Module Definition Form (MDF)

Module code: MOD005689	**Version:** 8 **Date Amended:** 24/Oct/2024

1. Module Title
Physiological Responses to Training

2a. Module Leader
Ash Willmott

2b. School
School of Psychology, Sport and Sensory Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
6

3b. Module Type
Standard (fine graded)

4a. Credits
15

4b. Study Hours
150

5. Restrictions

Type	Module Code	Module Name	Condition
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BSc (Hons) Sport and Exercise Science (all variants) BSc (Hons) Strength and Conditioning with Rehabilitation		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Within this module, you will critically evaluate the methods used in training and advance your knowledge on the array of physiological, metabolic and biochemical adaptations that arise. These are fundamental attributes required within professional practice in real-world settings, such as those working in elite sport (e.g. sport scientists, exercise physiologist and strength & conditioning coaches). Through a series of integrated lectures and seminars, we will address key the components of fitness (e.g. aerobic and anaerobic endurance, strength, power, flexibility and speed) and within each of these domains, you will explore the application of various training approaches in the context of intensity, frequency and duration (e.g. training loads). Throughout the module, you will synthesis current and relevant research, and complete in-depth analysis of how these training approaches are associated with the developmental status of an elite athlete, the phase of the training cycle and anticipated training outcome. You will then critically evaluate the training adaptations and reflect on the methodological approaches and interventions, to both derive the data and conclusions that were drawn. Particular emphasis will be placed on the key responses and adaptations to training, including; myocardial, haematological, immunological, enzymatic, cellular, substrate, metabolite, muscular and neurological. You will then develop a clear understanding of the training environments and practical considerations, before reflecting on the application of key training strategies and physiological consequences in association with altitude, heat and pollution exposure, jetlag, menstruation, aging and disability. This content reflects current and relevant professional practices, for example, sport practitioners (England FA, English Institute of Sport and Team GB physiologists, physiotherapists and strength & conditioning coaches) planning their preparations for Tokyo 2020 Olympic and Paralympic Games, and Qatar 2022 FIFA World Cup. Alongside the professional application of specialised knowledge within sport and exercise sciences, you will advance your key employability skills related to IT, numeracy and communication, in addition to translating research for a lay audience. This module will be of particular interest to those who wish to develop a critically applied scientific understanding of the physiological mechanisms of training, have interest in professional and high-performance sport and wish to pursue a career in the sport and exercise sciences.

6b. Outline Content

• Training loads: Intervals, continuous, base development, sets, repetitions,, recoveries

• Aerobic endurance: cardiovascular, enzymatic, cellular respiration, haematological

• Anaerobic endurance: Enzymatic, substrate, metabolite, biochemical

• Strength and power: Myofibrillar, neurological, enzymatic, morphological

• Speed: Neurological, substrate, metabolic, enzymatic

• Flexibility: Neuromuscular, musculo-tendon

• Training environments: altitude, pollution, jetlag, heat, menstruation, age

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Cambridge Centre for Sport and Exercise Sciences

Technician support

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Critically appraise the methods and mechanisms of training the key components of fitness
2	Knowledge and Understanding	Critically appraise the physiological responses and adaptations to training
3	Intellectual, practical, affective and transferrable skills	Apply knowledge of training methods to real-life situations and scenarios
4	Intellectual, practical, affective and transferrable skills	Apply physiological training knowledge to an array of athlete types and environments

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	24	1-4	Lectures 2 hours per week
Other teacher managed learning	12	3-4	Seminars: 1 hour per week
Student managed learning	114	1-4	Completion of weekly readings, tasks and preparation for assessments
TOTAL:	150		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-4	10 (%)	Fine Grade	30 (%)
A portfolio of CBAs based on peer reviewed articles, data analysis and interpretation (500 word equivalent)					

Assessment components for Element 010			
Component No.	**Assessment Title**	**Submission Method**	**Components needed for Mark Calculation?**
010/1	CBA 1: Endurance Training	Scheduled Activity: Timetabled assessment task	Best 5 out of 5. All components used in calculation are equally weighted
010/2	CBA 2: High Intensity Interval Training	Scheduled Activity: Timetabled assessment task	
010/3	CBA 3: Strength and Power Training	Scheduled Activity: Timetabled assessment task	
010/4	CBA 4: Heat Training	Scheduled Activity: Timetabled assessment task	
010/5	CBA 5: Altitude Training	Scheduled Activity: Timetabled assessment task	

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Practical	1-4	90 (%)	Fine Grade	30 (%)
E-poster and defence based on the critical review of literature relating to a specific training approach, application (2500 words equivalent)					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]