

Course Title	Exercise Science	Course Code	9369
Semester Unit	Exercise Physiology and Sports Medicine 97944	Unit Value	1.0
Term 1 Unit	Exercise Physiology 97945	Unit Value	0.5
Term 2 Unit	Sports Medicine 97946	Unit Value	0.5

Specific Unit Goals

This T unit should enable students to:

- explore and examine the physiology involved in muscular contraction and the relationship to the nervous system
- critically analyse the energy requirements of exercise and the interplay of energy systems during rest and exercise
- examine and evaluate the acute and chronic physiological adaptations and responses to exercise and training
- demonstrate an understanding of the factors which influence sports performance
- explore and examine a range of principles of Sports Psychology and the relationship to sports performance
- compare and contrast between different types of motivation and identify them from information supplied by athletes
- evaluate how different arousal states may be achieved in sports performance through positive or negative means
- critically analyse the cognitive strategies used in mental preparation for performance

CONTENT SUMMARY

Exercise Physiology

- Physiology of Muscle Contraction, Sliding Filament Theory (The Energetics of Muscular Contraction) and Muscle Metabolism
- Recap Muscular System: muscles shapes and fibre arrangements; muscle characteristics; muscle fibre types; muscles and movement; types of contractions; muscles at work; gross and microscopic structural and organisational levels of skeletal muscle; nervous control of muscular contraction.
- The Sliding Filament Theory of Muscular Contraction, Muscle Fatigue, Rigour Mortis, Muscle Tone, Muscle Cramp, The Motor Unit and Strength Gradations (Graded Muscle Responses), Muscle Twitch, Gradation of Contraction, Wave Summation, Tetanus
- Fuel for Exercise – Energy Requirements of Sport Activities - Revisit Types of Energy and Energy Interplay in the Body
- Summary of the energy systems
- ATP
- Sources of ATP (CHO, Protein, Fats)
- Function of ATP
- Production of ATP – during rest and during exercise
- Summary of systems
- Comparing the three energy systems
- Energy system interplay
- Physiological Adjustments to Training (Acute Responses to Training)
- Oxygen uptake and delivery during exercise
- Oxygen deficit and aerobic steady state
- Oxygen debt (Types of oxygen debt: alactacid and lactacid)
- Oxygen uptake during recovery
- Physiological Responses and Adaptations to Exercise.
- Anaerobic and aerobic capacities and VO₂ and VO₂ maximum (Factors which effect VO₂ max: aerobic fitness; body size; gender; hereditary and age)
- Anaerobic energy system adaptation and anaerobic threshold (OBLA, Lactate Profiles, How to improve anaerobic threshold)
- Aerobic energy system adaptation
- Muscular training adaptations (and Muscle Fibres) Cardiorespiratory and Muscular Chronic Changes
- Anaerobic training adaptations at the muscular level

- Aerobic training adaptations at the muscular level
- Physiological requirements of varying activities (Chronic responses to training)
- Adaptations are reversible
- Muscular Fatigue and Recovery Mechanisms
- What is Fatigue
- Causes of Fatigue
- Depletion of Fuels
- Metabolic By-products
- Dynamics of lactate formation and its accumulation in blood during exercise.
- The Redistribution of Blood
- Dehydration
- Factors which Influence Sport Performance
- Exercise in the heat and in the cold
- Exercise at altitude and underwater
- Effects of pollution on exercise capacity
- Travel and sports performance

Sports Medicine

- Classification of sports injuries: direct, indirect, overuse, recurrent, soft tissue and hard tissue and examples of contributors to these injuries
- Skin injuries: abrasions, bruising, lacerations
- Soft tissue injuries: muscle, bruises, contusions, ligaments (sprains), tendon (strains)
- Hard tissue injuries: fractures, dislocations, subluxations, head, neck and spinal injuries.
- Overuse and recurrent injuries: stress fractures, Achilles tendon, tennis elbow.
- Physiological Healing Phases.
- Assessment of sports injuries: STOP- stop, talk, observe and prevent further injury; TOTAPS - talk, observe, touch, active movement, passive movement, skills test and DRABCD - danger, response, airway, breathing, circulation and defibrillation (CPR).
- Treatment of skin, soft and hard tissue injuries: Immediate treatment of skin injuries; RICER- rest, ice, compression, elevation, referral and cryotherapy; Immobilisation and support (sling, cervical collar, splint).
- Prevention of Sports Injuries
- Physical preparation (skill, technique, flexibility, endurance, strength, sport specific requirements, warm up, cool down).
- Protective equipment (protective guards, apparel, playing equipment).
- Sports policy (responsibilities of the club, school, coach, administrator, sports trainers), rules of the sport (modified for children), and physically balanced competition.
- Sports environment (grounds and facilities).
- Taping and Bandaging (preventative taping, biofeedback, taping for an injury, i.e. ankle, finger, thumb).
- Rehabilitation of injuries (injury management procedures, returning to play, current injury management equipment / methods i.e. acupuncture, hydrotherapy, DOMS- Delayed onset muscle soreness, therapeutic massage).

ASSESSMENT

TASK	DUE DATE	WEIGHTING
Exercise Physiology Exam	Week 9 (Term 1)	35%
Sports Medicine Case Study and Oral Presentation	Week 15-17 (Term 2)	30%
Sports Medicine Exam	Week 18 (Term 2)	35%

Specific Entry & Exit Requirements for Term Units

It is possible to enter this course at term 2.

This is a Semester Unit.

To exit at term 2 you must complete **additional assessment**.

ASSESSMENT CRITERIA FOR ASSESSMENT AND REPORTING OF STUDENT ACHIEVEMENT

The following assessment criteria are a focus for assessment and reporting in this unit. Criteria are the essential qualities that teachers look for in student work. These criteria must be used by teachers to assess student's performance, however not all of them need to be used on each task. Assessment criteria are to be used holistically on a given task and in determining the unit grade.

Students will be assessed on the degree to which they demonstrate:

Assessment Criteria	Outcomes
Knowledge and Understanding	<ul style="list-style-type: none"> • Demonstrates knowledge of concepts, theories and terminology, rules and strategies • Applies and interprets knowledge and understanding of concepts, terminology, rules and strategies
Communicating and Organising	<ul style="list-style-type: none"> • Demonstrates ability to plan and organise • Communicates depth and breadth of knowledge using a variety of methods

Participation in Activities	<ul style="list-style-type: none"> • Works with initiative and independence to develop and practise skills • Participates in a wide range of activities
** Awareness of Safety	<ul style="list-style-type: none"> • <i>Demonstrates understanding of safety issues, procedures and safe use of equipment</i>
Working with Others	<ul style="list-style-type: none"> • Enthusiastic and productive team member • Demonstrates mediation skills and encourages and supports others
** Development of Motor Skills	<ul style="list-style-type: none"> • <i>Develops a range of motor skills</i> • <i>Demonstrates a range of motor skills</i> • <i>Is able to reproduce motor skills in a variety of situations</i> • <i>Responds to corrective feedback</i>

UNIT GRADES FOR COURSE (from Course Framework)

See back page

ATTENDANCE AND PARTICIPATION

Students are expected to submit all assessment items and attend all classes, participate in a positive manner and seek support whenever it is required. Excursions, simulations and presentations by visitors (including lunchtime) may form part of classwork. It is your responsibility to catch up on missed work when absent from class.

Any student whose attendance falls below the 90% of the scheduled classes/contact time and has not provided substantial documentary evidence to cover the absence will be awarded a V grade. This means that 4 unexplained absences in a term or 8 unexplained absences in a semester could mean that a V grade may be awarded. However, the Principal has the right to exercise discretion in special circumstances if satisfactory documentation is supplied.

LATE SUBMISSION OF WORK

Students are encouraged to submit work on time as it is a valuable organisational skill. Students are also encouraged to complete work even if it is late, as there are educational benefits in doing so.

Late work will receive a penalty of 5% (of possible marks) per calendar day late, unless an extension is granted by the class teacher prior to the deadline. This means that 5% is taken off the possible marks that could have been achieved eg. If a student achieved a score of 75/100, and the item is one day late, then five marks (5% of 100) would be taken from 75, which leaves the score as 70/100. 'Per calendar day late' means each day late whether it be a weekend or public holiday. Items due on any date must be submitted to the class teacher, faculty staff room, or front office at the college by 3.30pm on that day. After 3.30pm, the item will attract the late penalty. Submission of work on a weekend or public holiday is not acceptable. If you do not submit your work to your class teacher, make sure that it is signed and dated by either another member of staff in the faculty staffroom, or a member of the front office staff.

After 7 days, late work will be awarded the Notional Zero. Calculation of a Notional Zero is based on genuine scores, (items submitted on time or with an extension). The Notional Zero will be a score that lies between 0.1 of the standard deviation below the lowest genuine score for that item and zero. If the lowest genuine score is zero, then the notional score is zero.

No work will be accepted after marked work has been returned, or accepted after the unit has completed. Computer and/or printer failure will not be accepted as a valid reason for late work. Make sure you backup, keep hard copies and rough notes.

Unless prior approval is granted, any student who fails to submit assessment tasks worth in total 70% or more of the assessment for the unit will be considered to be unassessable and will receive a V grade. The Principal has the right to exercise discretion in the application of the late penalty in special circumstances where satisfactory documentation is supplied.

CHEATING AND DISHONEST PRACTICE

The integrity of the College's assessment system relies upon all involved acting in accordance with the highest standards of honesty and fairness. Any departure from such standards will be viewed very seriously." Accordingly:

- Plagiarism - claiming authorship of someone else's work (intentionally or otherwise) - is a serious misdemeanour, and attracts severe penalties.
- Students are required to acknowledge the source of all material that is incorporated into their own work.
- Students may not submit the same item for assessment in more than one unit, unless specific agreement has been reached with the class teacher.

MODERATION

Throughout the semester, moderation in the form of common marking schemes, cross marking and joint marking occurs across all units in the Moderation Group to ensure comparability of standards. Moderation is a process whereby student's work is compared so that student performance can be graded fairly and consistently. Moderation takes some time, and so students may not receive their work back until ACT wide moderation of grades across all colleges has occurred. Small Group Moderation is carried out in courses with small class sizes.

UNIT SCORES

- Raw scores are calculated by adding Z scores according to the weightings in the assessment table.
- All raw unit scores are then combined into two rank order lists, one for each cohort Year 11 and 12. Each list is reviewed by the Executive Teachers concerned to identify any anomalies.
- Each of the rank order lists is then standardised for each semester using historical parameters or backscaling.

RIGHT TO APPEAL

You can appeal against your assessment if you feel that the result you obtained is not fair. You should first talk to your class teacher, and if you are not satisfied with the explanation you must discuss the situation with the Executive Teacher of the faculty concerned. If you still do not feel that your result is fair you should talk to the Deputy Principal Programs for further advice on the 'appeal process'.

Executive Mark Armstrong

Class Steve Smith, Nat Keen, Dan Hawke

Unit Grade Descriptors for T Courses

	<i>A student who achieves an A grade typically</i>	<i>A student who achieves a B grade typically</i>	<i>A student who achieves a C grade typically</i>	<i>A student who achieves a D grade typically</i>	<i>A student who achieves an E grade typically</i>
Knowledge, Understanding & Application	<ul style="list-style-type: none"> independently researches to source highly relevant information and uses information ethically with appropriate referencing and citation demonstrates a comprehensive knowledge of concepts and applies skills reflecting a thorough understanding of context, attitudes and values 	<ul style="list-style-type: none"> independently researches to source relevant information and uses information ethically in most occasions with acceptable referencing and citation demonstrates a detailed knowledge of concepts and applies skills reflecting a broad understanding of context and attitudes 	<ul style="list-style-type: none"> researches to source mostly relevant information and uses information with some adherence to conventions demonstrates general knowledge of concepts and applies skills in familiar contexts 	<ul style="list-style-type: none"> conducts some research to source and reference information with minimal adherence to conventions demonstrates minimal knowledge of concepts and applies skills in familiar contexts 	<ul style="list-style-type: none"> conducts minimal research to source information with little or no adherence to referencing and citation conventions demonstrates limited knowledge of concepts and applies skills in familiar contexts with instruction
Analysis & Evaluation	<ul style="list-style-type: none"> analyses, synthesises and evaluates information, concepts and issues and draws insightful conclusions makes highly informed choices, constructs persuasive arguments and justifies decisions with appropriate evidence 	<ul style="list-style-type: none"> analyses and evaluates information, concepts and issues and draws appropriate conclusions makes informed choices, constructs logical arguments and justifies decisions with appropriate evidence 	<ul style="list-style-type: none"> identifies, describes and explains information, concepts and issues and draws general conclusions makes routine choices, constructs arguments and justifies decisions with some inconsistencies 	<ul style="list-style-type: none"> identifies and describes information and draws simple or unsubstantiated conclusions makes some choices, retells information and makes uninformed decisions 	<ul style="list-style-type: none"> identifies information and draws conclusions with guidance retells information with guidance
Communication Skills	<ul style="list-style-type: none"> communicates persuasively and conveys ideas appropriate to audience in an organised, clear and concise manner 	<ul style="list-style-type: none"> communicates effectively and conveys ideas appropriate to audience in an organised and clear manner 	<ul style="list-style-type: none"> communicates ideas appropriate to audience in an organised manner with some lapses in clarity 	<ul style="list-style-type: none"> communicates ideas with lapses in organisation and clarity 	<ul style="list-style-type: none"> communicates ideas with little awareness of audience and purpose
Performance Skills	<ul style="list-style-type: none"> displays initiative and highly effective leadership skills and the ability to work independently and collaboratively performs exemplary physical skills with control; adjusts intuitively to conditions; displays initiative responds to feedback and actively seeks challenges and consistently adheres to WHS guidelines 	<ul style="list-style-type: none"> displays leadership skills and the ability to work independently and collaboratively performs accomplished physical skills with skill and adjusts to conditions responds to feedback and is regularly open to challenges and consistently adheres to WHS guidelines 	<ul style="list-style-type: none"> displays some leadership skills and the ability to work independently and collaboratively performs competent physical skills with consistent planning and organisation responds to feedback and is usually open to challenges and adheres to most WHS guidelines 	<ul style="list-style-type: none"> displays the ability to work independently and collaboratively performs fundamental physical skills with inconsistent planning and organisation responds to challenges when directed and occasionally responds to feedback and shows some awareness of WHS guidelines 	<ul style="list-style-type: none"> displays limited ability to work independently and collaboratively performs physical skills with limited planning and organisation responds to some feedback and challenges with guidance; addresses some risk and safety issues

T Course note: The Assessment Criteria, **Performance Skills** must allow students to demonstrate a graded level of performance and/or the application of theoretical knowledge and understanding.