

NATS 3047 APPLIED PHYSIOLOGY

Credit Points 10

Legacy Code 401412

Coordinator Shona Papalia ([https://directory.westernsydney.edu.au/search/name/Shona Papalia/](https://directory.westernsydney.edu.au/search/name/Shona%20Papalia/))

Description From 2020 this unit replaces 401146 - Applied Physiology. This unit focuses on the application of exercise physiology in sporting and physically demanding occupation contexts. Concepts covered include: muscular fatigue, soreness & recovery, General Adaptation Syndrome Theory, testing, training and periodisation in an individualised approach to the client. Students will develop skills to appropriately: select, justify perform and evaluate a number of laboratory, field and functional tests; analyse, interpret and communicate test results; prepare, justify, implement and evaluate individualised training and recovery plans (long and short term); incorporate other sport and exercise science sub-disciplines into plans and appropriately adjust plans for environmental challenges.

School Health Sciences

Discipline Medical Science

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 3 subject

Pre-requisite(s) HLTH 2005 AND HLTH 2004 AND BIOS 2012

Equivalent Subjects BIOS 3022 - Sport Physiology BIOS 3003 - Advanced Sport Physiology BIOS 3008 - Applied Physiology

Restrictions

Students must be enrolled in 4658 - Bachelor of Health Science (Sport and Exercise Science).

Assumed Knowledge

The knowledge and skills covered in the pre-requisite subjects. In addition students are expected to have a mathematical ability equal to a passing level in the BOSTES (NSW) numeracy test. See <http://www.boardofstudies.nsw.edu.au/rosa/literacy-and-numeracy-tests.html>. Students whose mathematical ability is not at this level or who have not used such mathematics recently are encouraged to seek assistance early through the Mathematics Educational resource Hub (MESH) <http://www.westernsydney.edu.au/mesh/mesh> (<http://www.westernsydney.edu.au/mesh/mesh/>).

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Discuss how a variety of physiological, metabolic, hormonal and neural factors may impact on physical performance in sport and physically challenging occupations
2. Design, justify, organise and conduct fitness and functional assessments suitable for individual clients in the sport and physically challenging occupations.

3. Interpret, evaluate and report the assessment results to relevant stakeholders including clients, coaches and other professionals working with sport persons and those in physically challenging occupations.
4. Apply practical knowledge of over training syndrome and current theories on the physiology of muscular fatigue, acute muscle soreness and delayed onset muscle soreness to optimise health outcomes and performance of individual clients in sport and physically challenging occupations.
5. Design, justify, implement, supervise, monitor and evaluate individualised training programs including long term, short term and session plans for sport and physically challenging occupations.
6. Integrate knowledge and skills from other sport and exercise science sub-disciplines into the professional practice of the exercise physiologist working with sports persons and those in physically challenging occupations.
7. Critically evaluate current research literature to ensure an evidence-based approach to practice and continuing professional development.

Subject Content

1. Factors that can limit/determine physical performance in sport and physically challenging occupations
2. Physiological testing of fitness and function
 - a). Roles of testing in sport and physically challenging occupations
 - i. Talent ID, pre-employment, diagnosis, evaluate training, inform training specifics
 - b). Scientific basis for fitness and functional testing
 - c). Identifying important fitness attributes
 - d). Identifying appropriate tests and groups of tests
 - ii. Evidence base for choices
 - iii. Factors influencing the quality and usability of the results
 - Validity, reliability, Objectivity, accuracy and discriminating ability
 - Cohort characteristics: Males Vs Females, Age (children Vs adolescents Vs adults Vs older individuals)
 - norms, criteria
 - nutrition, hydrations, familiarisation, environment
 - e). Testing management and administration
 - i. Legal compliance factors: Consent; Privacy (PIIPA & HRIPA), working with children, risk assessments, SOPs
 - ii. Equipment: calibration; quality assurance
 - iii. Organisation of space, equipment and staff
 - iv. Preplanning of data recording, processing and interpretation for reporting
 - f). Commonly used tests: VO₂max, anaerobic threshold, OBLA, anaerobic exercise capacity; muscular strength, power and endurance; flexibility (ROM); speed; power; general functional movement and functional skill; and other sport/occupation specific tests
 - g). Practical work: Research, learn, design and implement a testing program including organise, conduct, interpret and report the results of physiological and functional tests that can be implements in the laboratory and field
3. Exercise Training for sport and physically challenging occupations
 - a). Scientific basis of training adaptation ? genomics, proteomics etc
 - b). General Adaptation Theory and its application to training and recovery planning
 - c). Current guidelines for developing fitness for optimum performance ? training types and their expected effects on responses and adaptations to exercise and on test results
 - d). Why & how knowledge and skills in psychology, motor control & learning, biomechanics and other sub disciplines can value add to the quality of the exercise physiologists input into training design
 - e). Annual Plans, periodisation, peaking, tapering, detraining. Macro cycles, micro cycles, individual session plans

- f). Using test results to set training specifics
 - g). Influences of age, experience, gender, environment, nutrition, drugs/medications, hydration
 - h). Monitoring responses to training ? within sessions, over time
 - i). DOMs, Overtraining, returning to training post injury/illness
 - j). Practical work: training program design (all levels), implementation, supervision, record keeping and evaluation
 - k). Participation in and evaluation of testing and training programs
4. Other
- a). Discipline specific OH&S ? related to practical tasks of the unit
 - b). Communication with peers, academic supervisors, athletes, coaches, parents and others in support teams

Special Requirements

Legislative pre-requisites

Note: First Aid Requirement has been removed for Spring 2021 due to Covid Restrictions.

Prior to enrolling in this subject, students must hold a valid and current First Aid Certificate from a Registered Training Organisation. Use the link to the Special Requirements webpage below for more information. Special requirements (https://www.westernsydney.edu.au/currentstudents/current_students/enrolment/special_requirements/)

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Competency Assessments: From 5 to 20 Unit Specific Work Health & Safety training and assessment of understanding of training x 3 and Laboratory practical skills x 4	Varied: minutes each	Hurdle	Y	Individual
Literature Review	2,000 words	35	N	Individual
In class tests (MCQs and short answers, calculations) x 2	Up to 1 hour each	30	N	Individual
Professional Task: Designing and justifying Testing & Training Programmes X 4	1 page per plan plus up to 500 words for each of the program plans	35	N	Individual

- Bompa TO, Buzzichelli C. Periodization training for sports. 3rd ed. author, editor. Champaign: Human Kinetics; 2015.

Teaching Periods

Spring Campbelltown

Day

Subject Contact Shona Papalia ([https://directory.westernsydney.edu.au/search/name/Shona Papalia/](https://directory.westernsydney.edu.au/search/name/Shona%20Papalia/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=NATS3047_22-SPR_CA_D#subjects)

Prescribed Texts