Information about the subject

Degree: Bachelor of Sciences of Physical Activity and Sport

Faculty: Faculty of Physical Activity and Sport Sciences

Code: 281202 **Name:** Physiology of Exercise

Credits: 6,00 **ECTS Year:** 2 **Semester:** 1

Module: 1) Basic formation Module

Subject Matter: Biological and mechanical foundations of human motor skills. **Type:** Basic Formation

Field of knowledge: Ciencias de la Salud.

Department: -

Type of learning: Classroom-based learning

Languages in which it is taught:

Lecturer/-s:

282A	Gustavo Daniel Represas Lobeto **(Responsible Lecturer)**	gd.represas@ucv.es
282B	Carlos Sanchis Sanz **(Responsible Lecturer)**	carlos.sanchis@ucv.es
282C	Carlos Sanchis Sanz **(Responsible Lecturer)**	carlos.sanchis@ucv.es
282D	Leandro Ferreira Moraes **(Responsible Lecturer)**	leandro.ferreira@ucv.es
282X	Carlos Sanchis Sanz **(Responsible Lecturer)**	carlos.sanchis@ucv.es

Module organization

1) Basic formation Module

Subject Matter	ECTS	Subject	ECTS	Year/semester
Biological and mechanical foundations of human motor skills.	36,00	Biochemistry and Human Physiology	9,00	1/2
		Biomechanics of Physical Activity	6,00	2/1
		Human Anatomy	9,00	1/2
		Kinesiology	6,00	2/1
		Physiology of Exercise	6,00	2/1
Behavioral and social foundations of human motor skills.	24,00	History and Sociology of Physical Activity and Sport	6,00	1/2
		Sport Psychology	6,00	1/2
		Statitics and Data Processing	6,00	2/2
		Technology Applied to Physical Activity and Sport	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 Identify, interpret and explain the processes, responses and physiological adaptations of the human body to physical activity.

R2 Analyze, contrast and critically synthesize various sources of documentary information in English on the physiological processes and adaptations that occur during physical activity, as well as show the result of said process.

R3 Solve exercises or practical cases related to the physiological response in conditions of rest and / or physical exercise, thanks to the experimentation and measurement of the response of different variables.

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):

GENERAL		Weighting			
		1	2	3	4
CG1	Understand the scientific literature in English and in other languages ??of significant presence in the scientific field through proper information management.		x		
CG2	Know how to apply information and communication technologies (ICT).	x			
CG3	Develop skills to solve problems through decision making.	x			
CG4	Convey any related information properly both in writing and orally.			x	
CG5	Plan and organize any activity efficiently.			x	
CG6	Develop interpersonal relationship skills and teamwork, both in international and national contexts and in interdisciplinary as well as non-interdisciplinary teams.		x		
CG7	Be able to carry out critical reasoning using the knowledge acquired.				x
CG8	Recognize multiculturalism and diversity.	x			
CG9	Know and act within the ethical principles necessary for proper professional practice.		x		
CG10	Develop skills for adaptation to new situations and for autonomous learning.	x			
CG11	Develop skills for creativity, initiative and entrepreneurship.	x			
CG13	Be able to apply theoretical knowledge in practice.				x
CG14	Use the internet properly as a means of communication and as a source of information.	x			

CG15	Transmit the knowledge acquired both to people specialized in the matter and to people not specialized in The subject in question.			x	
CG16	Understand the proposals of other specialists and communicate with them, both in their language and in a second language foreign.	x			
CG18	Be able to self-evaluate.	x			
CG19	Develop habits of excellence and quality in professional practice.		x		

SPECIFIC		Weighting			
		1	2	3	4
CE 2.1	Adapt the educational intervention to the individual characteristics and needs for the entire population and with emphasis on special populations such as: schoolchildren, the elderly (elderly), people with reduced mobility and Know how to guide, design, apply and technically-scientifically evaluate physical exercise and physical condition at an advanced level, based on scientific evidence, in different areas, contexts and types of activities for the entire population and with an emphasis on populations of a special nature such as: the elderly (elderly), schoolchildren, people with disabilities and people with pathologies, health problems or assimilated (diagnosed and / or prescribed by a doctor), taking into account gender and diversity. diversity.	x			
CE 2.2	Identify, communicate and apply anatomical-physiological and biomechanical scientific criteria at an advanced level of skills in the design, development and technical-scientific evaluation of procedures, strategies, actions, activities and guidelines adequate; to prevent, minimize and / or avoid a health risk in the practice of physical activity and sport in all kinds of population.				x
CE 3.4	Promote education, dissemination, information and constant orientation to people and leaders about the benefits, significance, characteristics and positive effects of the regular practice of physical and sports activity and physical exercise, of the risks and damages of an inadequate practice and of the elements and criteria that identify its adequate execution, as well as the information, guidance and advice on the possibilities of physical activity and appropriate sport in your environment in any professional intervention sector.				x

CE 6.2	Analyze, review and select the effect and efficacy of the practice of research methods, techniques and resources and Scientific work methodology, in solving problems that require the use of creative and innovative ideas.		x
CE 6.4	Articulate and deploy procedures, processes, protocols, own analysis, with rigor and scientific attitude on matters of social, legal, economic, scientific or ethical nature, when necessary and pertinent in any professional sector of activity physical and sport (formal and informal physical-sport education; physical and sports training; physical exercise for health; direction of physical activity and sport).	x	
CE 7.2	Know, elaborate and know how to apply the ethical-deontological, structural-organizational conditions, professional performance and the regulations for the professional practice of Graduates in Physical Activity and Sports Sciences, in any sector professional of physical activity and sports (formal and informal physical-sports education; physical and sports training; exercise physical for health; direction of physical activity and sports); as well as being able to develop a multidisciplinary work	x	
CE 7.3	Understand, know how to explain and disseminate the functions, responsibilities and importance of a good professional Graduated in Sciences of Physical Activity and Sports as well as analyze, understand, identify and reflect critically and autonomously on their identity, training and professional performance to achieve the goals and benefits of physical activity and sport in an adequate, safe, healthy and efficient way in all the physical-sports services offered and provided and in any sector professional of physical activity and sports.	x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3	20,00%	Carrying out a project.
R1, R2, R3	60,00%	Written / oral and / or practical tests.
R1, R2, R3	20,00%	Attendance at interviews, seminars and practical activities.

Observations

·The student will be able to keep the evaluation instruments passed during the 3 years following the first enrollment.
·It is necessary to obtain a 50% in the following instruments (if this criterion is not fulfilled, the student will be graded with a maximum of 4.5 in that exam):
·Written/oral and/or practical tests
·Project developement
·Active participation
·The project requires attendance at two thirds of the group work sessions in the classroom, as part of the correct development of group work. In these sessions each group must complete the proposed tasks.

Learning activities

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

M2 Group dynamics and activities.

M3 Practical lesson.

M4 Presentation of content by the teacher.

M5 Laboratory practices.

M7 Small group discussion.

M8 Resolution of problems and cases.

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
THEORETICAL CLASS: Presentation of contents by the teacher. Competency analysis. Demonstration of capabilities, skills and knowledge in the classroom. M4	R1, R2, R3	28,00	1,12
PRACTICAL CLASS / SEMINAR: Group dynamics and activities. Resolution of problems and cases. Practical laboratories. Data search, computer room, library, etc. Meaningful construction of knowledge through interaction and student activity. M2, M3, M5, M7	R1, R2, R3	24,00	0,96
TUTORING: Supervision of learning, evolution. Small group discussion. Resolution of problems and cases. Presentation of results before the teacher. Presentation of diagrams and indexes of the proposed works. M4	R1, R2, R3	4,00	0,16
EVALUATION: Set of oral and / or written tests used in the evaluation of the student, including the oral presentation of the final degree project. M2, M7	R1, R2, R3	4,00	0,16
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK: Problem solving. Preparation of exercises, memoirs, to expose or deliver in classes and / or in tutoring. M2, M7	R1, R2, R3	37,50	1,50
SELF-EMPLOYED WORK: Study, individual preparation of exercises, works, memories, to expose or deliver in classes and / or in tutoring. Platform activities or other virtual spaces. M8	R1, R2, R3	52,50	2,10
TOTAL		**90,00**	**3,60**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
1 Skeletal muscle: Responses and adaptations to physical exercise.	1 Skeletal muscle: Responses and adaptations to physical exercise.
2 Energy metabolism: Responses and adaptations to physical exercise.	2 Energy metabolism: Responses and adaptations to physical exercise.
3 Responses and adaptations of the cardiovascular system to physical exercise.	3 Responses and adaptations of the cardiovascular system to physical exercise.
4 Responses and adaptations of the respiratory system to physical exercise.	4 Responses and adaptations of the respiratory system to physical exercise.
5 Responses and adaptations of the endocrine system to exercise.	5 Responses and adaptations of the endocrine system to exercise.
6 Aerobic to anaerobic transition. Concept and assessment of the anaerobic threshold.	6 Aerobic to anaerobic transition. Concept and assessment of the anaerobic threshold.
7 Physiological aspects in different populations: female athletes, childhood, adolescence and the elderly.	7 Physiological aspects in different populations: female athletes, childhood, adolescence and the elderly.

Temporary organization of learning:

Block of content	Number of sessions	Hours
1 Skeletal muscle: Responses and adaptations to physical exercise.	5,00	10,00
2 Energy metabolism: Responses and adaptations to physical exercise.	6,00	12,00
3 Responses and adaptations of the cardiovascular system to physical exercise.	4,00	8,00
4 Responses and adaptations of the respiratory system to physical exercise.	4,00	8,00
5 Responses and adaptations of the endocrine system to exercise.	2,00	4,00
6 Aerobic to anaerobic transition. Concept and assessment of the anaerobic threshold.	5,00	10,00
7 Physiological aspects in different populations: female athletes, childhood, adolescence and the elderly.	4,00	8,00

References

BASIC BIBLIOGRAPHY:

Astrand, P. O. y Rodahl, K. (2010). *Fisiología del Trabajo Físico*. Médica Panamericana.

Barbany, J.R. (1990). *Fundamentos de fisiología del ejercicio y del entrenamiento*. Barcanova.

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Cheung, S. S., & Ainslie, P. N. (2021). *Advanced environmental exercise physiology*. Human Kinetics.

Córdova A. y Navas F. (2000) *Fisiología Deportiva*. Gymnos.

Fox, E. L. (1995). *Fisiología del Deporte*. Médica Panamericana.

Guyton, H. (2001). *Tratado de Fisiología Médica*. McGraw–Hill Interamericana.

Kenney, W. L., Wilmore, J., & Costill, D. (2015). *Physiology of Sport and Exercise.* 6th Edition. Human Kinetics.

López Chicharro, J. y Fernández Vaquero, A. (2006). *Fisiología del ejercicio*. Médica Panamericana.

MacDougall, J., Wenger, H. y Green, H. (2005). *Evaluación fisiológica del deportista*. Paidotribo.

McArdle W. D., Katch F. I. y Katch V. L. (2004). *Fundamentos de Fisiología del Ejercicio.* McGraw-Hill. Interamericana.

McArdle, W. D., Katch, F. I., & Katch, V. L. (2014). *Exercise Physiology: Nutrition, Energy and Human Performance*. Lippincott Williams & Wilkins.

Meri, A. (2005). *Fundamentos de Fisiología de la Actividad Física y el Deporte*. Medica Panamericana.

Mora-Rodríguez, R., Pallarés, J. y Ortega, J. (2020). *Fisiología del deporte y el ejercicio Prácticas de campo y laboratorio*. Médica Panamericana.

Mooren, F., & Völker, K. (Eds.). (2005). *Molecular and cellular exercise physiology.* Human Kinetics.

Silbernagl, S. y Despopolous, A. (2009). *Fisiología: Texto y Atlas*. Médica Panamericana.

Terreros J.L. y Navas F. (2003). *Valoración funcional (Aplicaciones al entrenamiento deportivo).* Gymnos.

Tresguerres, J.A.F. (1999). *Fisiología Humana*. McGraw–Hill Interamericana.

Wilmore, J.H. y Costill, D.L. (2007). *Fisiología del esfuerzo y del deporte*. Paidotribo.

RESEARCH ARTICLE JOURNAL:

·Medicine and Science in Sports and Exercise
·International Journal of Sport Nutrition and Exercise Metabolism
·Exercise and Sport Sciences Reviews
·Journal of Sport & Exercise Psychology
·Journal of Applied Physiology
·European Journal of Applied Physiology

Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☐ Microsoft Teams

☐ Kaltura

Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☐ Microsoft Teams

☐ Kaltura

Explanation about the practical sessions:

2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

[X] The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

[ ] The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: