



Information about the subject

Degree: Official Master's Degree in Sciences Applied to the Prevention and Functional

Readaptation of Sports Injuries

Faculty: Faculty of Physical Activity and Sport Sciences

Code: 1640008 **Name:** New Trends in Exercise Physiology

Credits: 6,00 **ECTS Year:** 1 **Semester:** 1

Module: 1: Advanced Science in athletic performance

Subject Matter: New trends in exercise physiology. **Type:** Compulsory

Department:

Type of learning: Blended

Languages in which it is taught: Spanish

Lecturer/-s:

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Module organization

1: Advanced Science in athletic performance

Subject Matter	ECTS	Subject	ECTS	Year/semester
Advanced Science in athletic performance	6,00	Advances in Biomechanics and Kinesiology of Sports Gesture	6,00	1/1
New trends in exercise physiology.	6,00	New Trends in Exercise Physiology	6,00	1/1

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 Acquisition of knowledge in biomechanics and kinesiology.
- R2 Search for information to expand and personalize theoretical and practical content.
- R3 Acquisition, management and adaptation of devices, instruments, methodologies and protocols related to biomechanics and kinesiology.
- R4 Description, analysis and evaluation of protocols for the application of instrumental techniques in biomechanics and kinesiology.
- R5 Express, synthesize and organize content in writing.



Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB6	Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.		X		
CB7	That the students know how to apply the acquired knowledge and their problem-solving capacity in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study.			X	
CB8	That students are able to integrate knowledge and face the complexity of formulating judgments from information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.			X	
CB9	That students know how to communicate their conclusions and the latest knowledge and reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.				X
CB10	That students possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.			X	
SPECIFIC		Weighting			
		1	2	3	4
E1	Achieving comprehensive knowledge yet specialized subjects related to applied science to prevention and functional rehabilitation of sports injuries.			X	
E2	Ability to relate specific knowledge acquired in the theoretical sessions, in order to collaborate in solving problems that may arise in the prevention and recovery of sports injury integrating knowledge from different professional fields involved in managing the injured athlete.				X



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E4	Responding to increasing demand readaptador specific functional, as part of multidisciplinary professional team serving the injured athlete, and as the lead actor of the specific protocols for prevention and functional rehabilitation of sports injuries.		X
E5	Manage-own tools of their profession-that allow an objective assessment of the athlete's fitness (strength, endurance, muscle tone and volume, etc..) Key phases of injury prevention and recovery in the strictly functional.		X
E6	Knowing how to plan, schedule, monitor, evaluate, coordinate and direct the prescription, prevention, exercise programming, and retraining the athlete's effort according to their profile, and the competition at the moment we meet.		X

Assessed learning outcomes	Granted percentage	Assessment method
R1, R3	80,00%	Written tests (open questions, type test, ...).
R2, R4, R5	20,00%	Problem solving and case studies.

Observations

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1	Master class.
M2	Laboratory.



M3 Seminar.

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical class. M1	R1, R3	25,00	1,00
Practical class / seminar. M2, M3	R1, R3	37,50	1,50
Tutoring. M3	R1, R3	12,50	0,50
TOTAL		75,00	3,00

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Team work. M3	R2, R4	25,00	1,00
Autonomous work. M3	R2, R4	50,00	2,00
TOTAL		75,00	3,00



Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
UNIT 1: PHYSIOLOGICAL ADAPTATIONS INDUCED BY SPORTS INJURY	Introduction and concepts of physiology. Injury pathophysiology. Injury risk. Causes of injury risk factors. Sports injury definition and classifications. Natural evolution of the injury. The inflammation. Inflammatory phases. Cellular response to inflammation. Growth factors involved. APR, acute phase response. Neural axis adaptation.
UNIT 2: NEW TRENDS IN EXERCISE PHYSIOLOGY	Use of physiological indicators of performance in the programming of specific training sessions (heart rate variability, ventilatory thresholds, lactic threshold, respiratory quotient, Vemax, maximum speed and power, VO 2max, etc.)
UNIT 3: NEW TECHNOLOGIES FOR FUNCTIONAL ASSESSMENT	New trends in exercise physiology and functional assessment. Portable expired gas analyzers. Wireless cardiac monitoring for team sports. GPS-accelerometers.
UNIT 4: OVER TRAINING RISK FACTORS AND ITS PREVENTION	Influence of fatigue in the recovery process. Prevention of overtraining. Assessment and specialized medical monitoring of overtraining. Readaptation of the overtrained athlete.
UNIT 5: SPECIFIC ASPECTS OF NUTRITION IN THE PREVENTION AND READAPTATION OF INJURIES	Advances in molecular nutrition. Hydro-electrolyte balance. Prevention of muscle damage. Ergogenic contributions.



Temporary organization of learning:

Block of content	Number of sessions	Hours
UNIT 1: PHYSIOLOGICAL ADAPTATIONS INDUCED BY SPORTS INJURY	6,50	13,00
UNIT 2: NEW TRENDS IN EXERCISE PHYSIOLOGY	7,00	14,00
UNIT 3: NEW TECHNOLOGIES FOR FUNCTIONAL ASSESSMENT	8,00	16,00
UNIT 4: OVER TRAINING RISK FACTORS AND ITS PREVENTION	8,00	16,00
UNIT 5: SPECIFIC ASPECTS OF NUTRITION IN THE PREVENTION AND READAPTATION OF INJURIES	8,00	16,00



References

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