## Higher National Unit specification: general information

**Unit title:** Anatomy, Physiology and Energy Systems

**Unit code:** FW5P 34

**Superclass:** RH

**Publication date:** October 2011

**Source:** Scottish Qualifications Authority

**Version:** 01

## Unit purpose

This Unit introduces candidates to the broad nature of Anatomy and Physiology within the context of sport. It also introduces candidates to the importance of the structure and function of the body systems.

On completion of this Unit, the candidate will be able to:

1 Describe the structure and function of the skeletal and muscular systems.
2 Describe the structure and function of the respiratory and cardiovascular systems.
3 Describe the structure and function of the energy systems.

## Recommended prior knowledge and skills

Knowledge, Skills and/or experience relevant to the Unit would be beneficial.

It would be beneficial if the candidate had achieved an SQA Unit on *Anatomy and Physiology* at SCQF level 6 level prior to attempting this Unit. Ultimately entry is at the discretion of the centre.

## 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 are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this 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. This Unit is included in the framework for HNC/HND Coaching and Developing Sport.

## Assessment

The Unit may be assessed by one instrument of assessment covering all Unit Outcomes. This will take the form of restricted response assessments. These will be conducted under supervision. An exemplar instrument of assessment and marking guidelines has been produced to indicate the national standard of achievement required at SCQF level 7. It would also be possible to assess each Outcome discretely using the same assessment instruments.

## Higher National Unit specification: statement of standards

## Unit title: Anatomy, Physiology and Energy Systems

## Unit code: FW5P 34

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 structure and function of the skeletal and muscular systems.

### Knowledge and/or Skills

- Skeletal system
- Muscular system

### Evidence Requirements

The candidate will be set a series of questions for each of the systems which ensure that the Knowledge and Skills are addressed.

To achieve this Outcome each candidate will require written evidence to demonstrate their understanding on all aspects of the Knowledge and/or Skills section. Each candidate will be required to describe the structure and function of both body systems.

### Assessment Guidelines

Candidates would be required to produce accurate written responses that demonstrate their understanding of the structure and function of these systems.

## Outcome 2

Describe the structure and function of the respiratory and cardiovascular systems.

### Knowledge and/or Skills

- Respiratory system
- Cardiovascular system

### Evidence Requirements

The candidate will be set a series of questions for each of the systems which ensure that the knowledge and skills are addressed.

To achieve this Outcome each candidate will require written evidence to demonstrate their understanding on all aspects of the Knowledge and/or Skills section. Each candidate will be required to describe the structure and function of both body systems.

### Assessment Guidelines

Candidates would be required to produce accurate written responses that demonstrate their understanding of the structure and function of these systems.

## Outcome 3

Describe the structure and function of the energy systems.

### Knowledge and/or Skills

Energy systems:

- aerobic
- anaerobic

### Evidence Requirements

The candidate will be set a series of questions for each of the systems which ensure that the knowledge and skills are addressed.

To achieve this Outcome each candidate will require written evidence to demonstrate their understanding on all aspects of the Knowledge and/or Skills section. Each candidate will be required to describe the structure and function of the energy systems.

### Assessment Guidelines

Candidates would be required to produce accurate written responses that demonstrate their understanding of the structure and function of the energy systems.

## Higher National Unit specification: support notes

## Unit title: Anatomy, Physiology and Energy Systems

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

The Unit is likely to form part of a Group Award and is primarily designed to provide candidates with knowledge of the broad nature of the structure and function of the main body systems and the short term effects of exercise on the body. It is therefore likely that the Unit will be delivered early in year one of an HNC award as it may well underpin much of the work of that award.

Candidates will develop their own knowledge on the main structures of the body and the short term effects of exercise. It will be appreciated that in some areas of this knowledge, there are various views and opinions and it is appropriate to allow that position to be taken as far as opinion is concerned. The science behind the theories continues to develop and views may change as long as they are supported by facts.

## Guidance on the delivery and assessment of this Unit

The Unit is likely to form part of a Group Award and is primarily designed to provide candidates with knowledge of the broad nature of the structure and function of the main body systems. It is therefore likely that the Unit will be delivered early in year one of an HNC award.

**Outcome 1**

Skeletal System:

- axial and appendicular skeleton
- bone tissue development (ossification process, growth plates).
- joints — type, classification and structure
- terminology of movement

Muscular System:

- structure of skeletal muscle —fibres bundles, origins and insertions
- different types of muscle — skeletal, smooth, cardiac
- function of skeletal muscle
- muscular action — eccentric, concentric, isometric
- sliding filament theory

## Higher National Unit specification: support notes (cont)

## Unit title: Anatomy, Physiology and Energy Systems

**Outcome 2**

Respiratory System:

- anatomy — oral/nasal cavity, trachea, bronchus, bronchioles, alveoli
- mechanics of breathing — diaphragm, intercostals muscles, plural membrane
- gaseous exchange, diffusion, delivery of oxygen, removal of carbon dioxide
- exchange of air volumes — tidal volume, residual volume, vital capacity, total lung volume, expiratory reserve

Cardiovascular System:

- structure — atrium, ventricles, valves, septum, aorta, superior/inferior vena cava, blood vessels
- structure and function of the vascular system
- redistribution of blood flow — vasodilation/vasoconstriction

**Outcome 3**

Energy Systems

- aerobic — oxidation of foods ie fats,carbohydrate, protein
- anaerobic — adenosine tri-phosphate(ATP), creatine phosphate(CP)

Outcomes 1, 2 and 3:

- assessment may be undertaken when appropriate at the discretion of the centre. It is likely that for many candidates, much of this may be new material and may involve new concepts. Outcomes may be integrated or delivered discretely and assessed together or separately

## Open learning

Centres may consider that this Unit presents many opportunities for this route of delivery as much of the work is based on established facts on theories.

Candidates may learn and then present assessments in the way the centre considers to be appropriate as long as procedures are in place to ensure the authenticity of asssessments.

## Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003), SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

## Higher National Unit specification: support notes (cont)

**Unit title:** Anatomy, Physiology and Energy Systems

## Opportunities for developing Core Skills

Candidates may acquire skills in *ICT, Communication* and *Problem Solving*. Candidates may develop skills in *Problem Solving* and *Communication* depending on how the candidate develops their knowledge. Candidates using book based material will develop skills in these aspects while candidates making full use of electronic resources will acquire skills in ICT. Many candidates may well use both methods of study. Candidates may also have additional opportunities to develop skills in problem solving where they are required to consider different views on some aspect of the science behind current views.

## 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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## General information for candidates

## Unit title: Anatomy, Physiology and Energy Systems

This Unit introduces you to the main body systems and will give you an understanding of the structure and function of these systems and will help inform your future development as a coach or development officer. The competences developed will underpin much of the knowledge you will require to develop as a coach.

On completion of this Unit you will be able to describe the structure and function of the main body systems.

All Outcomes will be assessed using restricted response questions. All assessments will be done under supervised conditions.