



Higher National Graded Unit specification

General information for centres

This Graded Unit has been validated as part of the HND Green Technology. Centres are required to develop the assessment instrument in accordance with this validated specification. Centres wishing to use another type of Graded Unit or assessment instrument are required to submit proposals detailing the justification for change for validation.

Graded Unit title: Green Technology: Graded Unit 3

Graded Unit code: F3R0 35

Type of Graded Unit: Examination

Assessment Instrument: Closed-book Examination

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

**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.*

Purpose: This Graded Unit is designed to provide evidence that the candidate has achieved the following principal aims of the HND Green Technology:

- ◆ provide the candidate with a deeper underpinning knowledge and understanding of the physical and biological sciences
- ◆ develop candidates' knowledge and understanding of the application of physical and biological sciences to the development and use of sustainable technologies and renewable resources in rural areas
- ◆ develop candidates' knowledge and understanding of the environmental issues, economic considerations and regulatory factors that influence the development and use of sustainable technologies and renewable resources in rural areas
- ◆ prepare candidates for progression to degree level study in Green Technology and related areas

Recommended prior knowledge and skills: It is recommended that the candidate should have completed or be in the process of completing the following Units relating to these specific aims prior to undertaking this Graded Unit:

Unit Code	Unit Title
F2G9 35	Farm Scale Renewable Energy
F32B 35	Energy Performance of Buildings
F2EH 35	Transport Towards a Sustainable Future
F21H 35	Biomass: Technologies for Energy and Bioproducts
F2E5 35	Agroecosystems: Energetic Efficiency
F2EE 34	Pollution and Waste Management: An Introduction

General information for centres (cont)

Core Skills: There are no Core Skills embedded in this Graded Unit specification.

Assessment: This examination-based Graded Unit is a closed-book examination. It will consist of a written examination of 3 hours.

Administrative Information

Graded Unit code: F3R0 35

Graded Unit title: Green Technology: Graded Unit 3

Original date of publication: August 2008

Version: 01

History of changes:

Version	Description of change	Date

Source: SQA

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Higher National Graded Unit specification: instructions for designing the assessment task and assessing candidates

Graded Unit title: Green Technology: Graded Unit 3

Conditions of assessment

The assessment is based on a closed-book examination lasting 3 hours.

If a candidate does not achieve a pass or if a candidate wishes to upgrade, this must be based on a significantly different examination from that given originally. A candidate's grade will be based on his/her achievement on the new assessment event using a significantly different examination, if this results in a higher grade.

The examination should be unseen and the assessment should be conducted in controlled and invigilated conditions.

At all times, the security, integrity and confidentiality of examinations must be ensured.

Instructions for designing the assessment task:

The examination should be designed to assess the candidate's critical knowledge and understanding of the topics relating to the specific aims which this Graded Unit is designed to cover. The questions and corresponding marks should be designed in accordance with the ranges indicated in the table that follows. However, the overall total mark for the examination is 100.

The format of the examination should be designed to meet the following requirements:

- ◆ the examination paper must be divided into five sections corresponding to the Key integrated topics in the following table
- ◆ a blend of question types must be used appropriate to the level of demand
- ◆ the aggregate marks available for the question or questions in each topic area should conform to the percentage weighting given in the following table
- ◆ candidates must attempt all sections

Higher National Graded Unit specification: instructions for designing the assessment task and assessing candidates (cont)

Key topics	Level of demand	Percentage weighting for each topic
Energy efficiency (could include the technology, management, financial or regulatory aspects)	Recall and apply knowledge and understanding using skills equivalent such as explanation, analysis, calculation, discussion, problem solving, drawing conclusions.	20%
Energy flows and transformations (could include cropping, support energy, transport, power Units, generation and distribution systems)	Recall and apply knowledge and understanding using skills equivalent such as explanation, analysis, calculation, discussion, problem solving, drawing conclusions.	20%
Green engineering (could include bioengineering for energy and products, new and evolving technologies for fixed and mobile power and control systems)	Recall and apply knowledge and understanding using skills equivalent such as explanation, analysis, calculation, discussion, problem solving, drawing conclusions.	20%
Environmental impact of green technology (could include, aesthetics, soil/water quality, greenhouse gases, wastes, pollution, land competition)	Recall and apply knowledge and understanding using skills equivalent such as explanation, analysis, calculation, discussion, problem solving, drawing conclusions.	20%
Implementation of green technology (could include marketing, technical, legislative, bio-measures, accreditation schemes, and financial measures)	Recall and apply knowledge and understanding using skills equivalent such as explanation, analysis, calculation, discussion, problem solving, drawing conclusions.	20%

The examination will be marked out of 100. Assessors will aggregate the marks achieved by the candidate to arrive at an overall mark for the examination. Assessors will then assign a grade to the candidate for this Graded Unit based on the following grade boundaries:

- ◆ A = 70% — 100%
- ◆ B = 60% — 69%
- ◆ C = 50% — 59%

Higher National Graded Unit specification: instructions for designing the assessment task and assessing candidates (cont)

Guidance on grading candidates

Candidates who meet the minimum Evidence Requirements will have their achievement graded as a C (competent), A (highly competent), or B (somewhere between A and C). The grade related criteria to be used to judge candidate performance for this Graded Unit is specified in the following table:

Grade A	Grade C
<p>Is a seamless, coherent piece of work or exam script which consistently:</p> <ul style="list-style-type: none"> ◆ interprets and understands the question in away that demonstrates insight and clear understanding of issues and relationships ◆ comprehensively addresses all aspects of the question ◆ demonstrates a comprehensive analysis and evaluation of relevant information ◆ offers logically structured and coherently expressed responses, demonstrating consistent use of correct terminology ◆ is clear and well structured throughout with language and terminology used of a consistently high standard in terms of level, accuracy and technical content ◆ consolidates and integrates required knowledge and skills, linking concepts and ideas and relating answers explicitly to the question ◆ solutions to problems are realistic and practical in terms of the scenario ◆ convincingly argues and shows links between discussions and conclusions, demonstrating comprehensive knowledge and understanding as well as analysis and evaluation skills ◆ provides evidence of possible alternative approaches and arguments as well as an understanding of different interpretations 	<p>Is a co-ordinated piece of work or exam script which:</p> <ul style="list-style-type: none"> ◆ interprets and understands the question in a way that enables the candidate to meet the basic criteria required ◆ answers address the main issues of the question ◆ demonstrates analysis, evaluation and explanation of the question and other relevant information ◆ provides a response which conveys understanding of main issues ◆ is structured, uses language and terminology accurately to express technical content ◆ consolidates and integrates knowledge and skills and some links to concepts and ideas ◆ provides solutions to problem which are feasible ◆ argues and justifies conclusions that link well to basic discussion points ◆ provides evidence of one approach and interpretation

Higher National Graded Unit specification: instructions for designing the assessment task and assessing candidates (cont)

Support notes

This Unit consists of a three hour, closed-book examination, covering five key integrative topic areas. The question (or questions) associated with each key topic should be focussed on knowledge and skills that candidates should be expected to be able to readily recall, integrate and apply. The purpose of the examination is, in part, to prove the candidates' ability to integrate information gleaned from the Units that comprise the course, but also it provides the opportunity for candidates to achieve a grade for the examination that reflects the depth and scope of their knowledge and understanding.

The defined mandatory Units should preferably be scheduled for the first and second terms so that candidates have time to consolidate and deepen their knowledge and understanding by private study and background reading before the examination towards the end of the academic session.

It is recommended that candidates should have experienced an examination type assessment event during the delivery of the award so that they feel comfortable with the format. There should be discussions with candidates on examination technique which should include the timing, the significance of the verbs used in questions, the need to ascertain the scope of the question, and planning responses. Feedback on sample responses (formative assessment) will sharpen their examination techniques.

The examination should be completed under normal examination conditions. That is at a defined time advertised well in advance, in a quiet venue with effective invigilation facilities. Candidates should be provided with clear information regarding examination resits.

Candidates with disabilities and/or additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative assessment arrangements. For information on these, please refer to the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs*, which is available on SQA's website: www.sqa.org.uk.

General information for candidates

This is a single credit Graded Unit (Examination) at SCQF level 8.

This Graded Unit is designed to assess your ability to recall, integrate and apply the essential knowledge and understanding required to meet the principal aims of the HND Green Technology award. The assessment is a closed-book examination lasting 3 hours, held towards the end of the course, which draws together elements from the following defined Units of the Green Technology programme:

- ◆ F2G9 35 *Farm Scale Renewable Energy*
- ◆ F32B 35 *Energy Performance of Buildings*
- ◆ F2EH 35 *Transport Towards a Sustainable Future*
- ◆ F21H 35 *Biomass: Technologies for Energy and Bioproducts*
- ◆ F2E5 35 *Agroecosystems: Energetic Efficiency*
- ◆ F2EE 34 *Pollution and Waste Management*

The examination consists of questions in five areas related to key integrated topic areas of the above Units. These areas are:

- ◆ energy efficiency
- ◆ energy flows and transformations
- ◆ green engineering
- ◆ environmental impact of Green Technology
- ◆ implementation of Green Technology

Each question has the marks for the question identified and the total number of marks available is 100. Assessors mark each section of the examination paper taking into account the criteria outlined. The marks for the examination are then aggregated to arrive at an overall mark for the examination. Assessors then assign an overall grade to the candidate for this Graded Unit based on the following grade boundaries.

- ◆ A = 70% — 100%
- ◆ B = 60% — 69%
- ◆ C = 50% — 59%

Candidates who fail the examination and are offered a re-sit opportunity must undertake a substantially different question paper.