

MODULE TITLE	Field Geology and Geological Maps		CREDIT VALUE	30
MODULE CODE	CSM1036		MODULE CONVENER	Prof Duncan Pirrie (Coordinator)
DURATION: TERM	1	2	3	
DURATION: WEEKS	1-11	1-11		
Number of Students Taking Module (anticipated)			38	

DESCRIPTION - summary of the module content

To be a geologist it is essential that you can describe and interpret rocks, associated structures and landforms whilst working in the field. This module aims to introduce students to the required skills of observation and data recording, allowing them to confidently deal with a range of different geological scenarios. In addition we explore how geological data is presented on maps and cross sections and how we can read a geological map to understand how an area has evolved through time. This is a core module for students on the Year 1 Applied Geology and Engineering Geology and Geotechnics programmes.

AIMS - intentions of the module

Field Geology and Geological Maps aims to introduce Level 1 students to the recording, analysis and synthesis of geological field data. In addition the module also introduces the principles of geological mapping, the interpretation of geological maps and the preparation of geological cross sections. By the end of the module, the students will be confidently able to collect field data from a range of geological settings, interpret geological processes and test hypotheses on the basis of these data. Students will also be able to understand how to read geological maps and construct cross-sections.

INTENDED LEARNING OUTCOMES (ILOs) (see assessment section below for how ILOs will be assessed)

Module Specific Skills and Knowledge:

1. Prepare clear detailed legible field notes, sketches, graphic sedimentary logs, and small scale plans/maps and cross-sections.
2. Describe a range of igneous, metamorphic and sedimentary rock types based on the field identification of minerals and the recognition of grain/crystal size, texture and fabric.
3. Measure and record planar and linear structural data. Describe and record folds, foliations and faults.
4. Locate themselves accurately using a compass and base map, and develop the ability to "read" a base map to locate themselves.
5. Understand the basic principles of geological mapping and stratigraphy including lithostratigraphy, biostratigraphy and chronostratigraphy.
6. Describe macrofossils and trace fossils within their sedimentological context in the field.
7. Describe and record sedimentary structures and understand their significance in terms of identifying the younging direction in a deformed area.
8. Have a general understanding of field safety issues and risk assessment
9. Understand the application of lithostratigraphy in geological mapping.
10. Understand how geology is represented on geological maps and how outcrop patterns reflect the interaction between the shape and orientation of geological units and topography.
11. Demonstrate how geological maps can be used to interpret the geology and geological history of an area.
12. Construct geological cross-sections from geological map data.
13. Interpret the geology of several areas of the UK using geological maps.

Discipline Specific Skills and Knowledge:

14. Transfer information gained through formal taught modules (e.g. Geology) to a field-based scenario.
15. Visualize in three-dimensions.

Personal and Key Transferable/ Employment Skills and Knowledge:

16. Problem solve
17. Synthesize a range of data.
18. Work with and relate to others.
19. Collect data and communicate in a variety of formats.

SYLLABUS PLAN - summary of the structure and academic content of the module

The geological maps part of the module develops material covered in practicals 8-9 of the Geology module (CSM 1030) in Semester 1. Weeks 1-3 are based on problem maps while weeks 4-9 use real geological maps at a variety of scales. Topics covered are simple models of outcrop geometries associated with horizontal, vertical and inclined layers and those generated in folded and faulted sequences, as well as unconformities and procedures for deciphering geological histories from geological maps. Lectures and practicals in advance of the fieldwork programmes include: health and safety and first aid; geological field equipment; data recording - notes, sketches, graphic logs; hand specimen recognition of rocks and minerals; the compass clinometer and the measurement of planar and linear features; definition of mappable units; data recording on field slips. During fieldwork the following skills will be developed: locating oneself on a map; description of igneous, metamorphic and sedimentary rocks; recording structural data and the description of folds and faults; description of sedimentary structures; description of macrofossils and trace fossils in the field; data recording on field slips, maps, notebooks etc; preparing geological cross sections; synthesising field data and interpretation.

LEARNING AND TEACHING

LEARNING ACTIVITIES AND TEACHING METHODS (given in hours of study time)

Scheduled Learning & Teaching Activities	40.00	Guided Independent Study	132.00	Placement / Study Abroad
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DETAILS OF LEARNING ACTIVITIES AND TEACHING METHODS

Category	Hours of study time	Description
Scheduled learning & teaching activity	40	Lectures & Practical sessions
Scheduled learning & teaching activity	16 days	Fieldwork
Guided independent study	132	Private study

ASSESSMENT

FORMATIVE ASSESSMENT - for feedback and development purposes; does not count towards module grade

SUMMATIVE ASSESSMENT (% of credit)

Coursework	75	Written Exams	0	Practical Exams	25
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DETAILS OF SUMMATIVE ASSESSMENT

Form of Assessment	% of Credit	Size of Assessment (e.g. duration/length)	ILOs Assessed	Feedback Method
Assessment of field notebooks term 1	5		1,2,3,8,14-18	Detailed feedback on field notebooks
Assessment of field notebooks and assessed field exercise term 2	20		1-3,7,8,14-18	Detailed feedback on field notebooks
Practical exam based upon geological map	25	2 hours	9-16	Tutor meeting
Assessment of primary field data collection (e.g. field maps, notebooks, sketch cross sections, graphic logs) and short synthesis reports	50	1000 words	1-9, 13-18	Detailed feedback on field slips

DETAILS OF RE-ASSESSMENT (where required by referral or deferral)

Original Form of Assessment	Form of Re-assessment	ILOs Re-assessed	Time Scale for Re-reassessment
Summative assessment	Additional assessment	As above	August Ref/Def period
Examination	Additional examination	As above	August Ref/Def period

RE-ASSESSMENT NOTES

As above 1 piece of CW 75% and/or 1 Exam 25%

RESOURCES

INDICATIVE LEARNING RESOURCES - The following list is offered as an indication of the type & level of information that you are expected to consult. Further guidance will be provided by the Module Convener

Basic reading:

Lisle, R.J. 1995. Geological structures and maps: a practical guide (second edition). Butterworth-Heinemann, 104p.

Maltman, R. 1998. Geological maps: an introduction (Second edition). John Wiley & Sons, New York, 260p.

ELE - College to provide hyperlink to appropriate pages

Lectures and practicals will be loaded on to ELE along with Field Course training manuals. Illustrations of different geological structures will also be uploaded for private self study along with examples of good practice relating to field data collection. Self assessment tests on mineral and rock identification.

Web based and electronic resources:

UK Geological Maps

http://www.bgs.ac.uk/education/geology_of_britain/home.html

The British Geological Survey Geology of Britain web pages. These provide free access to small-scale maps that can be modified to include topography, landsat imagery and bedrock and superficial geology.

<http://www.bgs.ac.uk/education/makeamap/home.html>

Allows you to make and customize your own small-scale geological map of the UK.

Reading list for this module:

Type	Author	Title	Edition	Publisher	Year	ISBN	Search
Set	Coe, A	Geological Field Techniques	5th	Wiley-Blackwell			[Library]
Set	Lisle, R.J., Brabham, P. and Barnes, J.W.	Basic Geological Mapping		Geological Society of London handbook series, Wiley-Blackwell	2011		[Library]
Set	McClay, K	The mapping of geological structures		Geological Society of London handbook series, Wiley-Blackwell	1987		[Library]
Set	Tucker, M.E	Sedimentary rocks in the field		Geological Society of London handbook series, Wiley-Blackwell	2011		[Library]
Set	Jerram, D. and Petford, N..	The field description of igneous rocks		Geological Society of London handbook series, Wiley-Blackwell	2011		[Library]
CREDIT VALUE		30	ECTS VALUE		15		
PRE-REQUISITE MODULES		None					
CO-REQUISITE MODULES		None					
NQF LEVEL (FHEQ)		1 (NQF Level 4)		AVAILABLE AS DISTANCE LEARNING		No	
ORIGIN DATE		Monday 12 March 2012		LAST REVISION DATE		Wednesday 17 October 2012	
KEY WORDS SEARCH		Field geology, geological techniques, mapping.					