1. BASIC INFORMATION

Course	Physiology of high performance: fatigue, recovery, training under extreme conditions and women.
Degree program	Degree in Physical Activity and Sport Sciences
School	Physical activity and sport sciences and physiotherapy
Year	Fourth
ECTS	6 ECTS
Credit type	Optional
Language(s)	Spanish and english
Delivery mode	On-site
Semester	S7
Academic year	2027/2028
Coordinating professor	David Barranco Gil

2. PRESENTATION

Physiology of high performance: fatigue, recovery, training in extreme conditions and women is an elective course taught in the fourth year of the Degree in Physical Activity and Sport Sciences. It is a subject of 6 ECTS credits that aims to deepen the knowledge of exercise physiology. This course deals with all the topics related to high competition and performance in sports linked to exercise physiology being constantly updated given the great evolution of this field of knowledge with the aim of improving the performance of the athlete.

The course is developed in such a way that the theoretical contents are reinforced with related practices in the laboratories of the university, especially the exercise physiology laboratory.

In addition, there are classroom practices, debates, video analysis and other activities that reinforce learning. In this way, it is intended that the future graduate acquires a series of skills, knowledge and competencies that will enable him/her to manage entities aimed at sports performance.

3. LEARNING OUTCOMES

Knowledge

KON1. Identifies the anatomical structures and functions of the various systems of the human body and consider pathophysiology to determine its applicability and development through physical exercise.

- Describes the body's adaptations and responses to cases of heat shock that may affect performance.
- Identifies the impact of exposure to extreme environments on the athlete.

- Identifies women's physiology as a core feature for improving sporting performance.
- Identifies the importance and implications of weight on sporting performance.
- Describes the importance of the concepts of fatigue, rest and overtraining for sporting performance.

Skills

AB01. Examines the anatomy and the functions of the various systems or structures and consider the extent to which they, along with pathophysiology, influence responses to physical exercise.

- Understands the importance of blood biomarkers for an athlete's performance.

Competences

COMP5. Develop the expertise to lead, plan and implement physical exercise and fitness programmes, and conduct technical/scientific evaluations of them, based on scientific evidence, in different fields, contexts and activities for the entire population, with a focus on particular groups such as senior citizens (the elderly), schoolchildren, people with disabilities and people with diseases, health problems or similar conditions (diagnosed and/or prescribed by a physician), taking into account gender and diversity considerations.

COMP8. Develop and draw on the expertise needed to analyse, design and evaluate tests that seek to assess and control physical fitness, and physical/sporting performance.

COMP10. Draw on the expertise needed to plan, implement, control and evaluate fitness and sports training processes.

COMP37. Strategic communication. Transmit messages (ideas, concepts, feelings, arguments), both orally and written, strategically aligning the interests of the different stakeholders involved in the communication in the academic and professional environment.

COMP40. Teamwork. Cooperate with others in shared academic or professional objectives, participating actively, empathically and exercising active listening and respect for all members.

COMP41. Critical analysis. Integrate analysis with critical thinking in a process of evaluating different ideas or professional possibilities and their potential for error, based on evidence and objective data that lead to effective and valid decision-making.

4. CONTENT

Topic 1. Sports performance and thermal stress: physiological responses and adaptations.

Topic 2. Extreme environments and sport performance

Topic 3. Sports performance and women: physiological implications in performance assessment and training planning

Topic 4. Optimal body weight and sport performance.

Fatigue, rest and overtraining.

Topic 6. Biomarkers and sport performance.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Master class
- Case method
- Cooperative learning

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Campus-based mode:

Learning activity	Number of hours
Master classes	12 h
Practical application classes	18 h
Oral expositions of works	10 h
Independent work	56 h
Debates and colloquiums	8 h
Tutoring	12 h
Knowledge tests	2 h
Elaboration of reports and writings	12 h
Case analysis	20 h
TOTAL	**150**

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Campus-based mode:

Assessment system	Weight
Face-to-face evaluation test	40-50%
Oral presentations	5-10%
Case/Problem	35-45%
Reports and written papers	5-10%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

To pass the course in the first exam period, you must obtain a final course grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of at 4.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

7.2. Second exam period

To pass the course in the second exam period, you must obtain a final grade of at least 5 out of 10 (weighted average).

In any case, you will need to obtain a grade of at 4.0 in the final exam in order for it to count towards the final grade along with all the grades corresponding to the other activities.

The student must deliver the activities not successfully completed in the first exam period after having received the corresponding corrections from the professor, or those that were not delivered in the first place.

8. SCHEDULE

This table shows the delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Activity 1: Study of the response to exercise in heat stress situations	Week 4
Activity 2: Bibliographic search and elaboration of a written document on physiological adaptations to the different strategies of high altitude training	Week 6
Activity 3. midterm test (objective multiple-choice test)	Week 8
Activity 4: Menstrual cycle, its implications on exercise tolerance and sports performance	Week 10-12
Activity 5: Group work on main biomarkers related to training status. Elaboration of a document and presentation in the classroom.	Week 15
Activity 6. Final test (objective multiple-choice test)	Week 18

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

The recommended Bibliography is:

- McArdle W. Exercise Physiology: Nutrition, energy, and human performance. Williams & Wilkins,2010.
- López Chicharro J. Fisiología del Ejercicio. Ed. Panamericana, 2006.
- Bouchard C. Molecular and Cellular Regulation of Adaptation to Exercise. Progress in Molecular Biology and Translational Science. Vol. 135, Burlington: Academic Press, 2015, pp. 497-526. ISBN: 978-0- 12-803991-5
- Powers S. Exercise Physiology: Theory and application to fitness and performance. Ed. McGrawHill, 2007.
- Wilmore J. Physiology of Sport and Exercise. Human Kinetics, 2008.
- Coffey VG, Hawley JA (2007) The molecular bases of training adaptation. Sports Med 37:737-763.
- Burke L. Nutrición en el Deporte. Panamericana, 2010
- Smith D. Advanced Cardiovascular Exercise Physiology. Human Kinetics, 2011
- West J. Pulmonary physiology and pathophysiology: an integrated, case-based approach. 2007

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.