

## Biology/Human Biology

Courses leading to National Qualifications in Biology are offered at Standard Grade, Intermediate 1, Intermediate 2, Higher and Advanced Higher, and in Human Biology at Higher. A National Cluster at Access 3 is also available. Full details of the Course content and assessment arrangements are contained in the relevant Arrangements documents. Information on the Core Skills delivered by the Cluster, Courses and Units in Biology/ Human Biology is provided in the publication *Catalogue of Core Skills in National Qualifications 2001/2002*.

### Standard Grade Biology (0300 01)

#### *Course outline*

The Course is based on seven prescribed topics:

The Biosphere	Investigating Cells
The World of Plants	The Body in Action
Animal Survival	Inheritance
Biotechnology	

These topics are derived from three general aspects of Biology, namely, the biological basis for life, relationships and application of biological principles in work, health and leisure activities.

The Elements of the Course are Knowledge and Understanding, Problem Solving, Practical Abilities and Attitudes. Attitudes will not be assessed for certification purposes.

#### *Course assessment*

The assessable Elements of the Course are Knowledge and Understanding, Problem Solving and Practical Abilities.

The Elements of Knowledge and Understanding and Problem Solving are assessed externally by means of a question paper at each of the two levels, General and Credit. The duration of the question papers and the grades available are as follows:

General Level	(1 hour 30 minutes)	assessing grades 4 and 3
Credit Level	(1 hour 30 minutes)	assessing grades 2 and 1

Each paper will contain multiple-choice items, short-answer questions, extended-answer questions and interpretation questions. In the case of the General level paper, grade 5 will be awarded to candidates who narrowly fail to meet the criteria for grade 4.

The Practical Abilities Element, which involves the candidate in carrying out practical techniques and conducting investigations, is assessed by the teacher. For each candidate, a grade for Practical Abilities, based on the aggregate mark gained for performance in Carrying out Techniques and in Designing and Carrying out Investigations, should be determined in the light of guidance issued by SQA, and all grades should be submitted by **31 March**.

The Elements have a weighting of 2:2:1 in favour of the two externally assessed Elements. The overall award for the subject is the mean of the weighted Element grades.

## Access 3 Biology (C007 09)

### *Cluster outline*

This Cluster comprises three mandatory Units, as follows:

D023 09	Health and Technology (Acc 3)	1 credit (40 hours)
D024 09	Biotechnological Industries (Acc 3)	1 credit (40 hours)
D025 09	Growing Plants (Acc 3)	1 credit (40 hours)

These Units are based on the three Units available at Intermediate 1, with Outcomes modified to meet the needs of the candidates who may be achieving at Access 3.

In common with Courses, this programme of study includes a further 40 hours over and above the 120 hours of the component Units.

It is envisaged that appropriate groups of candidates can be taught at Intermediate 1 using the content and suggested activities provided in the Intermediate 1 Course Arrangements documents. Candidates can then be assessed to provide evidence of their actual level of achievement, ie to determine whether this is at Intermediate 1 or Access 3.

### *Cluster assessment*

There is no external assessment of the Access 3 Cluster; however, candidates must pass the internal assessments associated with the component Units within the Cluster.

## Intermediate 1 Biology (C007 10)

### *Course outline*

This Course comprises three mandatory Units, as follows:

D023 10	Health and Technology (Int 1)	1 credit (40 hours)
D024 10	Biotechnological Industries (Int 1)	1 credit (40 hours)
D025 10	Growing Plants (Int 1)	1 credit (40 hours)

Intermediate 1 Biology is intended to broaden the experience of science for those candidates not intending to pursue a career in science and it will also allow candidates who do wish to progress in a biology-related occupation to make informed choices. The Course also develops an understanding of the importance of biological issues facing the individual and society. Development of knowledge and understanding, problem solving and practical abilities form the basis of the Course.

### *Course assessment*

To gain the award of the Course, the candidate must pass the internal assessments associated with the component Units. In addition the candidate must meet the standards targeted by the external assessment instrument.

The external assessment instrument is an examination of 1 hour 30 minutes' duration for 75 marks. The examination paper will consist of two sections:

#### *Section A*

This section will contain 25 multiple-choice questions (of these 9–11 will test problem solving and practical abilities). Section A will have an allocation of 25 marks. Candidates will be expected to answer all the questions.

### *Section B*

This section will contain structured questions with an allocation of 50 marks (of these 25–30 marks will test problem solving and practical abilities). Candidates will be expected to answer all the questions.

## **Intermediate 2 Biology (C007 11)**

### *Course outline*

This Course comprises three mandatory Units, as follows:

D026 11	Living Cells (Int 2)	1 credit (40 hours)
D027 11	Environmental Biology and Genetics (Int 2)	1 credit (40 hours)
D028 11	Animal Physiology (Int 2)	1 credit (40 hours)

The Course provides a broad-based, integrated study of the range of biological topics, which are required for progression to the study of Higher Biology or Higher Human Biology, as well as other areas of study or employment. The development of knowledge and understanding, problem solving and practical abilities forms the basis of the Intermediate 2 Course.

### *Course assessment*

To gain the award of the Course, the candidate must pass the internal assessments associated with the component Units. In addition the candidate must meet the standards targeted by the external assessment instrument.

The external assessment instrument is an examination of 2 hours' duration with a total of 100 marks. The examination paper will consist of three sections:

#### *Section A*

This section will contain 25 multiple-choice questions (of these 9–11 will test problem solving and/or practical abilities, the remainder will test knowledge and understanding). Section A will have an allocation of 25 marks. Candidates will be expected to answer all the questions.

#### *Section B*

This section will contain structured questions with an allocation of 65 marks. Between 15 and 20 marks will test problem solving and/or practical abilities, the remainder will test knowledge and understanding. Candidates will be expected to answer all the questions.

#### *Section C*

This section will consist of four extended-response questions to test the candidates' ability to select, organise and present relevant knowledge. Candidates will be expected to answer two of the four questions. Section C will have an allocation of 10 marks (5 marks to each extended response question).

## **Higher Biology (C007 12)**

### *Course outline*

This Course comprises three mandatory Units, as follows:

D029 12	Cell Biology (H)	1 credit (40 hours)
D030 12	Genetics and Adaptation (H)	1 credit (40 hours)
D031 12	Control and Regulation (H)	1 credit (40 hours)

The Course provides a broad-based, integrated study of a wide range of biological topics, which build on the concepts developed in the Standard Grade Biology and Intermediate 2 Biology Courses. The Course content represents major concepts that make biology an important and fundamental area of investigative science and provides a general basis for further study or employment in areas related to biology. The development of knowledge and understanding, problem solving and practical abilities forms the basis of the Higher Course.

### ***Course assessment***

To gain the award of the Course, the candidate must pass the internal assessments associated with the component Units. In addition the candidate must meet the standards targeted by the external assessment instrument.

The external assessment instrument is an examination of 2 hours 30 minutes' duration with a total of 130 marks. The examination paper will consist of three sections:

#### *Section A*

This section will contain 30 multiple-choice questions. Of these, between 9 and 11 questions will test problem solving and/or practical abilities, the remainder will test knowledge and understanding. Section A will have an allocation of 30 marks. Candidates will be expected to answer all the questions.

#### *Section B*

This section will contain structured questions and data handling questions with an allocation of 80 marks. Between 25 and 30 marks will test problem solving and/or practical abilities, the remainder will test knowledge and understanding. Candidates will be expected to answer all the questions.

#### *Section C*

This section will consist of four extended response questions to test the candidates' ability to select, organise and present relevant knowledge. Section C will have an allocation of 20 marks and will include:

- Two structured extended-response questions for 10 marks. Candidates will be expected to answer one of these questions. Marking schemes for these questions will be similar to current practice for essay questions.
- Two open extended-response questions for 10 marks (1 mark for relevance, 1 mark for coherence and 8 marks for knowledge and understanding). Candidates will be expected to answer one of these questions.

## Advanced Higher Biology (C007 13)

### *Course outline*

This Course comprises three mandatory Units and one optional Unit, as follows:

Mandatory Units:

D032 13	Cell and Molecular Biology (AH)	1 credit (40 hours)
D033 13	Environmental Biology (AH)	1 credit (40 hours)
D034 13	Biology Investigation (AH)	0.5 credit (20 hours)

Optional Units:

One selected from:

D035 13	Biotechnology (AH)	0.5 credit (20 hours)
D036 13	Animal Behaviour (AH)	0.5 credit (20 hours)
D037 13	Physiology, Health and Exercise (AH)	0.5 credit (20 hours)

The Course provides a broad-based, integrated study of a wide range of biological topics, which build on the concepts developed in both Higher Biology and Higher Human Biology. The content of the two mandatory Units reflects the importance of cell and molecular biology and environmental biology as fundamental areas of science, which form the basis for study in applied fields of biology. The optional Units provide the opportunity to select an area of study, which could be of economic importance or of intrinsic interest and relevance to the candidate. The investigation is designed to capitalise on the skills that have been developed by the candidate in problem solving and practical abilities to produce an extended piece of scientific work.

### *Course assessment*

To gain the award of the Course, the candidate must pass the internal assessment associated with the component Units. In addition the candidate must meet the standards targeted by the external assessment instruments.

The external assessment instruments are an examination of 2 hours 30 minutes' duration and an investigation report.

### **Examination**

The examination will contribute 80% of the total marks. The examination paper will carry 100 marks in total and will consist of five sections:

#### *Section A*

This section will contain 25 multiple-choice questions based on the two mandatory Units. Of these 8–10 will test problem solving and/or practical abilities, the remainder will test knowledge and understanding. Section A will have an allocation of 25 marks. Candidates will be expected to answer all questions.

#### *Section B*

This section will contain structured questions and data handling questions based on the two mandatory Units with an allocation of 30 marks. Between 17–20 marks will test problem solving and/or practical abilities, the remainder will test knowledge and understanding. Candidates will be expected to answer all the questions.

### *Section C*

This section will consist of four extended-response questions to test the candidate's ability to select, organise and present relevant knowledge. There will be two questions on each of the two mandatory Units. Candidates will be expected to answer one question on each Unit. Section C will have an allocation of 30 marks (15 to each extended response question).

### *Section D*

This section will consist of six extended-response questions to test the candidate's ability to select, organise and present relevant knowledge. There will be two questions on each of the three optional Units. Candidates will be expected to answer one question. Section D will have an allocation of 15 marks.

### **Investigation Report**

The final investigation report will be worth 20% of the total marks. The investigation report will be based on the work carried out in the component Unit *Biology Investigation (AH)*.

A total of 25 marks will be allocated to the investigation report which should be around 2,000 - 2,500 words in length excluding contents pages, indexes, tables, graphs, etc.

The investigation report will be externally assessed using the following assessment categories:

- (a) Introduction (4 marks)
- (b) Procedures (6 marks)
- (c) Results (5 marks)
- (d) Discussion (7 marks)
- (e) Presentation (3 marks)

It is expected that approximately 10 hours of the 'additional 40 hours' will be required for the candidate to complete the report for the course award.

The Investigation report should be submitted to SQA by **30 April**.

### ***Grade***

The grade awarded for the Course will depend on the marks obtained by the candidate (out of 125) for the examination and the investigation report. The certificate will record an award for overall attainment.

## **Higher Human Biology (C009 12)**

### ***Course outline***

This Course comprises three mandatory Units, as follows:

D043 12	Cell Function and Inheritance (H)	1 credit (40 hours)
D044 12	The Continuation of Life (H)	1 credit (40 hours)
D045 12	Behaviour, Populations and the Environment (H)	1 credit (40 hours)

The Course provides a broad-based, integrated study of a range of biological topics, which build on the concepts developed in the Standard Grade Biology and Intermediate 2 Biology Courses. The Course content considers those aspects of biological science, which have more immediate relevance for the biology of the human species and the influence of humankind on the biological world. The development of knowledge and understanding, problem solving and practical abilities forms the basis of the Higher Course.

## ***Course assessment***

To gain the award of the Course, the candidate must pass the internal assessments associated with the component Units. In addition the candidate must meet the standards targeted by the external assessment instrument.

The external assessment instrument is an examination of 2 hours 30 minutes' duration with a total of 130 marks. The examination paper will consist of three sections:

### ***Section A***

This section will contain 30 multiple-choice questions. Between 9 and 11 of these will test problem solving and practical abilities, the remainder will test knowledge and understanding. Section A will have an allocation of 30 marks. Candidates will be expected to answer all the questions.

### ***Section B***

This section will contain structured questions and data handling questions with an allocation of 80 marks. Between 25 and 30 marks will test problem solving and practical abilities, the remainder will test knowledge and understanding. Candidates will be expected to answer all the questions.

### ***Section C***

This section will consist of four extended-response questions to test the candidate's ability to select, organise and present relevant knowledge. Section C will have an allocation of 20 marks and will include:

- Two structured extended-response questions each with an allocation of 10 marks. Candidates will be expected to answer one of these questions. Marking schemes for these questions will be similar to current practice for essay questions.
- Two open extended-response questions for 10 marks (1 mark for relevance, 1 mark for coherence and 8 marks for knowledge and understanding). Candidates will be expected to answer one of these questions.

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