INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Exercise Physiology			Field of study	Health Sciences		
Bachelor in	Physiotherapy			School	School of Health		
Academic Year	2023/2024	Year of study	1	Level	1-1	ECTS credits	4.0
Type	Semestral	Semester	2	Code	9504-770-1204-00-23		

Workload (hours)	108	Contact hours	T	TP	PL	TC	S	E	OT	O
			30	15	-	-	-	-	20	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Mário Alexandre Gonçalves Lopes, Pedro Miguel Queirós Pimenta Magalhaes

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Describe in detail the functioning of the energy systems according to the characteristics of physical exercise.
2. Understand and interpret accurately the process of muscle contraction during physical exercise.
3. Know and interpret the physiological events that occur during the recovery period after exercise in different environmental conditions.
4. Describe in detail the functioning of the neuromuscular, cardiovascular, respiratory and endocrine systems during physical exercise.
5. Describe the mechanisms involved in the acute and chronic adaptations to physical exercise.

Prerequisites

Before the course unit the learner is expected to be able to:
Not applicable

Course contents

A. Introduction to exercise physiology; B. Energy systems; C. Muscle structure and function; D. Neuromuscular adaptations to training; E. Cardiorespiratory adaptations; F. The endocrine system and physical exercise; G. Exercises in hyperbaric and hypobaric environments

Course contents (extended version)

1. Introduction to exercise physiology
   - Concepts of sports medicine, kinesiology and exercise physiology
   - Acute adaptations to physical exercise
   - Chronic adaptations to training
2. Power systems
   - Alactic anaerobic system
   - Anaerobic lactic system
   - Aerobic system
   - Metabolic adaptations to exercise
   - Metabolic adaptations to training
3. Muscle structure and function
   - Skeletal muscle and exercise
   - Skeletal muscle adaptations to training
4. Neuromuscular adaptations to training
   - Neural control of muscle movement
   - Strength gains
   - Differences depending on sex and age
5. Cardiorespiratory adaptations
   - Cardiovascular adaptations to exercise and training
   - Breathing adjustments to exercise
   - Assessment of aerobic capacity
6. The endocrine system and physical exercise
   - Hormone secretion glands
   - Hormonal response to exercise
7. Exercises in hyperbaric and hypobaric environments
   - Exercise at altitude
   - Acute and chronic adaptations to altitude
   - Physiological responses to diving

Recommended reading

1. Brooks, G. A. , Fahey, T. D. , & White, T. P. (2000). BKM Exercise physiology: Human bioenergetics and its applications.
2. FOSS, ML; KETEYIAN, SJ (2000). Bases fisiológicas do exercício e do esporte. (6ª Edição). Editora Guanabara Koogan.
3. Kenney, W. L. , Wilmore, J. H. , & Costill, D. L. (2021). Physiology of sport and exercise. Human kinetics.
4. Powers, S. K. , Howley, E. T. , & Quindry, J. (2007). Exercise physiology: Theory and application to fitness and performance (p. 640). New York, NY: McGraw-Hill.
5. McArdle, W.D.; Watch, F.I.; Watch, V.L. (2019). Fisiologia do Exercício (8ª Edição). Guanabara Koogan.

Teaching and learning methods

Oral presentation and through multimedia.
Completing worksheets.
Research work, analysis and interpretation of text/scientific articles.
Development of learning situations.

Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 60% (Two mini-tests)
   - Practical Work - 30% (Group work)
   - Practical Work - 10% (Individual development work)
2. Exam evaluation - (Regular, Student Worker) (Supplementary, Special)
   - Final Written Exam - 100% (Final written exam)

Language of instruction

1. Portuguese
2. Portuguese, with additional English support for foreign students.

Electronic validation

Mário Alexandre Gonçalves Lopes, Pedro Miguel Queirós Pimenta Magalhaes	Adília Maria Pires da Silva Fernandes	Ana Maria Nunes Português Galvão	Olívia Rodrigues Pereira
03-04-2024	07-04-2024	07-04-2024	09-04-2024