



Higher National Unit specification: general information

Unit title: The Biological Basis of Inheritance

Unit code: H1LH 34

Superclass: RH

Publication date: September 2012

Source: Scottish Qualifications Authority

Version: 01

Unit purpose:

This Unit is designed for candidates progressing to Sport Nutrition, Human Health, Pharmacology or Physiotherapy or a career in Sports Science or Health related professions. The Unit will provide them with an understanding of the main concepts of the structure and function of DNA, the main concepts of inheritance and how these relate to human health and fitness.

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

- 1 Describe DNA structure and replication and the stages of the cell cycle.
- 2 Describe the principles and patterns of inheritance.
- 3 Describe the role of genetics in both illness and health and fitness.

Recommended prior knowledge and skills:

Access to this Unit will be at the discretion of the centre. There are no specific entry requirements; however, it is recommended that candidates should have experience of studying Biology at Intermediate 2.

Credit points and level:

1 Higher National Unit 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.*

General information (cont)

Core Skills:

There may be opportunities to gather evidence towards Core Skills in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

Context for delivery:

This Unit is delivered as part of the Group Award, HND in Sports and Exercise Science, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

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.

Outcome 1

Describe DNA structure and replication and the stages of the cell cycle.

Knowledge and/or Skills

DNA structure.

DNA replication.

The cell cycle including mitosis and meiosis.

Evidence Requirements

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

- ◆ Demonstrate knowledge of components and bonds involved in a DNA double helix.
- ◆ Demonstrate an understanding of the mechanism of semi-conservative replication.
- ◆ Describe the organisation and behaviour of chromosomes during mitosis.
- ◆ Demonstrate an understanding of events which can occur during meiosis to bring about genetic variation.

Evidence could be gathered using a holistic, end of Unit test under closed-book conditions to cover the knowledge and skills for the Outcome.

Assessment Guidelines

This assessment must cover all the knowledge and skills areas. Candidates must achieve all the Evidence Requirements in order to pass this Outcome. Outcomes 1 and 2 may be assessed holistically. The assessment must be closed-book supervised conditions with a cut-off score of 60%.

Outcome 2

Solve problems based on the patterns of inheritance listed in the knowledge and skills for Outcome 2.

Knowledge and/or Skills

- ◆ Mendelian theories and patterns of inheritance.
- ◆ Non-Mendelian patterns of inheritance.
- ◆ Chromosomal basis of sex determination.

Higher National Unit specification: statement of standards (cont)

Unit title: The Biological Basis of Inheritance

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can solve problems based on the patterns of inheritance listed in the knowledge and skills for Outcome 2.

Assessment Guidelines

The assessment must cover all the Knowledge and/or Skills areas. Candidates must achieve all the Evidence Requirements in order to pass the Outcome. Outcomes 1 and 2 may be assessed together written/oral questions, under closed-book supervised conditions with a cut-off score of 60%.

Outcome 3

The role of genetics in both illness and health and fitness.

Knowledge and/or Skills

Describe how genes are expressed.
Biological basis and characteristics of genetic disorders/advantages.

Evidence Requirements

- ◆ Describe the organisation of genes and the control of gene expression in eukaryotic cells.
- ◆ Explain the relationship between genes and inherited disorders/advantages.

Candidates will need to demonstrate their Knowledge and/or Skills by showing that they can:

Produce an investigation and a written report on an inherited trait or disorder which can affect physiological performance.

Assessment Guidelines

This Outcome should be assessed by the production of one report on an inherited trait or disorder that can affect physiological performance. The report should be approximately 1000 words.

Higher National Unit specification: support notes

Unit title: The Biological Basis of Inheritance

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 is intended to provide knowledge of the biological basis of inheritance that will help to prepare candidates articulating to courses such as Sport Nutrition, Human Health or Physiotherapy or who propose to pursue a career in a sport or health related area.

Centres should aim to relate the underpinning knowledge to applications in the field of Sport and Exercise.

Guidance on the delivery and assessment of this Unit

This Unit is primarily intended to provide candidates studying for the Group Award in Sport and Exercise Science, with a fundamental understanding of biological basis for inheritance from a molecular to phenotypic level and the role played by genetics in human health. This Unit will provide knowledge essential to the understanding of subsequent genetic and molecular studies by candidates and in the part played by molecular genetics in human health and performance.

Online and Distance Learning

If this Unit is delivered by open or distance learning methods, additional planning resources may be required for candidate support, assessment and quantity assurance. A combination of new and traditional authentication tools may have to be devised for assessment and reassessment purposes.

Opportunities for developing Core Skills

An opportunity to gather evidence towards IT and Communications Core Skills may be gathered from the LO3 report and problem solving from LO2.

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements

History of changes to Unit

Version	Description of change	Date

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Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Business Development and Customer Support team, telephone 0303 333 0330.

General information for candidates

Unit title: The Biological Basis of Inheritance

This Unit is intended for delivery as part of the Sport and Exercise Science Group Award at HND level.

Outcome 1 will look at DNA and the molecular basis for inheritance

Outcome 2 will investigate patterns of inheritance

Outcome 3 will look at role of genetics in both illness and health and fitness

Outcomes 1 and 2 will be assessed by means of end of Unit assessment. Outcome 3 will be assessed by production of a report.