

National Unit Specification: General Information

UNIT	Human Physiology in the Development of Performance (Higher)
NUMBER	D681 12
COURSE	This is a free standing unit that may be used as part of a Scottish Group Award or be associated with other programmes of study in schools, colleges of further education or other centres.

SUMMARY

This unit is designed to enable candidates to develop their understanding of the basic anatomical and physiological principles which underlie human performance in a sporting or dance related activity leading to the production of an extended training programme for a single participant.

OUTCOMES

- 1 Explain the structure and function of the skeletal and muscular systems.
- 2 Explain the structure and function of the cardio-respiratory and energy systems.
- 3 Explain the adaptations that take place within the skeletal, muscular, cardio-respiratory and energy systems as a result of sporting or dance related training.
- 4 Design an extended performance related physical training programme for a participant.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates may find it advantageous to have attained D684 11 Physiology in the Development of Performance: An Introduction (Intermediate 2) or a Credit level award in Standard Grade Science, plus one or more of the following:

- a Credit level award in Standard Grade Physical Education
- a unit, units or course in Physical Education at Intermediate 2
- relevant sporting activity or dance units at Intermediate 2
- other relevant prior experience in physical education or dance, including experience gained outwith certificated courses.

Administrative Information

Superclass:	MA
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CREDIT VALUE

1 credit at Higher.

CORE SKILLS

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills in National Qualifications* (SQA, 1999).

National unit specification: statement of standards

UNIT Human Physiology in the Development of Performance (Higher)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

OUTCOME 1

Explain the structure and function of the skeletal and muscular systems.

Performance Criteria

- a) The anatomical names of the main bones which make up the skeletal system are correctly identified.
- b) The structure of a long bone is accurately described.
- c) The anatomical names for the main muscles which make up the muscular system are correctly identified.
- d) The structure of skeletal muscle is accurately described.
- e) The structure and function of a synovial joint is accurately described.

Evidence Requirements

Oral or written evidence that the anatomical names of the main bones and muscles of the skeletal and muscular systems are correctly identified.

Oral or written evidence that the structure of a long bone, skeletal muscle and synovial joint, and the function of a synovial joint is accurately described.

OUTCOME 2

Explain the structure and functions of the cardio-respiratory and energy systems.

Performance Criteria

- a) The structure of the main components of the cardio-respiratory system is correctly described.
- b) The functions of the main components of the cardio-respiratory system are accurately described.
- c) The functions of the three energy systems is correctly outlined.
- d) The relationship between the cardio-respiratory system and the three energy systems is accurately explained.

Note on range for the outcome

Energy systems: aerobic glycolysis system; anaerobic glycolysis system; phosphocreatine system.

Evidence Requirements

Oral or written evidence that the candidate can describe the structure and functions of the main components of the cardio-respiratory system.

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Oral or written evidence that the candidate can outline the functions of the three energy systems.

Oral or written evidence that the candidate can explain the relationship between the cardio-respiratory system and the three energy systems.

OUTCOME 3

Explain the adaptations that take place within the skeletal, muscular, cardio-respiratory and energy systems as a result of sporting or dance related training.

Performance Criteria

- a) The adaptations that take place within the skeletal system as a result of sporting or dance related training are correctly explained.
- b) The adaptations that take place within the muscular system as a result of sporting or dance related training are correctly explained.
- c) The adaptations that take place within the cardio-respiratory system as a result of sporting or dance related training are correctly explained.
- d) The adaptations that take place within the energy systems as a result of sporting or dance related training are correctly explained.

Evidence Requirements

Oral or written evidence that the candidate correctly explains the adaptations that take place in the skeletal, muscular, cardio-respiratory and energy systems as a result of sporting or dance related training.

OUTCOME 4

Design an extended performance related physical training programme for a participant.

Performance Criteria

- a) The methods used to evaluate fitness is relevant to the participant and the sporting or dance related activity.
- b) The principles of specificity and progressive overload are applied with due consideration to the participant and the training and competition demands of the sport or dance related activity.

Note on range for the outcome.

Fitness: pre-activity; post-activity.

Evidence Requirements

Evidence of production of a training programme covering a minimum period of eight weeks.

National unit specification: support notes

UNIT Human Physiology in the Development of Performance (Higher)

This part of the unit specification is offered as guidance. None of the sections of the support notes is 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 CONTENT AND CONTEXT

Candidates will be given the opportunity to develop their knowledge and understanding of anatomical and physiological principles. These principles will be presented in the context of recognised anatomical and physiological terminology (eg, a candidate will be expected to refer to the anatomical names of the four muscles which collectively make up the quadriceps muscle group on the front of the thigh). This greater insight into the two areas will enable the candidate to make a detailed analysis of the contribution of the fitness components necessary to bring about an improvement in performance in a sporting or dance related activity. The unit focuses on improving performance in a sporting or dance related activity of the candidate's choice, within the context of an extended training programme for a participant.

The programme should take into account the fitness components necessary to bring about improvement in performance in the chosen sporting or dance related activity. The programme should also take into consideration the principles of specificity and progressive overload in its design.

GUIDANCE ON TEACHING AND LEARNING APPROACHES

Candidates should be provided with the opportunity to further develop their knowledge, understanding and analytical ability through a variety of learning and teaching approaches including lectures, demonstrations and practical exercises. In view of the practical nature of the subject matter, candidates should be encouraged to work as individuals, in pairs, and small groups in a practical context where applicable. A variety of methods for the analysis of performance should be presented to the candidate, including the use of video and peer group observation/assessment.

GUIDANCE ON APPROACHES TO ASSESSMENT

To achieve this unit, evidence requires to be generated which confirms that the candidate has successfully achieved all outcomes and performance criteria within any range specified. The following outlines how evidence could be generated:

Outcome 1

Written or oral questions relating to the anatomical names given to the main bones and muscles of the skeletal and muscular systems respectively (performance criteria (a) and (c)).

Written or oral questions relating to the structure of a long bone and skeletal muscle and the structure and function of a synovial joint (performance criteria (b), (d) and (e)).

National unit specification: support notes (cont)

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Outcome 2

Written or oral questions relating to the structure and functions of the main components of the cardio-respiratory system (performance criteria (a) and (b)).

Written or oral questions relating to the functions of the three energy systems (performance criterion (c)).

Written or oral questions relating to the relationship between the cardio-respiratory system and three energy systems (performance criterion (d)).

Outcome 3

Written or oral questions relating to the adaptations that take place in the skeletal, muscular, cardio-respiratory and energy systems as a result of sporting or dance related training.

Outcome 4

An assignment where the candidate produces an extended training programme for a minimum eight weeks period which takes into consideration the principles of specificity and progressive overload in relation to the relevant components of fitness for the chosen sport or dance related activity. The programme should also take into account the ability of the participant as well as the training and competition demands of the sport or dance related activity.

Note: in the case of oral evidence, this must be retained in a format which can be produced as evidence of candidate achievement.

EXEMPLAR

Outcome 4, performance criterion (a)

ASSIGNMENT

Prepare a plan of an extended training programme for a participant in a sporting or dance related activity of your choice.

For the purpose of this assignment the participant in question is training twice per week and performing on either a Saturday or Sunday. The participant is also performing at representative level ie, for the District, Region or National squad. He/she is therefore of a high standard.

National unit specification: support notes (cont)

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When designing your training programme you should take note of the following points:

- a) The age and sex of the participant should be stated.
- b) The sporting or dance related activity in which the participant is involved should be identified.
- c) The components of fitness relevant to the chosen sporting or dance related activity should be identified.
- d) The training programme should be designed to last for a minimum of eight weeks. There is no maximum.
- e) The programme should show evidence of consideration of the principle of specificity by referring to the participant's level of fitness at the beginning of the programme.
- f) The programme should show how the frequency, intensity and duration of each exercise have been established to bring about a progressive training overload within the overall programme.
- g) The method of evaluating the improvements gained as a result of the programme should be clearly identified.

SPECIAL NEEDS

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements* (SQA, 1998).