



Information about the course

Degree: Bachelor of Sciences of Physical Activity and Sport

Faculty: Faculty of Physical Activity and Sport Sciences

Code: 281102 **Name:** Biochemistry and Human Physiology

Credits: 9,00 ECTS **Year:** 1 **Semester:** 2

Module: 1) Basic Training Module

Subject Matter: Biological and Mechanical Foundations of Human Motor Skills **Type:** Formación

Básica

Branch of knowledge: Health Sciences

Department: Basic Sciences and Cross-disciplinary Subjects

Type of learning: Classroom-based learning

Language/-s in which it is given: Spanish

Teachers:

116PG	<u>Juan Bautista Miñana Serrano</u> (Profesor responsable)	jb.minana@ucv.es
281A	<u>Maria Angeles Navarro Moreno</u> (Profesor responsable)	angeles.navarro@ucv.es
281B	<u>Maria Angeles Navarro Moreno</u> (Profesor responsable)	angeles.navarro@ucv.es
281C	<u>Maria Angeles Navarro Moreno</u> (Profesor responsable)	angeles.navarro@ucv.es
281D	<u>Maria Angeles Navarro Moreno</u> (Profesor responsable)	angeles.navarro@ucv.es
281X	<u>Juan Bautista Miñana Serrano</u> (Profesor responsable)	jb.minana@ucv.es



Module organization

1) Basic Training Module

Subject Matter	ECTS	Subject	ECTS	Year/semester
Biological and Mechanical Foundations of Human Motor Skills	36	Biochemistry and Human Physiology	9	1/2
		Biomechanics of Physical Activity	6	2/1
		Human Anatomy	9	1/2
		Kinesiology	6	2/1
		Physiology of Exercise	6	2/1
Behavioral and social foundations of human motor skills.	24	History and Sociology of Physical Activity and Sport	6	1/2
		Sport Psychology	6	1/2
		Statistics and Data Processing	6	2/2
		Technology Applied to Physical Activity and Sport	6	1/1



Learning outcomes

Al finalizar la asignatura, el estudiante deberá demostrar haber adquirido los siguientes resultados de aprendizaje:

R7 - Recognize, interpret, and explain physiological processes occurring in the human body.

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

- Analyze, identify, diagnose, promote, guide and evaluate strategies, actions and activities that encourage adherence to an active lifestyle and the participation and regular and healthy practice of physical activity and sport and physical exercise in an adequate, efficient and safe by citizens with the purpose of improving their comprehensive health, well-being and quality of life, and with emphasis on special populations such as: older people (senior citizens), schoolchildren, people with disabilities and people with pathologies, health or assimilated problems (diagnosed and/or prescribed by a doctor) taking into account gender and diversity.
- Apply the principles derived from the concept of integral ecology in your proposals or actions, whatever the scope and area of knowledge and the contexts in which they are proposed.
- Develop and implement the technical-scientific evaluation of the elements, methods, procedures, activities, resources and techniques that make up the manifestations of movement and the processes of physical condition and physical exercise; taking into account the development, characteristics, needs and context of individuals, the different types of population and the spaces where physical activity and sport are carried out; in the various sectors of professional intervention and with emphasis on special populations.
- Develop theoretical-practical responses based on the sincere search for the full truth and the integration of all dimensions of the human being when faced with the great questions of life.
- Identify, communicate and apply scientific anatomical-physiological and biomechanical criteria at an advanced level of skills in the design, development and technical-scientific evaluation of appropriate procedures, strategies, actions, activities and guidelines; to prevent, minimize and/or avoid a health risk in the practice of physical activity and sport in all types of population.
- 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 emphasis on specific populations. special such as: older people (seniors), 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.



- Respect and put into practice the ethical principles and action proposals derived from the objectives for sustainable development, transferring them to all academic and professional activities.

Type of AR: Conocimientos o contenidos

- Know and understand the bases of the methodology of scientific work.

Type of AR: Competencias

- Analyze, review and select the effect and effectiveness 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.
- Articulate and display an advanced level of skill in the analysis, design and evaluation of assessment and control tests of physical condition and physical-sports performance.
- Promote education, dissemination, information and constant guidance to people and leaders on the benefits, significance, characteristics and positive effects of the regular practice of physical and sports activity and physical exercise, and the risks and harms of inadequate practice. and the elements and criteria that identify its adequate execution, as well as information, guidance and advice on the possibilities of appropriate physical activity and sport in its environment in any sector of professional intervention.

R8 - Measure and interpret physiological parameters.

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

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- Apply the principles derived from the concept of integral ecology in your proposals or actions, whatever the scope and area of knowledge and the contexts in which they are proposed.



- Develop and implement the technical-scientific evaluation of the elements, methods, procedures, activities, resources and techniques that make up the manifestations of movement and the processes of physical condition and physical exercise; taking into account the development, characteristics, needs and context of individuals, the different types of population and the spaces where physical activity and sport are carried out; in the various sectors of professional intervention and with emphasis on special populations.
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R9 - Use bibliographic information sources (both in Spanish and English) related to human physiology appropriately.

Learning outcomes of the specified title

Type of AR: Habilidades o Destrezas

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Type of AR: Conocimientos o contenidos

- Know and understand the bases of the methodology of scientific work.

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Assessment system

Modalidad presencial

Assessed learning outcomes	Granted percentage	Assessment tool
R7, R8	60,00%	Written and/or practical tests.
R7, R8, R9	40,00%	Exercises and Practices in the Classroom.

Observations

- In the written and/or practical tests of the subject, there may be eliminatory partial exams of the subject. These will consist of 50 multiple-choice questions, with four answer options, only one of which is true.

- If the student fails the midterm or fails both midterms, he/she will have an exam of 75 multiple-choice questions, with four answer options, only one of which is true.

- A compulsory attendance of 70% of the sessions is required.

- The student may keep the assessment instruments passed during the 3 years following the first registration.

- It is necessary to obtain 45% in all the instruments to pass the subject. The resulting mark for all the instruments must be equal to or higher than 50% to pass the course.

- If any of these criteria is not met, the student will be graded with a maximum of 4.5.

- This subject is NOT eligible for single assessment according to article 10.3 of the GENERAL RULES FOR ASSESSMENT AND GRADING OF OFFICIAL COURSES AND UCV's OWN DEGREES.

The detailed explanation (procedure of the tasks) as well as the evaluation instruments (cards or rubrics) of each section will be published on the platform of each group at the student's disposal.



Use of Artificial Intelligence Tools in the CAFD Degree Program

Use of Artificial Intelligence tools in the CAFD degree program In the Bachelor's Degree in Physical Activity and Sports Sciences (CAFD), the use of Artificial Intelligence (AI) tools is permitted in a complementary and responsible manner, as long as it contributes to active learning, the development of critical thinking, and the improvement of students' professional skills. Under no circumstances should AI replace personal effort, direct practice, or independent reflection, which are fundamental pillars of this degree program.

Permitted Uses of AI:

- Obtaining alternative explanations of theoretical or methodological concepts.
- Generating outlines, concept maps, or summaries to support study.
- Simulating interviews, questionnaires, or training sessions as part of methodological or research practices.
- Receiving feedback on report writing, provided that the original content is the student's own.
- Supporting the search for bibliography or scientific references, always contrasting with reliable and real academic sources, and respecting the CAFD regulations for the presentation of university work.

Prohibited Uses of AI:

- Writing complete sections of academic papers, classroom exercises and practices, internship reports, journals, or portfolios, as well as the Final Degree Project.
- Formulating hypotheses, objectives, or conclusions for academic work.
- Replacing qualitative or quantitative data analysis with automated tools without human validation.
- Creating videos, presentations, or avatars with AI as a substitute for the student's oral or practical presentation.
- Obtaining automatic answers to tests, rubrics, or assessable activities through the use of AI.

Citation and Attribution Guidelines:

- Any use of AI tools must be explicitly acknowledged in the submitted document (e.g., in a footnote or appendix).
- The name of the tool, the purpose of use (e.g., grammatical review, organization of ideas, interview simulation), and where it was used in the work must be indicated.
- Responsible use of AI will be evaluated within the framework of originality, academic honesty, and digital competence.

Additional recommendations:

Students are encouraged to combine the use of AI with traditional methods (manual problem solving, practical session design, direct observation, etc.) to ensure the comprehensive development of their skills.



If there are any doubts about the permitted use of AI in a specific activity, students should consult the faculty responsible for the course.

Actividades formativas

The methodologies to be used so that the students reach the expected learning outcomes will be the following:

- M2 Resolution of problems and cases.
- M3 Discussion in small groups.
- M5 Presentation of content by the teacher.
- M6 Practical lesson.
- M7 Group dynamics and activities.

IN-CLASS TRAINING ACTIVITIES

ACTIVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
THEORETICAL CLASS: Presentation of contents by the teacher. Competency analysis. Demonstration of capabilities, skills and knowledge in the classroom.	R7, R8	Discussion in small groups. Presentation of content by the teacher. Group dynamics and activities.	82,00	3,28



PRACTICAL CLASS / SEMINAR: Group dynamics and activities. Resolution of problems and cases. Practical laboratories. Data search, computer classroom, library, etc. Meaningful construction of knowledge through student interaction and activity.	R7, R8	Resolution of problems and cases. Discussion in small groups. Practical lesson. Group dynamics and activities.	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.	R7, R8, R9	Resolution of problems and cases. Group dynamics and activities.	4,00	0,16
TOTAL			90,00	3,60

TRAINING ACTIVITIES OF AUTONOMOUS WORK

ACTIVITY	RELATIONSHIP WITH THE COURSE LEARNING OUTCOMES	METHODOLOGY	HOURS	ECTS
GROUP WORK: Problem solving. Preparation of exercises, memoirs, to present or deliver in classes and/or in tutoring.	R7, R8, R9	Resolution of problems and cases. Group dynamics and activities.	30,00	1,20
SELF-EMPLOYED WORK: Study, Individual preparation of exercises, assignments, reports, to present or deliver in classes and/or in tutoring. Activities in platform or other virtual spaces.	R7, R8, R9	Resolution of problems and cases.	105,00	4,20
TOTAL			135,00	5,40



Description of contents

Descripción de contenidos necesarios para la adquisición de los resultados de aprendizaje.

Theoretical content:

Block of content	Contents
1. Introduction to Biochemistry	Introduction to Biochemistry
2. Main molecules of biological interest	2.1. Carbohydrates 2.2. Lipids 2.3. Proteins
3. Metabolism	3.1. Introduction to metabolism 3.2. Metabolism of carbohydrates 3.3. Metabolism of lipids 3.4. Protein metabolism
4. Enzymes	Enzymes
5. Integration of metabolism	Integration of metabolism
6. Flow of genetic information	Flow of genetic information
7. Clinical biochemistry	Clinical biochemistry
8. Vitamins	Vitamins
9. Membranes and transport systems	Membranes and transport systems
10. Physiology of the circulatory system	Physiology of the circulatory system
11. Physiology of the respiratory system	Physiology of the respiratory system
12. Physiology of the digestive system	Physiology of the digestive system
13. Physiology of the endocrine system	Physiology of the endocrine system



14. Physiology of the muscular system

Physiology of the muscular system

15. Physiology of the nervous system

Physiology of the nervous system

16. Physiology of the renal system

Physiology of the renal system



Temporary organization of learning:

Block of content	Sessions	Hours
1. Introduction to Biochemistry	2	3,00
2. Main molecules of biological interest	7	14,00
3. Metabolism	7	14,00
4. Enzymes	2	3,00
5. Integration of metabolism	2	3,00
6. Flow of genetic information	2	3,00
7. Clinical biochemistry	2	3,00
8. Vitamins	2	3,00
9. Membranes and transport systems	2	3,00
10. Physiology of the circulatory system	5	9,00
11. Physiology of the respiratory system	3	5,00
12. Physiology of the digestive system	2	3,00
13. Physiology of the endocrine system	3	6,00
14. Physiology of the muscular system	4	8,00



15. Physiology of the nervous system	3	5,00
16. Physiology of the renal system	3	5,00

References

- Abali, E., Cline, S., Franklin, D. y Viselli, S. (2021). Bioquímica (Lippincott Illustrated Reviews Series). (7ª ed). Wolters Kluwer.
- Feduchi, E., Romero, C., Yáñez, E. y García-Hoz, C. (2021). Bioquímica. Conceptos esenciales. (3º ed). Elsevier.
- Hall, J.E. y Hall, J.E. (2021). Guyton & Hall. Tratado de Fisiología Médica. Elsevier
- Hall, S. y Stephens, J. (2020). Lo esencial en Anatomía y Fisiología. Elsevier
- Calderón, F.J. (2019). Fisiología Humana. Aplicación a la actividad física. Editorial Médica Panamericana
- Costanzo, L.S. y Costanzo, L.S. (2018). Fisiología. Elsevier
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- Koepppe, B.M. y Stanton, B.A. (2018). Berne y Levy. Fisiología. Elsevier
- Tortora, G.J. y Derrickson, B. (2017). Principios de Anatomía y Fisiología (15ª ed.). Editorial Médica Panamericana
- Teijón, J.M., Blanco, M.D., Olmo, R.M., Posada, P., Teijón, C. y Villarino, A. (2016). Fundamentos de bioquímica metabólica. Tébar Flores
- Herrera, E., Ramos, M.P., Roca, P. y Viana, M.M. (2014). Bioquímica Básica. Elsevier