

1. OVERVIEW

Subject area	Physiology of Exercise II and Nutrition
Degree	Bachelor's Degree in Exercise and Sport Sciences
School/Faculty	Faculty of Exercise and Sport Sciences and Physiotherapy
Year	4
ECTS	6
Type	Optional
Language/s	Spanish/English
Delivery Mode	On campus
Semester	S-7 and S-8
Academic year	2023-2024
Coordinating professor	Elena Santana Sosa

2. INTRODUCTION

The importance of a proper diet in maintaining general overall health is now a well-established fact. As such, this subject area aims to give a general and basic overview for students to be able to give solid nutritional guidance and advice to the general public, especially in relation to physical activity.

The second part of the programme studies the physiological aspects, responses and adaptations in different groups of healthy people and people with illnesses who do physical exercise, and it explores the assessment of functional aerobic and anaerobic capacity through a range of case studies. Many decades have passed since professors Wasserman and McIlroy coined the term threshold of anaerobic metabolism. This term refers to a complex physiological event that we will try to understand over the course of the year.

This subject area explores in greater depth and expands on the knowledge developed in Physiology of Exercise I, including an in-depth study of the physiological aspects of special groups of people and their responses and adaptations to exercise. It also aims to explain the fundamental aspects of prevalent illnesses that can be prevented and treated with physical exercise, where precise knowledge of the illness is needed to adapt the exercise programme accordingly. In addition, and through the assessment of case studies, students will develop the necessary skills to understand the data that can be obtained from functional assessments and their application.

By the end of the year, students should be able to understand and recognise whether a diet is balanced in nutrients or not, understand the existing scientific evidence in relation to the best diet, understand assessment tools and know how to analyse, in the physiology of exercise laboratory, the physiological parameters for analysing performance and assessing physical fitness.

3. SKILLS AND LEARNING OUTCOMES

Learning outcomes (RA, by the acronym in Spanish):

- Specific applications of the physiology of exercise. To act professionally when using equipment and following safety protocols during laboratory work. Production of essays for the study of the advanced physiology of exercise and nutrition in sport. To produce in-depth analysis and summaries based on key literature about the advanced physiology of exercise and nutrition in sport.
- RA1. To understand, summarise, analyse and critique scientific articles
- RA 2. To understand scientific method
- RA3. Discussion of case studies: To know if a diet is balanced and to create a diet
- RA4. To use basic equipment in the physiology of exercise laboratory
- RA5. To interpret a laboratory test
- RA6. To know how to do up-to-date literature searches for subsequent use in professional development

The following table shows how the skills developed in the course match up with the intended learning outcomes:

Skills	Learning outcomes
CB2, CB3, CT01, CT12, CT08, CT12, CE07	RA1. To understand, summarise, analyse and critique scientific articles
CB3, CT01, CT04, CT12	RA 2. To understand scientific method
CB2, CB4, CT01, CT04, CT08, CT12, CE04, CE05	RA3. Discussion of case studies: To know if a diet is balanced and to create a diet
CB2, CT12, CE06	RA4. To use basic equipment in the physiology of exercise laboratory
CB2, CB3, CB4, CT04, CT08, CT12, CE04, CE06	RA5. To interpret a laboratory test
CB3, CT12, CT04, CT08, CE07	RA6. To know how to do up-to-date literature searches for subsequent use in professional development

4. CONTENTS

- 1.1. FUNCTIONAL ASSESSMENT: CONCEPT OF MAXIMAL OXYGEN CONSUMPTION (VO₂ MAX) – Practical/theory seminars (with laboratory work)
- 1.2. FUNCTIONAL ASSESSMENT: CONCEPT OF MUSCLE EFFICIENCY AND OXYGEN CONSUMPTION KINETICS IN SUBMAXIMAL EXERCISES – Practical/theory seminars (with laboratory work)
- 1.3. FATIGUE
- 1.4. CLINICAL PATHOPHYSIOLOGY OF EXERCISE. Theory and cases

5. TEACHING/LEARNING METHODS

The types of teaching-learning methods are as follows:

- Lectures
- Case studies
- Problem-based learning

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Lectures (on campus)	15
Asynchronous lectures (on campus)	8
Debates and discussions (on campus)	5
Searching for resources and choosing sources of information (on campus)	34
Essays, text commentaries and critical text analysis (on campus)	20
Group activities (seminars, forums) (on campus)	10
Case studies/workshop activities (on campus)	25
Tutorials (on campus)	8
Case studies (on campus)	25
TOTAL	150

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the course, are as follows:

Assessment system	Weighting
On-campus knowledge tests	60 (50–80)
Case study/problem	20 (10–20)
Assessment of reports and written work	20 (10–20)

On the Virtual Campus, when you open the subject area, you'll find details of your assessment activities, including the submission dates and assessment procedures for each activity.

7.1. Ordinary exam period

To pass the subject area in the ordinary exam period you must obtain a grade higher than or equal to 5.0 out of 10.0 in the final grade (weighted average) for the subject area.

In any case, you will need a grade of at least 5.0 in the final test for it to be included in the weighting with the other activities.

7.2. Extraordinary exam period (resits)

To pass the subject area in the extraordinary exam period, you must achieve a final grade of at least 5.0 out of 10.0 (weighted average) for the subject area.

In any case, it is necessary that you obtain a grade higher than or equal to 5.0 in the final exam, so that it can be averaged with the rest of the activities.

Any activities not passed in the ordinary exam period must be submitted after receiving the relevant corrections and feedback from the teacher. Students must also submit any activities that were not submitted in the first place.

8. TIMELINE

This section presents the timeline and submission dates for the assessable tasks in this subject area.

Assessable tasks	Date
Case study: Analysis and creation of a nutrition plan	Week 2
Group/individual creation and presentation of a nutrition project	Week 4
Group/individual creation and presentation of a project on the physiology of exercise	Week 8
Case study: Energy expenditure	Week 11
Case study: Effort test	Weeks 14–16
Case study: Advanced physiology of exercise	Week 18
OBJECTIVE TEST	Week 20

The timeline may be subject to change for logistical reasons related to the activities. Students will be informed of any changes in due time and course.

9. BIBLIOGRAPHY

Learning about the use of information in scientific tools: Publications in indexed international science journals (Science Citation Index (SCI) and MEDLINE): <http://www.ncbi.nlm.nih.gov/>

Bibliography on nutrition

1. Nutrición Deportiva Avanzada. Dan Benardot. 2ª Edición. Editorial Tutor, 2013.
2. Nutrition and Enhanced Sports Performance. Muscle Building, Endurance, and Strength Debasis Bagchi, Sreejayan Nair, Chandaan K. Sen. Elsevier, 2013.
3. Sports and Exercise Nutrición. William D. McArdle, Frank I Katch, Victor L. Katch. 4ª Edición. Lippincott Williams Wilkins, 2013.

4. American College of Sports Medicine Joint Position Statement. Nutrition and Athletic Performance. Thomas DT, Erdman KA, Burke LM (2016). *Med Sci Sports Exerc* 48:543-568.
5. American College of Sports Medicine position stand. Exercise and fluid replacement. Sawka MN, Burke LM, Eichner ER, Maughan RJ, Montain SJ, Stachenfeld NS (2007). *Med Sci Sports Exerc* 39:377-390. doi 10.1249/mss.0b013e31802ca597.
6. Moreiras O. y otros. (2005). "Tablas de composición de alimentos", 9ª Edición. Editorial Pirámide.
7. Nutriguía. Manual de nutrición Clínica en atención primaria. Ana M. Requejo, Rosa M. Ortega. Editorial Complutense, 2003

Bibliography on exercise physiology

8. McArdle W. Exercise Physiology: Nutrition, energy, and human performance. Williams & Wilkins, 2010.
9. López Chicharro J. Fisiología del Ejercicio. Ed. Panamericana, 2006.
10. 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
11. Egan B, Zierath JR (2013) Exercise metabolism and the molecular regulation of skeletal muscle adaptation. *Cell Metab* 17:162-184. doi S1550-4131(12)00503-7 [pii] 10.1016/j.cmet.2012.12.012.
12. Hawley JA, Hargreaves M, Joyner MJ, Zierath JR (2014) Integrative biology of exercise. *Cell* 159:738-749. doi S0092-8674(14)01317-8 [pii]
13. 10.1016/j.cell.2014.10.029.
14. Powers S. Exercise Physiology: Theory and application to fitness and performance. Ed. McGraw Hill, 2007.
15. Wilmore J. Physiology of Sport and Exercise. Human Kinetics, 2008.
16. Wolfram N. Nutrition and physical activity: Health Information Sources in EU Members States, and Activities in the Commission, WHO, and European Networks Springer, 2008.

Complementary bibliography.

17. Coffey VG, Hawley JA (2007) The molecular bases of training adaptation. *Sports Med* 37:737-763.
18. Burke L. Nutrición en el Deporte. Panamericana, 2010
19. Smith D. Advanced Cardiovascular Exercise Physiology. Human Kinetics, 2011
20. West J. Pulmonary physiology and pathophysiology: an integrated, case-based approach. 2007
21. Artículos de posicionamiento del American College of Sports Medicine en la revista *Medicine & Science in Sports and Exercise*

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. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degree courses and the learning process.

These surveys will be available in the surveys area of your virtual campus or by email.

Your opinion is essential to improve the quality of the course.

Many thanks for taking part.