

GL1101 The Rock Cycle - Our Dynamic Earth

Academic Year:	2018/9	Student Workload (hours)	
Module Level:	Year 1	Lectures	14
Scheme:	UG	Seminars	
Department:	Geology	Practical Classes & Workshops	103
Credits:	30	Tutorials	
		Fieldwork	
		Project Supervision	8
		Guided Independent Study	175
		Demonstration	
		Supervised time in studio/workshop	
		Work Based Learning	
		Placement	
		Year Abroad	
		Total Module Hours	300

Period:	Academic Year
Occurrence:	E
Coordinator:	Marc Reichow
Mark Scheme:	UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Tests	40				
002	Coursework Group Poster	20				
003	Independent Project Work	40				

Intended Learning Outcomes

By the end of this module successful students will be able to:

- Outline the formation of the solar system, origin of elements and evolution of our planet Earth over time
- Define and link the main processes responsible for the formation and transformation of the three principle rock types and understand the holistic relationship and interplay between Earth's various layers
- Discuss rocks and minerals in terms of physical and chemical principles. Describe and identify common igneous, metamorphic and sedimentary rocks in hand specimen and thin section, and produce illustrated, technical descriptions and interpretations
- Use simple mathematical equations to calculate physical conditions in the Earth, mineral properties and interpret igneous, metamorphic and sedimentary processes
- Work effectively as part of a small team

Teaching and Learning Methods

Lectures, workshops and practical classes

Assessment Methods

Tests, project and poster

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL1102 Micro to Macro: from rock properties to plate tectonics

Academic Year: 2018/9
Module Level: Year 1
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	18
Seminars	
Practical Classes & Workshops	45
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	87
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Timothy Pritchard
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical	20				
002	Multiple Choice Questions	10				
003	Examination	70		1.5		

Intended Learning Outcomes

By the end of this module, students should be able to:

- Re-arrange and solve equations describing the physical properties of the Earth's Interior
- Plot and use graphs to determine the rate of change of physical properties
- Manipulate data using appropriate computer software
- Have knowledge of, and describe, theories, concepts and principles associated with plate tectonics and the structural features of the Earth's Interior
- Present the analysis of geophysical data within a report, using professionally produced diagrams and writing.
- Consider and discuss uncertainties relating to geophysical data and methods

Teaching and Learning Methods

Lectures, workshops and practical classes

Assessment Methods

Exam, MCQ, Practical

Pre-Requisites

Co-Requisites

Excluded Combinations

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Guided Independent Study: Indicative Activities

GL1103 Palaeobiology and the Stratigraphic Record: evolution and diversity through time

Academic Year: 2018/9
Module Level: Year 1
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	18
Seminars	
Practical Classes & Workshops	36
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	96
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Tom Fletcher
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (theory and practical)	100		2		

Intended Learning Outcomes

By the end of this module, typical students should be able to outline: the basic principles of evolution by natural selection; the pattern of evolutionary origins and relationships between the major groups of organisms; key evolutionary events and the broad pattern of biodiversity change through geological time; the primary means by which stratigraphic successions are constructed and how such methods were developed; the geological development of the British Isles. They should be able to distinguish between the important groups of fossil organisms, and identify and outline their main morphological features. Students should be able to explain the scientific utility of fossils, and how fossil and extant organisms are classified.

Teaching and Learning Methods

Lectures, practical classes, demonstrations and work sheets

Assessment Methods

Examination

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL1104 Natural Resources and the Environment

Academic Year: 2018/9
Module Level: Year 1
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	9
Seminars	
Practical Classes & Workshops	45
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	96
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: David Holwell
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam	80		1.5		
002	Group Practical	20				

Intended Learning Outcomes

On completion of this module, successful students will be able to:

Demonstrate knowledge and understanding of a range of topics typically including:

- Define the concept of what a resource is
- Outline the major ore forming processes and deposit types
- Discuss the societal impact of natural resource exploitation
- Describe how fossil fuels are formed
- Interpret seismic sections in relation to oil and gas exploration
- Discuss the main alternative energy resources to fossil fuels
- Outline the major processes and chemical reactions in hydrogeology
- Calculate some of the major aquifer properties

Identify common ore minerals in hand specimen
 Work effectively as part of a small team

Teaching and Learning Methods

Lectures, practical classes, small group work, independent research

Assessment Methods

Exam, Group Practical, Formative

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL1105 Geological Maps and Structures

Academic Year: 2018/9
Module Level: Year 1
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	51
Tutorials	
Fieldwork	3
Project Supervision	
Guided Independent Study	96
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Sarah Lee
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
002	Examination	100		1.5		

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Outline and understand basic stratigraphic relationships
- Define the major classes of geological structure and be able to recognise and classify these on geological maps
- Extrapolate 3D geology from a 2D map
- Construct geological cross-sections
- Define the geological history of a map
- Use computer software to design your own 3D geological block models
- Locate yourself on a map and understand how to use compass bearings and pascings in order to mark features on a base map

Teaching and Learning Methods

Workshops and field exercise

Assessment Methods

Exam, Practical, Formative (within practicals and fieldwork training)

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2101 Earth and Ocean Systems

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	15
Seminars	
Practical Classes & Workshops	18
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	117
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Jan Zalasiewicz
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination	60		1.5		
002	Report from guided independent study	40				

Intended Learning Outcomes

On successful completion of the module, a typical student should be able to:

- Demonstrate knowledge and understanding of key aspects of chemical and physical interactions between the mantle, crust, sediment reservoir, seawater and atmosphere, and how these 'reservoirs' might have changed over geological time.
- Describe how the origin and evolution of life is linked to the evolution of the Earth's ocean system.
- Discuss trends in the evolution of the Earth's mantle and ocean, assessing the factors involved.
- Undertake simple calculations and base arguments on the results that are obtained.

Work with (manipulate, analyse, synthesize, discuss) a range of geochemical data used as proxies for key Earth and ocean processes .

Work independently and in teams to analyse and present information on selected Earth System processes, within a report.

Teaching and Learning Methods

A combination of lectures and three hour practical classes, plus independent reading and group work. Each lecture will be typically accompanied by guided reading as well as the expectation of independent reading. A range of literature styles will be explored, making students more familiar with a range of writing (and reading) styles used in Earth science.

Practicals will provide a range of skills and learning opportunities to reinforce material in the module and elsewhere in the degree.

Assessment Methods

Examination, Report

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2102 Structure and Tectonics

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	
Practical Classes & Workshops	32
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	60
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	42
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Richard Walker
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam	70		1.5		
002	Group Presentation	30				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Identify and describe, quantitatively, common geological structures
- Explain deformation processes that create major rock structures
- Discuss and quantify principles of stress and strain
- Plot and interpret structural datasets
- Discuss theories, paradigms, concepts, and principles concerned with tectonics
- Synthesise multidisciplinary datasets to build deformation histories

Teaching and Learning Methods

Interactive lecture-practical sessions will introduce concepts of stress and strain, quantitative description of tectonic structures, and methods of structural data plotting, reduction, and interpretation. Structural plotting and display will be combined with GIS techniques, to develop data visualization techniques.

Assessment Methods

Short format exam questions, practical format exam questions, group presentation

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2103 Magmatic and Metamorphic Processes

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	16
Seminars	
Practical Classes & Workshops	32
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	102
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Marc Reichow
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam	30		2		
002	Coursework	70				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Describe the formation of igneous and metamorphic rocks from a variety of tectonic settings
- Describe some processes that are responsible for generating the range of igneous and metamorphic rocks and their textures
- Describe and identify a range of minerals, igneous rocks and metamorphic rocks in hand specimen and thin section
- Draw and interpret rock assemblages, mineral compositions and phase relationships on binary and ternary diagrams
- Evaluate geochemical data pertaining to igneous systems

Teaching and Learning Methods

Workshops, including introductory lectures followed by practical classes

Assessment Methods

Examination and coursework

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

Background reading and research in preparation for workshops.

GL2104 Interpreting Geological Maps and Stratigraphy

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	9
Seminars	
Practical Classes & Workshops	45
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	96
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 2
Occurrence: E
Coordinator: Michael Branney
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework (Resit Exam)	50				
002	Exam	50		1.5		

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- analyse, describe and interpret geological maps,
- describe and discuss the major types and uses of modern stratigraphical analysis (including litho-/bio-/chrono-/magneto-/astro-/event/isotope/seismic/sequence stratigraphies and radiometric age-dating)
- recognise rock types and fossil groups and discuss their stratigraphic context; and devise lithostratigraphies from rock successions and be able place them within a bio- and chronostratigraphical framework.
- discuss the record of key structural and stratigraphic events in the geological evolution of the UK

Teaching and Learning Methods

Practical classes with formative feedback
 Practical classes to introduce rock/fossil/mineral/map displays (directed study)
 lectures

Assessment Methods

Coursework, Exam

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2105 Depositional Processes and Environments

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	10
Seminars	
Practical Classes & Workshops	34
Tutorials	
Fieldwork	
Project Supervision	2
Guided Independent Study	102
Demonstration	2
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Jan Zalasiewicz
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Exam	80		2		
003	Group Practical	20				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Describe a depositional environment, its component subenvironments, and the key depositional processes that operate in that environment
- Describe how an environment may evolve through time and the resulting sedimentary succession
- Interpret depositional environments by combining observations from sedimentary data including: mineralogy, textures & structures (in hand specimen, thin section and field images), graphic sedimentary logs, palaeoflow measurements & fossils
- Apply knowledge of processes and depositional environments and use stratigraphic techniques to interpret and correlate multiple sedimentary logs.

Teaching and Learning Methods

The approach is a mixture of lectures; short and long practical exercises; guided scheduled practical work; teamwork practicals; independent study

Assessment Methods

Exam (theory and practical), group practical

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2106 Introductory Mineral Deposits

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	48
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	93
Demonstration	
Supervised time in studio/workshop	9
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Gawen Jenkin
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework Report	45				
002	Examination	40		2		
003	Coursework Practical Folder	10				
004	Coursework MCQ	5				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- List the chemical formulae of common ore minerals.
- Understand the principles and terminology of reflected light microscopy and use a reflected light microscope to accurately observe ore minerals and their textures
- Photograph, describe and identify the common ore minerals and their textural relationships in hand specimen, and reflected light and some in transmitted light. Explain the origin of the textures and paragenesis.
- Record information for revision and final report in an electronic practical folder.
- Describe the mineralogy, ore textures and geological and tectonic relationships of specified simple mineral deposits, and use these features to predict likely areas of mineralization.
- Explain societal uses of the ores produced and the economic and environmental implications of extraction.
- Discuss the competing ideas for the genesis of these deposits.
- Integrate information from the literature with their own observations to produce a report describing the geology and genesis of a chosen ore suite.
- Work effectively as a team of 3-4 students to: perform a literature search using electronic databases; use the internet effectively to find information and knowledge; collect, record and analyse data; analyse, synthesize and summarise information; use wordprocessing software to edit and collaboratively review drafts of a report; produce a final specifically formatted desk study report using a high standard of written English (including good use of grammar, spelling and sentence structure) as required for company reports; generate a video describing their results and interpretation; cite and reference information sources in a scientific report; manage time effectively and work to deadlines.

Teaching and Learning Methods

Integrated workshop sessions for learning about basic mineral deposit types.

An initial intensive lecture and practical course equips the students with the requisite skills to then undertake independent team project work.

Formative feedback during the module is given by a) advice in workshop sessions, b) peer and self-assessment of practical books of specific practicals, c) multiple-choice tests, d). marking of preliminary drafts of sections of report, e). consultation sessions.

Assessment Methods

Coursework MCQ, Exam, Formative test, Coursework Report, Coursework Practical Folder

Pre-Requisites

Co-Requisites

GL2106 Introductory Mineral Deposits

Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2107 Major Events in the History of Life

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	15
Seminars	
Practical Classes & Workshops	24
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	109
Demonstration	2
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Sarah Gabbott
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Written exam	70		2		
002	Group project with individual report	20				
003	Group YouTube video	10				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- By the end of this module, typical students should be able to outline some of the major evolutionary innovations and macroecological events in the history of life on Earth and their impact on the biosphere.
- Students will be able to outline key evolutionary concepts describing the way in which life has evolved through the course of Earth history. Examples may include: adaptive radiation and biodiversification, functional morphology, mass extinction events, the importance of exceptionally-preserved deposits, human evolution and the Cambrian explosion.
- Students will be able to evaluate data that is used to indicate extinction events.
- Students will be able to communicate a scientific message to a non-scientific general audience through video
- Students will be able to assess life modes within a community of fossils

Teaching and Learning Methods

Lectures, practical classes, demonstrations and work sheets including directed extra reading.
External teaching from Leicester Learning Institute on 'how to communicate through video'.

Assessment Methods

Written exam, Peer assessed you-tube video, Group project with individual report

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL2108 Principles of Geophysics

Academic Year: 2018/9
Module Level: Year 2
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures	18
Seminars	
Practical Classes & Workshops	36
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	96
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Academic Year
Occurrence: E
Coordinator: Max Moorkamp
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Final exam	40		1.5		
002	Assessed computer practical	20				
003	Coursework	40				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Understand the principles of different geophysical methods
- Use scientific computing software, e.g. Matlab
- Conduct a geophysical survey and check the quality of the data
- Relate geophysical measurements to structures within the Earth

Teaching and Learning Methods

Field demonstration of geophysical equipment and measurement procedures, lectures on geophysical methods, computer based practicals

Assessment Methods

Exam, practical, coursework, assessed practical

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL3102 Environmental Geoscience

Academic Year: 2018/9
Module Level: Year 3
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures
 Seminars
 Practical Classes & Workshops
 Tutorials
 Fieldwork
 Project Supervision
 Guided Independent Study
 Demonstration
 Supervised time in studio/workshop
 Work Based Learning
 Placement
 Year Abroad
 Total Module Hours

Period: Semester 1
Occurrence: E
Coordinator: Daniel Smith
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (final)	80		1.5		
002	Practical Exercises	20				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Demonstrate the methods used to investigate or quantify the environment and environmental baselines, and discuss their limitations
- Describe the main modes of exposure of humans to potentially harmful environmental agents.
- Discuss the physico-chemical mechanisms of pollution (such as acid rain, ozone depletion)
- Critically assess the data for contamination in various environments.
- Outline and describe the range of environmental impacts that result from anthropogenic modification of the natural environment (e.g. by mining, urbanization or agriculture).
- Describe environmental mitigation techniques (such as waste disposal) and critically evaluate their necessity and usefulness.

Teaching and Learning Methods

Lectures, practical exercises, reading groups / seminars and independent study.

Assessment Methods

Examination and Practical Exercises

Pre-Requisites
Co-Requisites
Excluded Combinations
Guided Independent Study: Indicative Activities

Independent reading, practical exercises and associated software exercises, exam technique session

GL3103 Petroleum Reservoir Petrophysics

Academic Year: 2018/9
Module Level: Year 3
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures
 Seminars
 Practical Classes & Workshops
 Tutorials
 Fieldwork
 Project Supervision
 Guided Independent Study
 Demonstration
 Supervised time in studio/workshop
 Work Based Learning
 Placement
 Year Abroad
 Total Module Hours

Period: Semester 1
Occurrence: E
Coordinator: Mike Lovell
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (final)	70		2		
002	2 Coursework Tests	30				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Describe and compare the characteristics and petrophysical properties of conventional and unconventional petroleum reservoirs
- Explain how the distribution of fluids in a conventional reservoir is controlled by the fluid and solid properties, the capillary pressure, and the porosity and permeability
- Describe and criticize laboratory/core and borehole /log petrophysical measurements and interpretation techniques
- Interpret laboratory (core) and downhole (log) petrophysical data and differentiate downhole log responses to various lithologies and fluids
- Calculate petrophysical properties (such as porosity, permeability, saturation, pressure gradients and free water level), and describe different fluids in the reservoir, using equations and graphical data

Teaching and Learning Methods

The approach is a mixture of seminar-style classes composed of short lectures, and discussions together with short practical exercises; individual work and teamwork discussions. An industry visit to Weatherford at East Leake is included when possible; an industry seminar may replace this when it is not feasible

Assessment Methods

Examination and (2) Coursework tests

Pre-Requisites
Co-Requisites
Excluded Combinations
Guided Independent Study: Indicative Activities

Specific directed reading related to topics covered, plus additional related topics, including new developments. Encouragement in attending campus based seminars, including seminars off campus where feasible. Completion of practical exercises including application of petrophysical skills and knowledge.

GL3107 Reflection Seismology

Academic Year: 2018/9
Module Level: Year 3
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures
 Seminars
 Practical Classes & Workshops
 Tutorials
 Fieldwork
 Project Supervision
 Guided Independent Study
 Demonstration
 Supervised time in studio/workshop
 Work Based Learning
 Placement
 Year Abroad
 Total Module Hours

Period: Semester 2
Occurrence: E
Coordinator: Richard England
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework	100				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- List, describe use and assess the effectiveness of the techniques used in 2D seismic reflection data processing
- Design and small-scale seismic survey
- Demonstrate a knowledge of and apply the range of mathematical techniques available for analysis and filtering of digital time series data
- Process seismic data to produce a stacked section
- Prepare a technical report to a high standard (i.e. with correct spelling, grammar, sentence and paragraph construction and illustrated clearly).

Teaching and Learning Methods

Students follow a course of lectures and practical work covering the theory and practice of seismic reflection methods, averaging 2 x 1-hour lectures and 3 hours practical per week. During this they will be trained to process seismic data using a commercial standard seismic reflection data processing system (Landmark Promax or equivalent). Using this they will process example data. Private study time should be spent reinforcing the knowledge and skills being delivered. They will be advised on the production of a processing report and have an opportunity to examine an actual example of commercial practice.

Assessment Methods

Coursework

Pre-Requisites
Co-Requisites
Excluded Combinations
Guided Independent Study: Indicative Activities

Revision of mathematical techniques, processing seismic data, report writing.

GL3109 Mineral Exploration and Evaluation

Academic Year: 2018/9
Module Level: Year 3
Scheme: UG
Department: Geology
Credits: 15

Student Workload (hours)

Lectures
 Seminars
 Practical Classes & Workshops
 Tutorials
 Fieldwork
 Project Supervision
 Guided Independent Study
 Demonstration
 Supervised time in studio/workshop
 Work Based Learning
 Placement
 Year Abroad
 Total Module Hours

Period: Semester 2
Occurrence: E
Coordinator: David Holwell
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Coursework project - exploration	65				
002	Coursework project - evaluation	35				

Intended Learning Outcomes

On successful completion of the module, students should be able to:

- Be aware of the major techniques used in mineral exploration
- Recognize and identify the presence and nature of orebodies on the basis of geochemical and geophysical data
- Review and analyse large datasets using relevant software programs
- Calculate economic metrics applicable to mineral resources, such as net present value, internal rate of return and payback period.
- Rank and critically evaluate different projects or project scenarios in terms of financial risk
- Critically evaluate data quality
- Summarise their work within a concise, professional style report

Teaching and Learning Methods

Lectures, laboratory practical classes (including software demonstrations and workshops), independent project work, project based workshops and surgeries.

Assessment Methods

Coursework project – exploration
 Coursework project - evaluation

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

- Analysis of data provided to students weekly in independent time.
- Browsing financial (commodities) news for contemporary information on industry.
- Software familiarization activities

GL4036 Remote Sensing and GIS for Geologists

Academic Year: 2018/9
Module Level: Year 4
Scheme: UG
Department: Geology
Credits: 10

Student Workload (hours)

Lectures	4
Seminars	4
Practical Classes & Workshops	12
Tutorials	0
Fieldwork	0
Project Supervision	4
Guided Independent Study	51
Demonstration	0
Supervised time in studio/workshop	0
Work Based Learning	0
Placement	0
Year Abroad	0
Total Module Hours	75

Period: Semester 1
Occurrence: E
Coordinator: Richard Walker
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Practical work - presentation	15				
002	Coursework - independent project (Final)	85				

Intended Learning Outcomes

By the end of this module, typical students should be able to:

- Find, import and manage remote-sensed datasets in 2D and 3D visualization softwares
- Analyse and interpret remote-sensed datasets to produce a geological model
- Explain the applications and limitations of remote-sensing techniques
- Create, edit and work with georeferenced spatial data and present this clearly in appropriate formats
- Present information as a scientific report and orally to a multi-disciplinary group.

Teaching and Learning Methods

Students will learn basic concepts of GIS and remote sensing through a series of 5 lectures. Concepts will be reinforced and practiced during 5 hands-on practical sessions, and through self-guided practice by building a working GIS. Students will also learn the breadth of GIS utility from their peers during student-presentation sessions (depending on student numbers).

Assessment Methods

One student project to be presented orally (e.g., using PowerPoint or similar). One 4-page illustrated abstract (coursework) to be submitted.

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL4067 Evolutionary Palaeobiology

Academic Year: 2018/9
Module Level: Year 4
Scheme: UG
Department: Geology
Credits: 10

Student Workload (hours)

Lectures	8
Seminars	0
Practical Classes & Workshops	16
Tutorials	0
Fieldwork	0
Project Supervision	0
Guided Independent Study	51
Demonstration	0
Supervised time in studio/workshop	0
Work Based Learning	0
Placement	0
Year Abroad	0
Total Module Hours	75

Period: Semester 1
Occurrence: E
Coordinator: Tom Harvey
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	100		2		

Intended Learning Outcomes

At the end of this module, typical students should be able to: synthesize knowledge of advanced palaeobiological concepts (including evolutionary patterns and processes; the role of fossils in evolutionary theory and molecular clocks; basic developmental genetics; the origin animal body plans; the history of biodiversity and biodiversity) to assess and explain major patterns and events in the history of life.

Teaching and Learning Methods

Lectures, seminars, discussion groups, directed reading.

Assessment Methods

Essay-style examination.

Pre-Requisites
Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities

GL4076 Igneous Petrogenesis

Academic Year: 2018/9
Module Level: Year 4
Scheme: UG
Department: Geology
Credits: 20

Student Workload (hours)

Lectures	
Seminars	
Practical Classes & Workshops	45
Tutorials	
Fieldwork	
Project Supervision	
Guided Independent Study	105
Demonstration	
Supervised time in studio/workshop	
Work Based Learning	
Placement	
Year Abroad	
Total Module Hours	150

Period: Semester 1
Occurrence: E
Coordinator: Marc Reichow
Mark Scheme: UG Module Mark Scheme

No.	Assessment Description	Weight %	Qual Mark	Exam Hours	Ass't Group	Alt Reass't
001	Examination (Final)	70		3		
002	Coursework - mini project	30				

Intended Learning Outcomes

By the end of this module, typical students should be able to

- explain igneous petrogenesis, high-temperature geochemistry, and crust-mantle evolution
- provide an effective evaluation of a set of geochemical data (major, trace element and isotopic)
- use geochemical data in order to forward model fractional crystallisation and partial melting processes, using a spreadsheet;
- prepare one short report on an aspect of igneous petrogenesis
- evaluate complex and multidimensional geochemical datasets
- input, manipulate, plot and interpret data using a spreadsheet
- write a report to a standard required by scientific journals

Teaching and Learning Methods

Lectures, seminars, practical classes and demonstrations, and example sheets.

Assessment Methods

Essay-style answer examination and practical examination; short report; verbal critique.

Pre-Requisites

GL2043

Co-Requisites
Excluded Combinations

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Guided Independent Study: Indicative Activities