

Higher National Unit Specification

General information for centres

Unit title: Earth Science

Unit code: DN36 34

Unit purpose: This unit is designed to provide candidates' with the ability to describe the geology of the earth's surface and the processes that drive geological change. This unit is intended for students undertaking the HNC Applied Sciences and HND Environmental Sciences awards although it may be delivered as a stand alone unit.

On completion of the Unit the candidate should be able to:

1. Describe the origin and dynamics of the lithosphere.
2. Describe the origin and classification of crustal rocks and the mineral composition of the major rock types.
3. Describe the origin, classification and composition of soil systems.

Credit points and level: 1 HN Credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Entry is at the discretion of the centre although it would be beneficial, though not essential, for candidates to have studied Geography or Geology at Intermediate 2 or Higher level (SCQF levels 5 and 6).

Core skills: There may be opportunities to gather evidence towards core skills or core skill components in this Unit. The production of the assessment documents will involve Communication skills in reading, writing/talking and listening (developed), IT (developed) and Working with Others (developed). The same process could also be used to evidence Problem Solving at Higher level.

Context for delivery: This Unit is included in the frameworks of the Group Awards in HNC Applied Sciences and HND Environmental Sciences, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes. It should be noted that this unit could provide additional positive material that could be used to support other units with a given framework.

Assessment: This unit is assessed by three assessments. Assessment can reflect the teaching approach taken by an individual centre in that each assessment can be undertaken on an outcome by outcome basis although, an integrated approach to assessment is highly recommended. The means by which integration may be achieved is described in the Guidance notes on assessment at the end of this descriptor.

General information for centres (cont)

Outcomes 1 should be assessed by a brief report. Outcomes 2 and 3 should be assessed by a short closed book assessment and an open book descriptive commentary.

Higher National Unit specification: statement of standards

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The sections of the Unit stating the Outcomes, knowledge and/or skills, and evidence requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the knowledge and/or skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

Outcome 1

Describe the origin and dynamics of the lithosphere.

Knowledge and/or skills

- ◆ Earth's interior and the physical methods used to construct the current model
- ◆ Earth's crust and plate movements which shape the surface of the earth
- ◆ Major fault types and their origin in the earth's crust

Evidence requirements

Candidates will need to provide evidence to demonstrate their knowledge and/or skills by showing that they can:

- ◆ describe the earth's interior and the physical methods used to construct the current model Physical methods – seismic surveys.
- ◆ describe the earth's crust and plate movements which shape the surface of the earth: Plate tectonics; divergent, convergent and transform plate boundaries; continental drift.
- ◆ describe the major fault types and their origin in the earth's crust:
 - fault types: normal, reverse, transverse, thrust
 - folds – anticlines / synclines.

Evidence for this outcome should be gathered in an open book exercise which can be undertaken in the candidates own time. This outcome should be assessed by an assignment of approximately 700 words, illustrated throughout by referenced material and / or photographs. The bullet points outlined in the evidence requirements should form the structure of the answer.

Higher National Unit specification: statement of standards (cont)

Unit title: Earth Science

Assessment guidelines

This assessment is open book and there are no restrictions on the conditions under which assessment is carried out. Evidence for Outcome 1 can be gathered by field excursions, visits, text books, periodicals, journals, reports and the internet would all be suitable sources of material which could be used to illustrate the knowledge and skills items listed. A field study and visit could also be integrated for the open book assessment for outcomes 2 and 3.

Outcome 2

Describe the origin and classification of crustal rocks and the mineral composition of the major rock types.

Knowledge and/or skills

- ◆ Origin of crustal rocks
- ◆ Classification of crustal rocks
- ◆ Major rock types in terms of mineral composition

Evidence requirements

Candidates will need evidence to demonstrate their skills and/or knowledge by showing that they can:

- ◆ Describe the origin of crustal rocks: Earth processes – the rock cycle
- ◆ Define the classification of crustal rocks: igneous, metamorphic and sedimentary rocks
- ◆ Describe major rock types in terms of their mineral composition :Rock types – Granite, Basalt, Schist, Gneiss, Shale, Sandstone, Limestone.

Evidence for this outcome should be gathered in a closed book exercise under controlled conditions. Candidates should undertake an identification exercise to classify all 7 rock types listed. This part of the assessment should be integrated with outcome 3

The candidate should also produce a written/oral commentary on each rock type classifying each as to: their origin (formation), their group (igneous, metamorphic or sedimentary) and their mineral composition. This part of the outcome should be assessed under open book conditions and candidates should research this area in their own time. Candidates should complete a short descriptive commentary of their findings.

Assessment guidelines

The closed book assessment should be integrated with Outcome 3. For the open book assessment, candidates could generate evidence by taking part in a field trip/visit to classify rocks. If this is not practical then journals, internet and books can be utilised.

Higher National Unit specification: statement of standards (cont)

Unit title: Earth Science

Outcome 3

Describe the origin, classification and composition of soil systems.

Knowledge and/or skills

- ◆ Soil system processes.
- ◆ Structure and composition of soils
- ◆ Soil characteristics.
- ◆ Factors affecting soil formation
- ◆ Soil regimes.
- ◆ Soil classification.

Evidence requirements

Candidates will need evidence to demonstrate their skills and/or knowledge by showing that they can:

- ◆ describe soil system processes :weathering, detrital deposition
- ◆ describe the structure and composition of soils: profiles, horizons; mineral, organic matter, water, air.
- ◆ describe soil characteristics: texture, structure, chemistry
- ◆ describe the factors affecting soil formation: climate, parent material, land forms, organisms, time.
- ◆ describe soil regimes :podzolization, gleying, calcification, salinisation
- ◆ describe soil classification :podzols, peaty soils, brown earths; rankers / skeletal soils

Evidence for this outcome should be gathered in a closed book exercise under controlled conditions. Candidates should undertake an identification exercise where they have to classify a minimum of 4 soil types. This part of the assessment should be integrated with outcome 2.

The candidate should also produce a written/oral commentary on each soil classification detailing: formation processes- weathering, detrital deposition: Structure – profile, horizon: Composition – mineral, organic, water, air: Characteristics – texture, structure, chemistry: Factors – climate, parent material, land forms, organisms, time: Regimes – podzolization, gleing, calcification, salinisation. This part of the outcome should be assessed under open book conditions and candidates should research this area in their own time. Candidates should complete a short descriptive commentary of their findings .

Assessment guidelines

The candidate should produce a commentary on each soil classification detailing: Formation processes – weathering, detrital deposition; Structure – profile, horizon; Composition – mineral, organic, water, air; Characteristics – texture, structure, chemistry; Factors – climate, parent material, land forms, organisms, time; Regimes – podzolization, gleying, calcification, salinisation. This assessment should be open book and could be carried out as part of a field trip. This assessment should be integrated with Outcome 2.

Administrative Information

Unit code:	DN36 34
Unit title:	Earth Science
Superclass category:	RF
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Higher National Unit specification: support notes

Unit title: Earth Science

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

Guidance on the content and context for this Unit

This unit can be delivered free standing or as part of a Group Award. When delivered as part of a Group Award it would be beneficial, during delivery of the other units, to highlight the positive impacts of geology and geological systems as they arise. This would help emphasise the underpinning importance of geology and earth science in the natural world. Throughout delivery full use should be made of field trips, photographic evidence, external speakers, video and TV, websites and textbooks. An extended study tour would be useful in order to cover the majority of the content.

Guidance on the delivery and assessment of this Unit

Opportunities for developing Core Skills

In order to achieve this unit candidates are required to illustrate sufficient evidence that they have a clear understanding of the unit content. This can be evidenced by extended responses (unsupervised) and restricted response (closed book).

There are major opportunities for integration of assessment for Outcomes 1, 2, and 3. The content of these outcomes could be covered in a series of field excursions for example: Highland Boundary Fault; Caledonian orogeny; intrusive rocks and extrusive rocks and their associated metamorphic aureoles; Midland Valley; Great Glen Fault; the Moine Thrust etc. Indeed the content of these outcomes would be excellent for an extended study tour. During these excursions the opportunities would arise to study: geological features – faults, folds and fractures; rock types; weathering and its associated landscape features; soil types deriving from a range of parent materials; etc. The assessment could be based on production of a field notebook that identifies and describes the content of the outcomes.

Open learning

For information on normal open learning arrangements, please refer to SQA guide *Assessment and Quality Assurance of Open and Distance Learning* (SQA 2000).

Candidates with additional support needs

This Unit specification is intended to ensure that there are no artificial barriers to learning or assessment. The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative Outcomes for Units. For information on these, please refer to the SQA document *Guidance Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on the SQA website www.sqa.org.uk.

General information for candidates

Unit title: Earth Science

The unit aims to provide you with a clear understanding of fundamental geology and geological processes.

The three learning outcomes are:

- ◆ Describe the origin and dynamics of the lithosphere
- ◆ Describe the origin and classification of crustal rocks and the mineral composition of the major rock types
- ◆ Describe the origin, classification and composition of soil systems

Outcome 1 looks the origins and dynamics of the lithosphere – the earths crust and upper mantle: Assessed by the production of a report (including labelled diagrams) with a maximum of 700 words.

Outcome 2 deals with how rocks are formed, how we classify them and the minerals that comprise them: Assessed by an identification exercise (7 rock types) accompanied by notes as to the origin, whether they are igneous, sedimentary or metamorphic and their mineral composition.

Outcome 3 is about soils and their formation, how we classify them, their composition, their physical characteristics, factors that affect soil formation – climate, etc. and the different soil regimes: Assessed by an identification / classification exercise (4 soils: Podzols; gleys; brown earths, and; rankers / skeletal soils) accompanied by notes addressing the above.