



Accredited

OCR LEVEL 3 CAMBRIDGE TECHNICAL CERTIFICATE/DIPLOMA IN SPORT

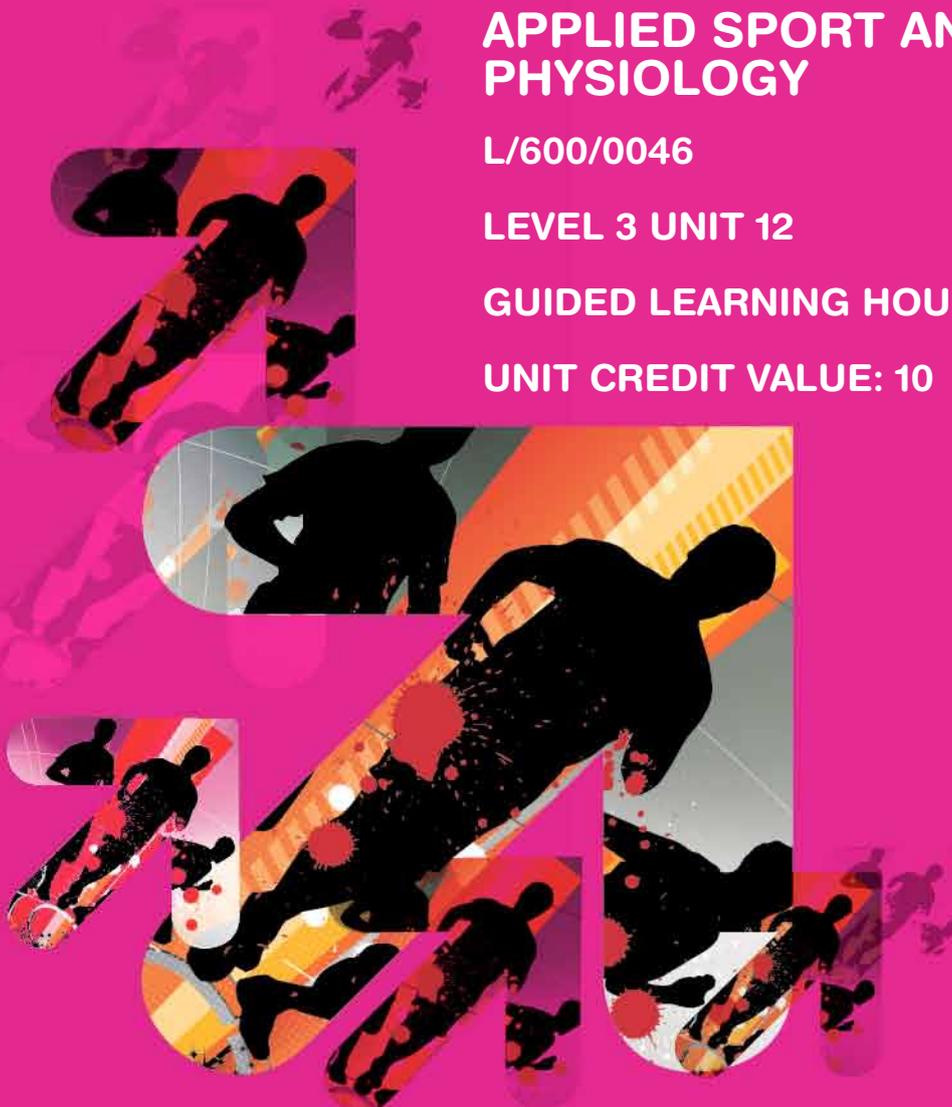
**APPLIED SPORT AND EXERCISE
PHYSIOLOGY**

L/600/0046

LEVEL 3 UNIT 12

GUIDED LEARNING HOURS: 60

UNIT CREDIT VALUE: 10



APPLIED SPORT AND EXERCISE PHYSIOLOGY

L/600/0046

LEVEL 3

AIM OF THE UNIT

Athletes have to compete in different environments (hot/cold, wet/dry), therefore, it is important to understand how the body responds to these different environments for the athlete to perform efficiently. Athletes also have to compete all around the world, so events may occur at high altitude. The changes in the athletes' performance at high altitude became apparent in the 1968 Olympic Games in Mexico City where it was a performance reducer for endurance athletes, but the thin air contributed to many record-setting jumps, leaps, vaults, and throws.

Coaches have to understand how a person's race, gender and age may affect their training needs, ability and requirements and make changes to training programmes if necessary. Ergogenic aids are any external influences that can be determined to enhance performance, although some of these aids are against sporting regulations and if athletes are caught using them it can have serious consequences.

PURPOSE OF THE UNIT

By completing this unit learners will have an understanding of environmental factors (climate and altitude), they will then look at the individual factors of age, race and gender. Ergogenic aids are also covered, looking at both legal and illegal substances. The effects and implications of taking these aids are investigated.

ASSESSMENT AND GRADING CRITERIA

Learning Outcome (LO) The learner will:	Pass The assessment criteria are the pass requirements for this unit. The learner can:	Merit To achieve a merit the evidence must show that, in addition to the pass criteria, the learner is able to:	Distinction To achieve a distinction the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
1 Know how temperature and altitude affect exercise and sports performance	P1 describe the responses of the body to temperature, and their effects on exercise and sports performance P2 describe the responses of the body to high altitude, and their effects on exercise and sports performance		D1 compare the performance of elite athletes from different gender, racial and geographic groups
2 Know about the physical differences between people of different gender and race and their affect on exercise and sports performance	P3 describe the physiological differences between athletes of different gender, and their effects on exercise and sports performance P4 describe the physiological differences between athletes of different race, and their effects on exercise and sports performance	M1 give examples of where race and gender has had a potential impact in sports events	
3 Know the impact that the physiological effects of ageing have on exercise and sports performance	P5 describe the impact of the physiological effects of ageing on exercise and sports performance	M2 give examples of where ageing has impacted the performance of an elite athlete	
4 Know the effects and implications of using ergogenic aids for exercise and sports performance	P6 describe the effects and implications of six different ergogenic aids used for exercise and sports performance	M3 give examples of ergogenic aids which may be beneficial in a specific sport	D2 classify a range of ergogenic aids using the following headings: <ul style="list-style-type: none"> • mechanical Aids • physiological Aids • psychological Aids • nutritional Aids • pharmacological Aids

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 Know how temperature and altitude affect exercise and sports performance

Temperature: i.e. responses of body to high temperature (e.g. sweating, methods of heat loss); effects of high temperature (e.g. hyperthermia, dehydration); effects of high temperature on sports performance; responses of body to low temperature (e.g. shivering, vascular adjustments); effects of low temperature (e.g. hypothermia); effects of low temperature on sports performance.

Altitude: i.e. immediate response to altitude (e.g. hyperventilation, cardiovascular changes, hematologic changes), long term adjustment to altitude training (e.g. hyperventilation, cardiovascular changes, hematologic changes) differences between training at sea level and at altitude.

LO2 Know about the physical differences between people of different gender and race and their affect on exercise and sports performance

Gender: i.e. physical differences (e.g. body size, body fat, muscle mass, hormonal levels, haemoglobin levels, thermoregulation, heart size, flexibility, training differences); effects (e.g. recovery periods, anaerobic capacity, aerobic capacity).

Race: (e.g. African origin, Caucasian, Asian); physical differences (e.g. muscle fibre types, body fat, lung capacity, haemoglobin levels, body type); effects (e.g. cold and heat tolerance, sprinting ability, high-altitude tolerance).

LO3 Know the impact that the physiological effects of ageing have on exercise and sports Performance

Physiological effects of ageing: (e.g. maximum heart rate, lung volumes, strength changes, flexibility).

Impact: (e.g. training, recovery periods, aerobic and anaerobic capacity).

LO4 Know the effects and implications of using ergogenic aids for exercise and sports performance

Ergogenic aids: i.e. types of ergogenic aids: pharmacological agents, hormonal agents, physiological agents, nutritional ergogenics (e.g. anabolic steroids, growth hormone, creatine, insulin, caffeine, blood doping, erythropoietin (EPO), altitude training, glycogen loading, beta blockers, amphetamines, cocaine).

Positive effects: (e.g. decreased recovery time, increased mobilisation of fatty acids; decreased heart rate).

Negative effects: (e.g. heart palpitations, reduced fertility, cancer, skin disorders, increased blood pressure, muscle cramp, kidney problems).

DELIVERY GUIDANCE

Learners should be encouraged to develop their skills in assessing the needs of an athlete and recommending a range of strategies to optimise performance and discussing gender, race and age aspects visiting speakers/guest lecturers from a local HE institute would help enhance this unit.

The assessment criteria for this unit could ideally be met by adopting a case study approach. Learners could assess the needs of different performers from different sports.

Learners may provide portfolio evidence for the assessment criteria of this unit using a range of presentation techniques. This may include written work, the use of video, audio tapes, presentations and assessor testimony/witness statements (if appropriate).

LO1: Learners could investigate how temperature and altitude effects sports performance from both a practical and theoretical approach. Learners could investigate the 1968 Olympic Games and compare endurance and track and field event results to other Olympic Games. Learners could investigate the theory on how different temperatures affect sports performance. A practical session could be added comparing performing physical activity at different temperature. Or a visit could be made to a local HE institute with an environmental chamber.

LO2: Learners need to know the physiological differences between different genders. A comparison can be made if a mixed gender class is present. Also looking at world records comparing male and females. Learners need to investigate race and the effects this has on sports performance, learners can look at sprint times, swimming times, and weight lifting and discuss how race might have an effect on sporting performance.

LO3: Learners should look at a range of ages (children, teenagers, adults, and adults over 60) and discuss how this will have an effect on sport and exercise performance. This could be performed as a case study

LO4: Learners need to look at the different types of ergogenic aids and how they might enhance sport performance. Learners can use case studies or investigate recent athletes who have been banned from sport for using illegal aids. For the distinction criteria a range is more than two.

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.

Criteria	Assignment title	Scenario	Assessment
P1	Temperature and Altitude	You have the opportunity to attend a training camp abroad. You want to research the body's response to training at different temperatures and different altitudes	Learners can present this in a variety of formats – written report, poster, leaflets.
P2, M1 and D1	Gender and Race	You have been asked to put a presentation together "Showing the physical differences between people of different gender and race and their affect on exercise and sports performance"	Learners need to produce a PowerPoint presentation.
P3 and M2	Aging	Looking at how individuals age from a child to over 60, discuss how aging can have an impact on sport and exercise performance	Learners can present this in a variety of formats.
P4, M3 and D2	Erogenic Aids	You have been approached by a local academy squad to produce a leaflet for their young athletes to educate them on the impact of erogenic aids and their impact on sports performance	Learners need to produce a leaflet.

RESOURCES

Books

Cross, N., Lyle, J. (1999) *The Coaching Process: Principles and Practice for Sport* (Paperback Butterworth-Heinemann Ltd

Foran, B. (2000) *High-Performance Sports Conditioning* Human Kinetics Europe Ltd

Galvin, B., Ledger, P. (2004) *A Guide to Planning Coaching Programmes* Sports coach UK

Noakes, T., Hawley, J., Burke, L (1998) *Peak Performance: Training and Nutritional Strategies for Sport* Allen & Unwin

DVDs/Videos

Pushing the Limits in Athletic Performance DVD (2002). Video Education Australasia (available from Coachwise)

Recovery from Exercise DVD (2003). Video Education Australasia (available from Coachwise)

Training Strategies DVD (2003). Video Education Australasia (available from Coachwise)

Journals/magazines/booklets/brochures

sports coach UK. *coaching edge Magazine*

coaching edge is produced quarterly and includes top coaches outlining their innovative coaching methods, tried and tested theories to improve coaching, how sports science can really make a difference, well presented technical information with something for every coach or sports enthusiast no matter what their level of experience.

UK Sport. *Performance*

UK Sport's regular publication aimed at the elite sport community. The magazine includes news and features on the latest issues impacting on high-performance sport in the UK.

Websites

BBC Sport Academy. URL:<http://news.bbc.co.uk/sportacademy>
Advice on technique for different sports.

English Institute of Sport. URL:<http://www.eis2win.co.uk>

This website has information on applied physiology, biomechanics, medical consultation, medical screening, nutritional advice, performance analysis, psychology, podiatry, strength and conditioning coaching, sports massage and sports vision.

Peak Performance online. URL:<http://www.pponline.co.uk/>

Peak Performance is a subscription-only newsletter for athletes and coaches, featuring the latest research from the sports science world.

scenta (science, engineering and technology). URL:<http://www.scenta.co.uk/sport.cfm>

This website has an excellent section on sports technology news and features.

Sports Coach. URL:<http://www.brianmac.demon.co.uk>

Provides information on a range of topics related to developing athletic ability and coaching expertise.

sports coach UK. URL:<http://www.sportscoachuk.org>

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

The Gatorade Sports Science Institute. URL:<http://www.gssiweb.com/>

GSSI staff scientists study the effects of exercise, the environment and nutrition on the human body using the latest scientific technology and equipment.

Top End Sports. URL:<http://www.topendsports.com>

Lots of information on a range of sports, fitness testing, fitness training, sports nutrition and sport science.

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.

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>

MAPPING WITHIN THE QUALIFICATION TO OTHER UNITS

Unit 1: Principles of Anatomy and Physiology in Sport

Unit 9: Exercise for Specific Groups

Unit 15: Sports Injuries

Unit 18: Sport and Exercise Massage



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

www.ocr.org.uk