



Accredited

# OCR LEVEL 2 CAMBRIDGE TECHNICAL CERTIFICATE/DIPLOMA IN SPORT

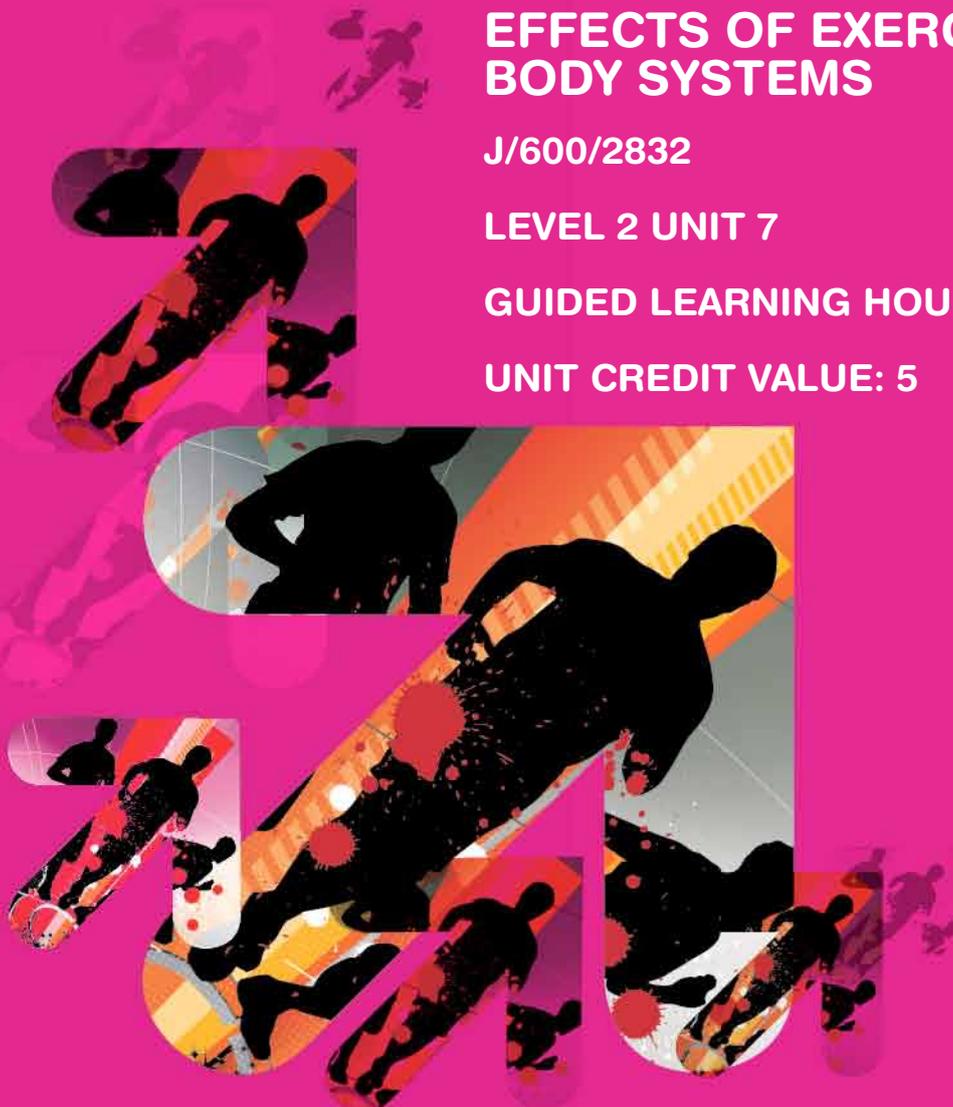
## EFFECTS OF EXERCISE ON THE BODY SYSTEMS

J/600/2832

LEVEL 2 UNIT 7

GUIDED LEARNING HOURS: 30

UNIT CREDIT VALUE: 5



# EFFECTS OF EXERCISE ON THE BODY SYSTEMS

J/600/2832

LEVEL 2

## AIM OF THE UNIT

Many careers within the sport, leisure and health industries require employees to have an understanding of how the body changes and responds to physical activity. With this knowledge it is then possible to improve and develop body systems to optimise sports performance and improve lifestyle and health.

## PURPOSE OF THE UNIT

By completing this unit learners will have an understanding on the changes of the body systems during short term and long term exercise, aerobic and anaerobic energy production. Also the role of drugs in enhancing sports performance and the negative effects they will have on an athlete.

## ASSESSMENT AND GRADING CRITERIA

| <b>Learning Outcome (LO)</b>  | <b>Pass</b>  | <b>Merit</b>  | <b>Distinction</b>   |
|---|--|---|--|
| The learner will:   | The learner can:   | To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to: | To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:  |
| 1 Be able to investigate the short-term effects of exercise on the body systems | P1 describe the short-term effects of exercise on the musculoskeletal, cardiovascular and respiratory systems                        | M1 measure short-term effects of exercise on the musculoskeletal, cardiovascular and respiratory systems  | D1 measure the short term effects of exercise, making reference to how these contribute to the long term effects of exercise and the performance of the aerobic and anaerobic energy systems |
|   | P2 investigate the short term effects of exercise on the musculoskeletal, cardiovascular and respiratory systems, with tutor support |   |  |
| 2 Know the long-term effects of exercise on the body systems                    | P3 describe the long-term effects of exercise on the musculoskeletal system  |   |  |
|   | P4 describe the long-term effects of exercise on the cardio-respiratory system   |   |  |
| 3 Be able to investigate the fundamentals of the energy systems                 | P5 describe two types of physical activity that use the aerobic energy system and two that use the anaerobic energy systems.         | M2 analyse the use of the aerobic and anaerobic systems in a range of practical game situations           |  |
|   | P6 investigate different physical activities that use the aerobic and anaerobic energy systems with tutor support                    |   |  |
| 4 Know the impact of drugs on sports performance                                | P7 describe four different types of drugs used to enhance sport performance and their effects  | M3 identify a specific incident involving drug taking and its impact on sports performance.               | D2 identify potential impacts of drugs on body systems   |
|   | P8 describe the negative impact of drugs   |   |  |

## TEACHING CONTENT

The unit content describes what has to be taught to ensure that learners are able to access the highest grade.

Anything which follows an i.e. details what must be taught as part of that area of content.

Anything which follows an e.g. is illustrative, it should be noted that where e.g. is used, learners must know and be able to apply relevant examples to their work though these do not need to be the same ones specified in the unit content.

### **LO1 Be able to investigate the short-term effects of exercise on the body systems**

*Short term effects:* i.e. changes in the range of movement around joints (e.g. before and after an aerobics class); changes in heart rate (e.g. before and after swimming); changes to breathing rate (e.g. before and after a running activity); changes in temperature (e.g. before and after a tennis session); muscle fatigue (e.g. after a fitness work out in the gym).

*Measurement:* (e.g. heart rate monitor, pulse rate, blood pressure, sit and reach test, spirometer).

### **LO2 Know the long-term effects of exercise on the body systems**

*Long term effects:* (e.g. muscle size and strength, resting heart rate, training heart rate, flexibility, reduction in muscle soreness following exercise, increased lung capacity).

### **LO3 Be able to investigate the fundamentals of the energy systems**

*Energy systems:* i.e. anaerobic energy system; aerobic energy system.

*Physical activity:* (e.g. sprinting, marathon running, cycling, rugby, weight-lifting).

*Practical game situation:* (e.g. football match, 200m race, netball match), range is more than 2.

### **LO4 Know the impact of drugs on sports performance**

*Types of drugs:* (e.g. anabolic steroids, erythropoietin (EPO), growth hormone, amphetamines, diuretics, beta blockers, recreational drugs (e.g. cocaine); blood doping).

*Effect on sports performance:* (e.g. increase speed, reduction in heart rate, increase stamina, increase strength, weight loss, increased alertness).

*Negative impact of drugs:* i.e. harmful effects on the body (e.g. infertility, cancer, aggression, addiction); on sport (e.g. bans, loss of reputation).

## DELIVERY GUIDANCE

This unit is centre-assessed and externally moderated. In order to achieve this unit the learner must produce a portfolio of evidence showing that they can meet all of the assessment objectives.

Portfolios of work must be produced independently.

Learners should underpin theoretical knowledge with practical activity in order to be able to identify situations where key components are in action.

The required anatomical and physiological information relating to this unit can be studied within textbooks, DVD's, and various websites as well as by undertaking specific practical exercises.

The unit allows tutors to introduce learners to the principles of training and therefore has the opportunity for large amounts of practical work.

**LO1** Tutors will explain and set up a series of activities which learners can undertake or observe, to measure short term effects of exercise on body systems. These could include a range of recognised tests (e.g. sit and reach test, Harvard step test, Illinois agility test, cooper test, bleep test) and/or a variety of different sports options. Learners are expected to be able to record heart rates, breathing rates, temperature changes and muscle fatigue.

Tutors will guide learners in the recording of pre and post activity results (e.g. using a spreadsheet). Tutors will help learners to review and analyse results e.g. by modelling examples. Learners are subsequently expected to research information and independently review their own findings.

**LO2** Tutors will guide learners to extend the range of personal data collected in LO1 in order to illustrate long term effects of activity (e.g. strength tests, training zone heart rate, speed and agility, resting heart rate, lung capacity).

Tutors will set up and monitor regular practical opportunities for learners to participate in a long term series of appropriate activity e.g. a minimum of one 50 minute session per week for a 6-10 week period (e.g. circuit training, swimming, cycling, football, netball, squash). This could be undertaken either in school or during an out of school club. Tutors will direct learners to keep a log which will detail pre and post programme results and include a record of activities undertaken each session. Tutors will help learners to review

and analyse results (e.g. by modelling examples). Learners are then expected to research information and independently review their own findings.

**LO3** Tutors will guide learners to the two different types of energy systems, this could be theory based and linked to practical activities when linking to sporting activities. For the merit criteria a range is more than two.

**LO4** Learners should be able to explain the reasons why certain drugs are used in sport, in terms of intended benefit and how the drug works. They should also appreciate the negative impact of drugs on the body and on the sport.

## GUIDANCE ON ASSESSING THE SUGGESTED TASKS

The table below shows suggested scenarios that cover the pass, merit and distinction criteria in the assessment and grading grid.

You have applied for an 'Assistant Coach' job in a sports centre. You have been offered a trial period and must show your understanding of the effect of exercise on the body systems. You will be expected to be confident in answering questions regarding the key features of the short and long-term effects of exercise on the body. You will also need to have an understanding of the energy systems in the body and drugs in sport.

| Criteria    | Assignment title                             | Scenario   | Assessment  |
|-------------|--|--|---|
| LO1 and LO2 | Short term and long term effects of exercise | <p>You have been successful in your application for the role of assistant coach and have been asked to start on a trial basis. During your trial you have to demonstrate an understanding of the effects that physical activity has on the body, This needs to include both the short-term and long-term effects so you decide to monitor a new member to the sports centre. You will record the short-term effects of each session the member participates in, looking at areas including:</p> <ul style="list-style-type: none"> <li>• range of movement</li> <li>• heart rate</li> <li>• breathing rate</li> <li>• temperature</li> <li>• muscle fatigue.</li> </ul> <p>You will then monitor these areas over time to record the long-term effects of physical activity including:</p> <ul style="list-style-type: none"> <li>• muscle size and strength</li> <li>• resting heart rate</li> <li>• training heart rate</li> <li>• flexibility</li> <li>• reduction in muscle soreness</li> <li>• increased lung capacity.</li> </ul> <p>You then need to provide a written review explaining the short-term effects and the long-term effects of physical activity.</p> | Evidence for this task could include a log of pre and post programme measurements, a witness statement from tutor or outside coach to evidence participation and understanding of long-term changes. Learners will also be required to produce a written review to explain adaptations. |

|     |                |   |   |
|-----|----------------|---|---|
| LO3 | Energy Systems | The senior coach has asked you to write a report describing the different types of energy systems (anaerobic and aerobic) used during sport. Also, you need to demonstrate or take part in physical activities which use these different types of energy systems. | Learner produces a report on the different energy systems. This can be linked to the activities performed in LO1 and LO2. A witness statement and a report could be included indicating learners have taken part in different activities. |
| LO4 | Drugs in Sport | The senior coach has asked you to put together a presentation that will educate the younger athletes on the impact of drugs on sports performance - discussing their effects and negative impact  | Learner produces a PowerPoint presentation detailing the effects of drugs and their negative impacts.   |

## RESOURCES

### Websites

American College of Sports Medicine.

URL:<http://www.acsm.org>

Coachwise 1st4sport. URL:<http://www.1st4sport.com>

Coachwise 1st4sport is a specialist publisher, mail order catalogue and e-commerce site of sports books, videos, training tools, coaching aids and sports-related software.

Institute of Leisure and Amenity Management.

URL: <http://www.ilam.co.uk>

Sports Coach UK. URL:<http://www.sportscoachuk.org>

Links for coaching contact information/fact sheets and resources for coaches

St. John Ambulance. URL:<http://www.sja.org.uk>

YMCA Fitness Industry Training.

URL:<http://www.ymcafit.org.uk>

A virtual sport injury clinic, includes information on sport injuries and rehabilitation

URL:<http://www.sportinjuryclinic.net>

## MAPPING WITHIN THE QUALIFICATION TO THE OTHER UNITS

**Unit 1:** Anatomy and Physiology for Sport

**Unit 4:** Nutrition for Sports Performance



## **CONTACT US**

Staff at the OCR Customer Contact Centre are available to take your call between 8am and 5.30pm, Monday to Friday.

We're always delighted to answer questions and give advice.

**Telephone 02476 851509**

**Email [cambridgetechnicals@ocr.org.uk](mailto:cambridgetechnicals@ocr.org.uk)**

**[www.ocr.org.uk](http://www.ocr.org.uk)**