



Higher National Graded Unit specification

General information for centres

This Graded Unit has been validated as part of the HND Applied Bioscience. 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: Applied Bioscience: Graded Unit 3

Graded Unit code: F3D7 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 Applied Bioscience, which are to:

- ◆ provide the candidate with a deeper underpinning knowledge of the biological and physical sciences relevant to the land-based industries
- ◆ develop the candidates' knowledge and understanding of the applications of biological science and technology in the land-based industries and the environmental sector
- ◆ develop knowledge and understanding of ecological and environmental issues
- ◆ prepare candidates for progression to degree level study in Applied Bioscience and Applied Animal Science 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
DJ6X 34	DNA and Molecular Techniques: Theory and Practice
DH2M 35	Immunotechnology: Theory and Practice
F2E5 35	Agroecosystems: Energetic Efficiency
F2EC 35	Livestock Nutrition

General information for centres (cont)

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

Context for delivery: If this Unit is delivered as part of a group award, it is recommended that it should be taught and assessed within the subject area of the group award to which it contributes.

The Assessment Support Pack (ASP) for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. It is a valid, reliable and practicable assessment. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

Assessment: This examination-based Graded Unit is a closed-book examination of 3 hours duration.

Administrative Information

Graded Unit code: F3D7 35

Graded Unit title: Applied Bioscience: 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: Applied Bioscience: 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 paper should be designed to meet the following requirements:

- ◆ the examination paper must be divided into three sections corresponding to the key integrated topics in the following table
- ◆ each section must include at least one question that involves relevant environmental issues or impacts which the candidate must attempt
- ◆ 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
<p>Molecular bioscience and its applications</p> <p>Topics could include: Direct and Indirect methods ELISA techniques: immunology with regards to livestock: Plasmid mapping analysis: DNA sequence analysis, DNA cloning and use of correct molecular probes. Discussion of GM crops — benefits (current and potential) and risks.</p>	Recall and apply knowledge and understanding to provide one or more of the following: explanation, discussion, evaluation, calculation, comparison, appraisal, analysis, problem solving.	30%
<p>Crop Science</p> <p>Topics could include: solar energy conversion: efficiency of crop productivity: increasing world demand for food: minimising environmental impact.</p>	Recall and apply knowledge and understanding to provide one or more of the following: explanation, discussion, evaluation, calculation, comparison, appraisal, analysis, problem solving.	35%
<p>Livestock Science</p> <p>Topics could include: ruminants and non-ruminants requirements; utilisation of different dietary resources: gut microbes in digestion in different animal species: manipulating animal performance: livestock methodology and environmental consequences: efficiency of livestock production.</p>	Recall and apply knowledge and understanding to provide one or more of the following: explanation, discussion, evaluation, calculation, comparison, appraisal, analysis, problem solving.	35%

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%

To pass the examination and achieve the Graded Unit, the candidate must achieve a mark of 50% or above.

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 and viable 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 ◆ responses convey understanding with some relevant points made but responses may be uneven ◆ is structured, with language and terminology used adequate, although not always consistent, in terms of level, accuracy and technical content ◆ consolidates and integrates knowledge and skills but may lack continuity and consistency and does not always show clear links to concepts and ideas ◆ solutions to problem are feasible ◆ argues and justifies conclusions in an acceptable way ◆ provides evidence of one approach and interpretation to solution

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 three key integrated 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 re-sits.

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 Applied Bioscience award. The assessment is a closed-book examination lasting three hours, held towards the end of the course, which draws together elements from the mandatory Units of this Applied Bioscience programme.

The examination consists of questions in three areas related to key integrated topic areas of the above Units. These areas are: Molecular bioscience and its applications, Crop science and Livestock science.

Each section has the marks for the questions 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.