1. BASIC INFORMATION

Course	New Technologies Applied to High-Performance Sports
Degree program	Degree in Physical Activity and Sports Sciences
School	Physical Activity and Sports Sciences and Physiotherapy
Year	4th Year
ECTS	6 ECTS
Credit type	Elective
Language(s)	Spanish. English.
Delivery mode	In-person
Semester	S7 and S8
Academic year	2027-2028
Coordinating professor	Álvaro Bustamante Sánchez

2. PRESENTATION

This course aims to equip students with the necessary competencies for professional development and practice as high-performance sports coaches. The objective is to familiarize students with the latest technologies available in the field of sports and to develop the ability to use, identify, and discern the most useful ones for a coach's professional activities.

3. LEARNING OUTCOMES

Knowledge

KON4. Identifies strategies and initiatives to promote healthy habits through physical activity and sport and/or auxiliary actions that help to maintain and improve physical condition.

- Identifies the key concepts for sports analysis.

Skills

SK02. Plans physical exercise activities, progressions and strategies to promote health and sports performance based on individual and environmental factors.

- Analyses the key concepts of specific software and hardware.
- Employs professional conduct and protocols using the relevant equipment for activities that require different apparatus and equipment.
- Uses methodologies for studying the different sports.
- Carries out in-depth studies and syntheses based on research using fundamental bibliographical sources related to the management of sports teams and clubs.
- Evaluates tests for the assessment and management of physical fitness and sports performance.

Competences

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.
COMP26. Adopt a rigorous and scientific approach to develop and draw on the justification needed to produce, support, defend and justify, in a consistent and professional manner, all acts, decisions, processes, procedures, initiatives, activities, tasks, conclusions, reports and professional performance.
COMP38. Digital competence. Use information and communication technologies to search for and analyze data, research, communicate and learn.
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: Contextualisation, wearables and apps
Topic 2: Planning software
Topic 3: Assessment of resistance and speed
Topic 4: Assessment of strength and jumping
Topic 5: Assessment of psychophysiological responses
Topic 6: Latest developments

5. TEACHING-LEARNING METHODOLOGIES

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

- Lecture
- Workshop/Laboratory-based learning
- Simulation environments

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
Lectures	12
Practical application classes	18
Independent work	56
Debates and discussions	8
Tutoring	12
In-person assessments	2

Report and writing preparation	22
Workshop and/or laboratory activities	20
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
In-person assessments	40-50%
Workshop/Laboratory-based learning	45-50%
Reports and written assignments	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 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
Prepare a report on the use of heart rate measurement systems and heart rate variability.	September
Prepare an evaluation report on training using technology.	October
Prepare an evaluation report on performance using technology.	November
Prepare an evaluation report on performance using technology for athlete load monitoring.	December

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

9. BIBLIOGRAPHY

The main reference work for this subject is:

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

The recommended Bibliography is:

- 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.
- Bosco C (1998) A new ergopower training method. The Bosco system. Modern Athlete & Coach 36(4): 13-16
- 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.

- Sánchez Medina L, González Badillo JJ (2011) Velocity loss as an indicator of neuromuscular fatigue during resistance training. Med Sci Sports Exerc 43(9): 1725-1734
- 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, DIVERSITY AND INCLUSION UNIT

From the Educational Guidance, Diversity and Inclusion 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 mean 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 opportunity 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 on virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.