMENDED READING

Allen, P.A., 1997, Earth Surface Processes. Blackwell Science, pp404

Burbank, D., & Anderson, R.S., 2001, Tectonic Geomorphology. Blackwell Science pp274.

Keller, E.A., & Pinter, N., 2002. Active Tectonics (earthquakes, uplift and landscape). Prentice Hall, New Jersey. pp362

Summerfield, M.A., 2000 Geomorphology and global tectonics, Chichester : Wiley

MODULE EXAMINATION

- 3 hour Theory examination (70%)
- Course work (30%)

LECTURER

Dr Andy Carter

PROJECT BSc EARTH SCIENCES (30 credits) EASC070S6

MAIN OBJECTIVES

To give students experience of independent work on a topic of interest within the Earth Sciences and the preparation of a scientific report. Normally taken by students who are unable to undertake a map and thesis, or for whom a project would be more appropriate. Each student will be allocated a supervisor who will be responsible for advice on all aspects of the module.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT.

Knowledge and understanding of the basic tenets of the particular area of Earth Sciences for the project. Hypothesis development and testing skills through analysis of the data obtained for their project, theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations during the project work.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Collect and analyse data relevant to the area of geology related to their project using a variety of research techniques. The student will be able to critically assess the quality of the scientific method, data, results, conclusions and implications of relevant studies.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Scientific writing, comprehension of scientific data and papers; manipulation of data using relevant software/research techniques; independent study; IT skills and confidence in their abilities to follow a problem through to its end.

CONTENT AND ORGANISATION

Students will be expected to choose a topic in consultation with a supervisor, who will also give instructions regarding field techniques and any laboratory work that is required for the project. Most of the work will be done independently. If field work/mapping is involved, two copies of 1:10 000 maps of the field area will be supplied by the School of Earth Sciences. If thin sections or laboratory analyses are necessary, these will be done in the School after consultation with the supervisor. Students may be required to pay for the cost of other materials used in the project. Time spent on the project will normally be equivalent to that expected for the map and thesis. The project report will normally be up to 15,000 words.

RECOMMENDED READING

Students are expected to be familiar with the literature relating to their topic. A handbook with guidelines about undertaking projects and writing reports is available from the department.

MODULE EXAMINATION

The quality of the project and report is assessed by the examiners, supplemented by an oral examination by the two external examiners.

TIMETABLE

Students will be allocated a project and a supervisor normally early in the second year and should begin their work on the project in the summer vacation, making their own arrangements.

LECTURER: Steve Hirons or Dr Gerald Roberts

PROJECT BSc GEOLOGY (30 credits) EASC071S6

MAIN OBJECTIVES

To give students experience of independent work on a topic of geological interest, normally including at least 18 days of field mapping and 6 days of some other type of field work (e.g., sedimentary logging) and the preparation of a scientific report. Each student will be allocated a supervisor who will be responsible for advice on all aspects of the module.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT.

Knowledge and understanding of the basic tenets of the particular area of geology for the project. Hypothesis development and testing skills through analysis of the data obtained for their project, theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations during the project work.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Collect and analyse data relevant to the area of geology related to their project using a variety of research techniques. The student will be able to critically assess the quality of the scientific method, data, results, conclusions and implications of relevant studies.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Scientific writing, comprehension of scientific data and papers; manipulation of data using relevant software/research techniques; independent study; IT skills and confidence in their abilities to follow a problem through to its end.

CONTENT AND ORGANISATION

Students will be expected to choose a topic in consultation with a supervisor, who will also give instructions regarding field techniques and any laboratory work that is required for the project. Most of the work will be done independently. If field work/mapping is involved, two copies of 1:10 000 maps of the field area will be supplied by the School of Earth Sciences. If thin sections or laboratory analyses are necessary, these will be done in the School after consultation with the supervisor. Students may be required to pay for the cost of other materials used in the project. Time spent on the project will normally be equivalent to that expected for the map and thesis. The project report will normally be up to 15,000 words.

RECOMMENDED READING

Students are expected to be familiar with the literature relating to their topic. A handbook with guidelines about undertaking projects and writing reports is available from the department.

MODULE EXAMINATION

The quality of the project and report is assessed by the examiners, supplemented by an oral examination by the two external examiners.

TIMETABLE

Students will be allocated a project and a supervisor normally early in the second year and should begin their work on the project in the summer vacation, making their own arrangements.

LECTURER: Steve Hirons or Dr Gerald Roberts

PROJECT FOR BSc PLANETARY SCIENCE WITH ASTRONOMY (30 credits) EASC072S6

MAIN OBJECTIVES

To give students experience of independent work on a topic in Planetary Sciences and the preparation of a scientific report. Each student will be allocated a supervisor who will be responsible for advice on all aspects of the course.

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT.

Knowledge and understanding of the basic tenets of the particular subject for the project. Hypothesis development and testing skills through analysis of the data obtained for their project, theoretical understanding of relevant concepts, critical assessment of results and outcomes and experience of real situations during the project work.

SUBJECT SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

Collect and analyse data relevant to subject related to their project using a variety of research techniques. The student will be able to critically assess the quality of the scientific method, data, results, conclusions and implications of relevant studies.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Scientific writing, comprehension of scientific data and papers; manipulation of data using relevant software/research techniques; independent study; IT skills and confidence in their abilities to follow a problem through to its end.

CONTENT AND ORGANISATION

Students will be expected to choose a topic in consultation with a supervisor, who will also give instructions regarding techniques and any laboratory work that is required for the project. Most of the work will be done independently. If thin sections or laboratory analyses are necessary, these will be done in the School after consultation with the supervisor. Students may be required to pay for the cost of other materials used in the project. Time spent on the project will normally be equivalent to that expected for the map and thesis. The project report will normally be up to 10,000 words.

RECOMMENDED READING

Students are expected to be familiar with the literature relating to their topic. A handbook with guidelines about undertaking projects and writing reports is available from the department.

MODULE EXAMINATION

The quality of the project and report is assessed by the examiners, supplemented by an oral examination by the two external examiners. Students are also required to make by a 20 minute Powerpoint presentation (20%) on their project.

TIMETABLE

Students will be allocated a project and a supervisor normally early in the second year and should begin their work on the project in the summer vacation, making their own arrangements.

LECTURER: Dr Ian Crawford; Professor Hilary Downes

ADVANCED TOPICS IN PLANETARY SCIENCE (15 credits) EASC072H6

MAIN OBJECTIVES

The module is designed to give students taking the B.Sc. Degree in Earth and Planetary Science an opportunity to learn about ‘cutting edge’ developments in contemporary planetary science through directed reading of the recent research literature. After completing the course, students will have a good understanding of the present state of planetary science, and where current research activities are focused. In addition, through completion of a 3000 word report, and associated presentation, on a contemporary planetary science topic students will gain experience in assimilating information from the literature and presenting it in an intelligible manner to non-specialists.

PREREQUISITES

Geology of the Solar System I and II; Introduction to Astrobiology (EASC064U)

KNOWLEDGE AND UNDERSTANDING IN THE CONTEXT OF THE SUBJECT

Knowledge of the focus of contemporary research activities in planetary science, in particular as gained by recent space missions and advances in analytical and computational techniques.

COGNITIVE SKILLS

The student will acquire knowledge and understanding of processes relevant to the astronomical, geological and geophysical evolution of planetary bodies and an ability to relate specific knowledge gained in particular research fields to a broader context of human knowledge.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

This is not a primarily practical module, although students will gain experience in online literature searching and presentation skills.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

The student will gain skills such as writing, comprehension of scientific concepts, independent study and experience in presenting knowledge gained to their peers and other interested individuals.

MODULE EXAMINATION

Written Examination (50%) One 3 hour written paper

Brief summaries (20%) Summaries of key points made in each of the assigned papers (no more than 500 words each)

Written mini-project Report (20%) 3000 words

Presentation (10%) 15 minute PowerPoint presentation

LECTURER

Dr Ian Crawford

FOUNDATIONS OF ASTRONOMY (15 credits) SCES001H4

MAIN OBJECTIVES

The course is designed to provide a basic introduction to the science of astronomy.

COGNITIVE SKILLS

Understanding of scientific hypothesis development and testing. Ability to relate specific knowledge to a broader context.

SUBJECT-SPECIFIC PRACTICAL/PROFESSIONAL SKILLS

To understand and synthesise original research findings. To think quantitatively. To discuss the relationship between theory, empirical data and models.

GENERAL/TRANSFERABLE SKILLS

Familiarity with basic scientific concepts. Writing and presentation skills. Interpreting numerical and graphical data.

PREREQUISITES

None

LECTURE CONTENT

Astronomical nomenclature (constellations; star names and catalogues; stellar magnitudes; non-stellar objects; etc); Astronomical coordinate systems; Astronomical distance scale; Techniques of astronomical observation (electromagnetic spectrum; telescopes; spectroscopy); Stars (classification; energy sources; Hertzsprung-Russell Diagram; stellar evolution; nucleosynthesis); Interstellar medium; Structure of the Milky Way Galaxy; Extragalactic astronomy; Cosmology

PRACTICAL CONTENT

There will be one visit to a professional observatory arranged during the course. In addition, practical observations will be conducted with the Department's own telescope in the UCL Front Quad weather permitting.

COURSEWORK

There will be two pieces of assessed coursework, consisting either of two problem papers or one problem paper and one 1200 word essay.

RECOMMENDED READING

Introduction to Astronomy and Cosmology by Ian Morison (John Wiley, 2008).

MODULE EVALUATION

One 3-hour written examination (75%) and continuous assessment of practical and written work (25%)

LECTURER Dr Ian Crawford

FORENSIC GEOLOGY EASC074H6 (15 credits) DISTANCE LEARNING ONLY

PREREQUISITES

You can study this module if you are enrolled on the following programmes: Certificate in Forensic Geology; BSc Environmental Geology (option only); BSc Earth Science (option only)
A pass in Introduction to Geology, Introduction to Geochemistry and Invertebrate Palaeontology .

MAIN AIMS

The module provides a basic introduction forensic geology –the application of the principles of geological sciences to the identification and evaluation of geological materials that may relate to forensic investigation. The module will: Provide students with an overview of the history and development of forensic geology; Review the substantiation of compliance with laws, procedures, standards and ethics related to professional forensic geological investigation; Introduce techniques used to carry out forensic geological investigation and illustrate with examples, the wide variety of geological materials associated with crime, and the identification and classification of these.

MODULE OBJECTIVES

Knowledge and understanding in the context of the subject.

Understanding the process and systems related to forensic geology.

COGNITIVE SKILLS

Interpreting information derived from thin-section and hand specimen analysis: developing reasoning based on evidence from physical and chemical properties of geological material.

GENERAL/TRANSFERABLE SKILLS (INCLUDING KEY SKILLS)

Interpreting numerical and chemical data; writing scientific descriptions of rock, mineral, soil, fossil and pollen samples; writing and presentation skills; use of graphs and diagrams.

MODULE CONTENTS

The course examines the background to, and physical and chemical properties of geological materials used in, forensic science. Lectures will focus on the History and development of forensic geology, compliance with laws, procedures, standards and ethics, rocks, sand, coal, fossils, pollen, spore, paints and building materials in forensic investigations, and geophysical methods of forensic investigation.

READING

Murray, R.C. (2004) Evidence from Earth. Forensic Geology and Criminal Investigation. Mountain Press Publishing Company.

Pye, K. and Croft, D.J (2004) Forensic Geoscience:Principles, Techniques and applications. Geological Society Special Publication 232.

Research papers relating to the course will be found in the following journals; Forensic Science International; Journal of Raman Spectroscopy; Journal of Forensic Science.

ASSESSMENT

70% one three-hour theory paper; 30% assessed practical

Practical will consist of exercises in handling and interpreting geological data and materials related to forensic cases.

LECTURER Dr Karen Hudson Edwards

EXAMINATIONS

INTRODUCTION

The following describes how degree courses in Geology, Environmental Geology, Earth Sciences, Earth and Planetary Sciences, and Planetary Sciences with Astronomy are examined, and explains the Scheme for the Award of Honours for BSc degrees at Birkbeck College.

The examination of degree courses are the responsibility of the College Sub-Board of Examiners in Geology. The Sub-Board includes as Internal (College) members who are the academic staff. There are also two Visiting Examiners, of whom one is from another College of the University of London (the Intercollegiate Examiner) and the other is from another University. The Geology Sub-Board reports to the College Board of Examiners for the BSc Degree, and the Visiting Examiners also report independently to the College and the University.

Exams are normally held in the Summer term in May and early June during the day (morning or afternoon). The exam timetable is set by College Exams office and may be held in College or in the Department.

Please ensure you have made appropriate arrangements for taking leave during the examination period.

STRUCTURE OF THE BSc DEGREES

The BSc courses are modular in structure, with the subject matter organised into modules or half-modules. Students take 12 full modules over four years of which 5 must be taken at an Advanced level, and each module or half-module is examined separately. The College Boards and Sub-Boards normally require all finalist candidates to undergo an oral examination (“viva”) as described below.

There are currently two systems in place for the award of Honours Degrees. The older scheme applies to students who registered before 2008, and is referred to as the “non-CAS” or “pre-CAS” scheme. The “Common Awards Scheme” (CAS) applies to all students who registered after 2008 and to any student who registered before 2008 who has taken a break in their studies. The main differences between the two schemes are: (1) CAS students take 12 modules, whereas pre-CAS students were required to take 11 modules (although in practice many took 12); (2) the modules taken by CAS students are weighted as shown below (see “Scheme for the Award of Honours”), whereas the modules of pre-CAS students were weighted slightly differently.

STRUCTURE OF MODULE EXAMINATIONS

The detailed structure of the examination varies from one module to another. With the exception of the field- or project-based module, there is normally an unseen written Theory paper and there is often also a Practical paper (copies of past papers can be downloaded from the College Library). For some modules there is also assessment of course-work (e.g. essays, project report, laboratory notebooks). Information about module examination elements and their relative weighting (% of total marks) will be given to students during the course.

SETTING EXAMINATIONS

For each module the examination is set by the teacher(s) with responsibility for the module. Each

question and the balance of the examination are carefully vetted by the Sub-Board of Examiners and independently by the Visiting Examiners.

MARKING EXAMINATIONS

Marking of all examination scripts is carried out by two Internal examiners who act independently and then agree marks. The scale of marks used is the College Common Scale, which specifies the following categories:

Honours Class 1	70% and above
Honours Class 2i	60%-69%
Honours Class 2ii	50%-59%
Honours Class 3	40%-49%
Fail	25%-39%
Bad Fail	24% and below.

A description of what is required for the various ranges of marks is shown on a separate page.

The marked scripts are then assessed by one of the Visiting Examiners, who ensures that the Internal Examiners have acted fairly and that the standards are comparable with those elsewhere in the British University system. The marks for each element of the module examination (Theory paper, Practical paper, course-work as appropriate) are then combined to produce an overall percentage mark for the module.

SCHEME FOR THE AWARD OF HONOURS

This Scheme is indicative only and is subject to alteration from time to time. It is published for the general guidance of students and is not the sole determinant of the classification of a degree.

Preliminary assessment of Honours for the BSc Degrees will be determined from the mean mark calculated using the modules' values and the following weighting factors:

- Weight 0: modules normally taken in the first year and equivalent courses in ancillary subjects.
- Weight 1: modules normally taken in the second year and equivalent modules in ancillary subjects.
- Weight 2: All other Geology modules, normally taken in the third or fourth years, advanced modules in ancillary subjects and advanced courses in other Colleges.

VIVAS

All students have a 30 minute examination (Viva) with the external examiners when they graduate. Vivas are arranged after the examinations. The purpose of the Viva is to determine the student's understanding of the subject. The external examiners usually ask questions about the student's map and thesis or project, together with some broader questions.

The final results for each candidate are determined not only on the basis of the grades or marks awarded to the candidate in the individual elements of the examination, but also on the

assessment by the examiners, taking account of advice of Visiting Examiners, of the overall performance of the candidate. Various factors may be taken into account in arriving at the final result, such as the distribution of marks awarded to the candidate over the various elements, the strength or weakness shown in relation to that in other elements, any special difficulties known to have been experienced by the candidate at the time of the examination (e.g. illness). Distance Learners can take this oral examination by Skype if necessary.

SUB-BOARD OF EXAMINERS IN GEOLOGY

GUIDELINES FOR AWARDING CLASSIFIED MARKS

First class (80-100)	Outstanding answer, at a level of sophistication far beyond that of most candidates. Evidence of wide reading, synthesis, criticism, quotations of recent literature, own opinion. Exceptionally clear, well structured logical answer.
First class (70-79)	Excellent answer, sophisticated and extremely clear. Well structured, well written and logical, with clear evidence of background reading.
Upper Second (60-69)	Competent and almost complete answer, well presented, accurate recall, clear understanding of material. May contain some evidence of background reading.
Lower Second (50-59)	Clear, reasonably complete answer, good recall of material. Presentation and organisation not as good as that of an Upper Second, and answer is not as comprehensive.
Third (40-49)	An incomplete answer, partial recall. Some evidence of understanding. May suffer from poor organisation. May contain irrelevancies and omissions.
Fail (25-39)	Inaccurate answer, much may be irrelevant. Little evidence of understanding.
Bad Fail (0-24)	Totally inaccurate or irrelevant answer; may be very short or incoherent; no evidence of understanding. Individual correct facts may attract marks.

Plagiarism Statement

What is plagiarism?

Plagiarism, the act of taking somebody else's work and presenting it as your own, is an act of academic dishonesty, and Birkbeck takes it very seriously.

Examples of plagiarism include (but are not restricted to):

- copying the whole or substantial parts of a paper from a source text (e.g. a web site, journal article, book or encyclopaedia), without proper acknowledgement
- paraphrasing another's piece of work closely, with minor changes but with the essential meaning, form and/or progression of ideas maintained
- piecing together sections of the work of others into a new whole
- procuring a paper from a company or essay bank (including Internet sites)
- submitting another student's work, with or without that student's knowledge
- submitting a paper written by someone else (e.g. a peer or relative) and passing it off as one's own
- representing a piece of joint or group work as one's own.

If you knowingly assist another student to plagiarise (for example, by willingly giving them your own work to copy from), you are committing an examination offence.

Academic declaration form

When submitting coursework (e.g. essay, coursework or dissertation), **you will need to sign an academic declaration form**, stating that you have read the sections of plagiarism in your Departmental Handbook and confirming that the work is your own, with the work of others fully acknowledged.

What happens if plagiarism is suspected?

Where an examiner (of examinations and other written coursework) suspects plagiarism, s/he has a responsibility to report this to the College. Where there is evidence of plagiarism, the relevant procedures in the regulations will be followed and the person responsible will be contacted accordingly.

Further information and regulations

<http://www.bbk.ac.uk/reg/regs/plagiarism>

Disability Statement for the Dept. of Earth and Planetary Sciences

At Birkbeck there are students with a wide range of disabilities including dyslexia, visual or hearing impairments, mobility difficulties, mental health needs, HIV, M.E., respiratory conditions etc. Many of them have benefited from the advice and support provided by the College's disability service.

The Disability Office

The College has a Disability Office located on the main corridor of the Malet Street building. We have a Disability Service Manager, Mark Pimm, and a Disability Advisor, Steve Short.

Mark is your first point of referral for disability enquiries at the College whilst Steve is for dyslexia. They can provide advice and support on travel and parking, physical access, the Disabled Students Allowance, special equipment, personal support, examination arrangements etc. If you have a disability or dyslexia, we recommend you make an appointment to see them as soon as possible after commencing your course. Appointments lasting one hour are available from 12 noon to 5 pm Monday to Friday and are booked by Steve (details below).

At your first appointment at the Disability Office they will ask you to complete a Confidentiality Consent Form. This allows you to state who in the College can be informed of your disability. Remember, if you wish, we do not need to inform people of the exact nature of your disability, just your disability related needs. They will also complete an Individual Student Support Agreement form, confirming your support requirements and send this to Department so they are informed of your needs.

The Disabled Students Allowance

Students with disabilities or dyslexia on undergraduate or most postgraduate courses who meet the eligibility criteria regarding residency are eligible to apply for the Disabled Students Allowance (DSA). This can meet the cost of special equipment e.g. computers, cassette recorders, etc, non-medical personal help, e.g. note-takers, interpreters, readers, etc, book and photocopying allowances and additional travel costs. The Disability Service Manager can assist you in applying to your Local Education Authority (LEA) for this.

The Personal Assistance Scheme

Some students need a personal assistant to provide support on their course, for example a note-taker, sign language interpreter, reader, personal assistant, disability mentor or dyslexia support tutor. Birkbeck has a Personal Assistant's Scheme to assist you with recruiting, training and paying your personal assistant. Please contact Steve Short for information on this scheme.

Support in your Department

The provision which can be made for students with disabilities by Departments is set out in the Procedures for Schools for Compliance with the Disability Discrimination Act. This is available from the Disability Office and the Disability website (see below). Your Department will receive a copy of your Individual Student Support Agreement from the Disability Office. This will make specific recommendations about the support you should receive from the School.

Whilst we anticipate that this support will be provided by the Programme Director, tutors and Department Administrator, the Department of Earth and Planetary Sciences also has a Disability Liaison Officer, Dr Andy Beard. If you experience any difficulties or require additional support from the School then they may also be able to assist you. They may be contacted on 020 7679 2387 or at: a.beard@ucl.ac.uk.

Support in Central Computing Services and Library Services

There is a comprehensive range of specialist equipment for students with disabilities in Central Computing Services. This includes screen reading and character enhancing software for students with visual impairments, specialist scanning software, large monitors, dyslexia software, ergonomic mice and keyboards, specialist orthopaedic chairs etc. For advice and assistance please contact the Disability IT Officer. There is also some specialist equipment in the Malet Street Library, including a CCTV and students with disabilities may benefit from using the Library's LAMP service for postal deliveries.

Specific Learning Difficulties (Dyslexia)

Mature students who experienced problems at school are often unaware that these problems may result from their being dyslexic. Whilst dyslexia cannot be cured, you can learn strategies, which make studying significantly easier. If you think you may be dyslexic you should contact Steve Short, he can screen you and where appropriate refer you to an Educational Psychologist for a dyslexia assessment. These assessments cost £300. Some students can receive assistance in meeting this cost from their employer. In exceptional cases students may receive assistance from the Access Fund.

Examinations

Students with disabilities and dyslexia may be eligible for special arrangements for examinations e.g. extra time, use of a word processor, amanuensis, enlarged examination papers etc. In order to receive special arrangements students must provide Medical Evidence of their disability (or an Educational Psychologists Report if you are dyslexic). The closing date for making special examination arrangements is the 15th March and beyond this date consideration will only be given to emergency cases.

The Disability Handbook

The Disability Handbook provides detailed information on the support available from the College. Copies are available from all main reception areas, the Disability Office and from the College disability web site at: <http://www.bbk.ac.uk/disability/policies>

For further information or to make an appointment to see Mark or Steve, please call Steve Short (Disability Advisor) on 020 7631 6336 or email disability@bbk.ac.uk.

Contacts in the Department of Earth and Planetary Sciences

Please be aware that we are moving during the academic year and our telephone numbers may change.

Academic and Academic-Related

Dr Andy Beard	020 7679 2387	a.beard@ucl.ac.uk
Dr Charlie Bristow	020 7679 7710	c.bristow@ucl.ac.uk
Dr Andy Carter	020 7679 2418	a.carter@ucl.ac.uk
Dr Ian Crawford	020 7679 3431	i.crawford@ucl.ac.uk
Professor Hilary Downes	020 7679 7712	h.downes@ucl.ac.uk
Mr Steve Hirons	020 7679 2385	s.hirons@ucl.ac.uk
Dr Philip Hopley	020 7679 3406	p.hopley@ucl.ac.uk
Dr Karen Hudson-Edwards	020 7679 7715	k.hudson-edwards@bbk.ac.uk
Dr Gerald Roberts	020 7679 7713	gerald.roberts@ucl.ac.uk
Dr Vincent Tong	0207 679 2386	c.tong@bbk.ac.uk
Dr Charlie Underwood	020 7679 2658	c.underwood@bbk.ac.uk
Dr Pieter Vermeesch	020 7679 3406	p.vermeesch@bbk.ac.uk

Technical and Clerical

Maz Iqbal	020 7679 2368	m.iqbal@ucl.ac.uk
Hank Sombroek	020 7679 7336	h.sombroek@bbk.ac.uk
Stephen Jenkins	0207 679 7333	s.jenkins@bbk.ac.uk
Peter Gaunt		p.gaunt@bbk.ac.uk

Postal Address

Birkbeck University of London
Department of Earth and Planetary Sciences
Malet Street
London
WC1E 7HX

Website

www.bbk.ac.uk/es

Fax

020 7679 2867