1. OVERVIEW

Subject area	New Technologies Applied to Elite Performance in Sport
Degree	Bachelor's Degree in Exercise and Sport Sciences
School/Faculty	Exercise and Sport Sciences and Physiotherapy
Year	4
ECTS	6 ECTS
Type	Optional
Language/s	Spanish. English.
Delivery mode	On campus
Semester	S7 and S8
Academic year	2024/2025
Coordinating professor	Álvaro Bustamante Sánchez

2. INTRODUCTION

This subject area is designed for students to build the skills needed to work and develop professionally as elite performance coaches. The aim is to understand the latest technology available in the field of sports and to know how to use, identify and determine the most useful tools for professional coaches.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by the acronym in Spanish):

- CB3: To gather and interpret relevant data (usually within their area of study) to form opinions which include reflecting on relevant social, scientific or ethical matters.
- CB4: To convey information, ideas, problems and solutions to both specialist and non-specialist audiences.
- CB5: To develop the necessary learning skills to undertake further study with a high degree of autonomy.

Transversal skills (CT, by the acronym in Spanish):

- CT5: Ability to put knowledge into practice, using the skills acquired through the study of mock situations based faithfully on real life issues in the relevant profession.
- CT8: Information management: Ability to seek, choose, analyse and integrate information from diverse sources.
- CT14: Innovation/Creativity: Ability to propose and invent new, original solutions that contribute towards improving problem situations, including ideas from other contexts.
- CT18: Use of information and communication technology (ICT): Ability to effectively use information and communication technology as a tool for finding, processing and storing information, and for developing communication skills.

Specific skills (CE, by the acronym in Spanish):

- CE3: Ability to plan, programme, apply, monitor and assess training and competition processes at different levels and in different age groups.
- CE4: Ability to analyse and apply physiological, biomechanical, psychological and social principles in different areas of physical activity, sport and recreation.
- CE8: Ability to design, plan, organise, implement and evaluate regular and/or one-off sport and recreation programmes, considering all factors that might affect these programmes in different professional, social and economic contexts.

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

- RA1: To understand key concepts related to specific software and hardware.
- RA2: To understand and master key concepts for sports analysis.
- RA3: To act professionally when using equipment and following safety protocols during practical activities that involve different tools and equipment.
- RA4: To produce essays in order to study different sports.
- RA5: To produce in-depth analysis and summaries based on searches of key literature about new technologies.

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

Skills	Learning outcomes
CB3, CB5, CT5, CT18, CE3, CE4	RA1: To understand key concepts related to specific software and hardware.
CB3, CB5, CT5, CT18, CE3, CE4, CE8	RA2: To understand and master key concepts for sports analysis.
CB3, CB5, CT5, CT18	RA3: To act professionally when using equipment and following safety protocols during practical activities that involve different tools and equipment.
CB3, CB5, CT8, CT14, CT18	RA4: To produce essays in order to study different sports.
CB3, CB5, CT8, CT14, CT18	RA5: To produce in-depth analysis and summaries based on searches of key literature about new technologies.

4. CONTENTS

This section lists the content of each of the topics in the learning units.

- Observation and analysis of training and competition.
- Tools and instruments for observing, analysing and monitoring performance.
- Software for tactical and strategic analysis and for statistical monitoring of performance.
- Software for monitoring and planning training.
- GPS technologies
- Use of smartphones and tablets
- Control and assessment of training and competition.
- Control and assessment of effort: internal and external load.

- Control and assessment of behaviours.
- Control and assessment of performance: model for analysing performance in competitions.
- Future prospects.

The content will be divided into the following learning units.

- Topic 1: INTRODUCTION
- Topic 2: INFORMATION
- Topic 3: WEARABLES
- Topic 4: APPS
- Topic 5: SOFTWARE FOR SPORTS PLANNING
- Topic 6: GPS
- Topic 7: HEART RATE MONITORS
- Topic 8: MEASURING STRENGTH
- Topic 9: MEASURING JUMPING ABILITIES
- Topic 10: LATEST DEVELOPMENTS

5. TEACHING/LEARNING METHODS

The types of teaching-learning methods are as follows:

- Lectures.
- Case studies.
- Collaborative learning.
- Problem-based learning (ABP by its acronym in Spanish).
- Simulation environments.

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	18
Asynchronous lectures	8
Debates and discussions	10
Oral presentations	5
Essays, text commentaries and critical text analysis	36
Workshop and laboratory activities	25
Tutorials	8
Independent working	40
TOTAL	150 h

7. ASSESSMENT

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

On campus:

Assessment system	Weighting
Reflective journal	20% (15–25%)
Participation in classroom activities	20% (15–25%)
Oral presentations	20% (15–20%)
Laboratory work	20% (20–25%)
Assessment of reports and written work	20% (15–25%)

On the Virtual Campus, when you open the course, you can see all the details of your assessment activities and the deadlines 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.

You will need a grade of at least 5.0 in each practical activity to be eligible for continuous assessment.

You will need a grade of at least 5.0 in each practical activity and a grade of at least 5.0 in the objective knowledge test to be eligible for alternative assessment.

7.2. Extraordinary exam period (resits)

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.

You will need a grade of at least 5.0 in each practical activity.
You will need a grade of at least 5.0 in the objective knowledge test.

Activities not passed in the ordinary exam period, or those not submitted, must be submitted after receiving the relevant corrections and feedback from the lecturer.

8. TIMELINE

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

Assessable tasks	Date
To produce a report about the use of systems for measuring heat rate and heart rate variability.	September
To produce a report on the use of technology to assess training.	October
To produce a report on the use of technology to assess performance.	November
To produce a report on the use of technology to assess performance in order to manage training loads.	December

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

The reference material for the subject area is as follows:

- French, D., & Ronda, L. T. (Eds.). (2021). NSCA's Essentials of Sport Science. Human Kinetics.

The recommended bibliography is indicated below:

- Allen H, Coggan A (2006) Training and racing with a power meter. Boulder, Colorado. Velopress.
- Aughey RJ (2011a) Applications of GPS technologies to field sports. Int J Sports Physiol Perform 6(3): 295-310.
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- Duffield R, Reid M, Baker J, Spratford W (2010) Accuracy and reliability of GPS devices for measurement of movement patterns in confined spaces for court-based sports. J Sci Med Sport 13(5): 523-525.
- González Badillo JJ (1992) Metodología del entrenamiento para el desarrollo de la fuerza. Madrid. Comité Olímpico Español (COES)
- Lehman SL (1991) Measurement of lactate production by tracer techniques. Med Sci Sport Exerc 23: 935-938.
- Léger L, Boucher R (1980) An indirect continuous running multistage field test: the Université de Montréal track test. Can J Appl Sport Sci 5(2): 77-84.
- Lucía A, Hoyos J, Carvajal A, Chicharro JL (1999) Heart rate response to professional cycling: The Tour de France. Int J Sports Med 20: 167172.
- Jennings D, Cormack S, Coutts AJ, Boyd L, Aughey RJ (2010) The validity and reliability of GPS units for measuring distance in team sport specific running patterns. Int J Sports Physiol Perform 5(3): 328-341.
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- Svedahl K, McIntosh b (2003) Anaerobic threshold: the concept and methods of measurement. Can J Appl Physiol 28: 299-323.
- Tanner RK, Fuller KL, Ross ML (2010) Evaluation of three portable blood lactate analysers: Lactate Pro, Lactate Scout and Lactate Plus. Eur J Appl Physiol 109(3): 551-559.

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 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. STUDENT 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.