



Information about the subject

Degree: Bachelor of Sciences of Physical Activity and Sport

Faculty: Faculty of Physical Activity and Sport Sciences

Code: 280302 **Name:** Biomechanics of Physical Activity

Credits: 6,00 **ECTS Year:** 3 **Semester:** 2

Module: 2) Knowledge of Basic Discipline module.

Subject Matter: Biological and Mechanics Basis of Human Movement **Type:** Compulsory

Field of knowledge: Health and functional assessment

Department: -

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

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Lecturer**)

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Module organization

2) Knowledge of Basic Discipline module.

Subject Matter	ECTS	Subject	ECTS	Year/semester
Science and Human Movement.	6,00	Learning and Motor Development	6,00	1/2
Manifestations of the human motor	12,00	Body Language	6,00	1/2
		Perceptual-Motor Skills	6,00	2/1
Applied basis o sports	36,00	Adapted Sport and Physical Activity with Specific Educational Needs	6,00	3/1
		Adversary Sports	6,00	3/2
		Collective Sports	6,00	2/2
		Individual Sports	6,00	2/1
		Local Games and Sports	6,00	2/2
		Sport in the Natural Environment	6,00	3/2
Biological and Mechanics Basis of Human Movement	18,00	Biomechanics of Physical Activity	6,00	3/2
		Kinesiology	6,00	2/1
		Physiology of Exercise	6,00	2/2



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 Acquiring basic theory knowledge.
- R2 Learning to work together.
- R3 Searching information to personalize and increase theoretical contents of biomechanics.
- R4 Learning to use different types of tools, techniques, methodologies and protocols related to biomechanics.
- R5 Learning to adapt instruments, techniques and methodologies to the biomechanics necessities.
- R6 Learning to describe, analyze and evaluate protocols for applied techniques in biomechanics.
- R7 Learn to orally present a work
- R8 Learning to summarize and organize the information.
- R9 Learning to express writing the acquired knowledge.
- R10 Learning to carry out self-assessment about theory and practice work.



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
CG2	Ability to apply information technology and communication (ICT)			X	
CG3	Develop skills to solve problems through decision-making			X	
CG4	Transmit any information regarding the contents of body expression both in writing and orally		X		
CG7	Be capable of critical reasoning using the knowledge gained			X	
CG10	Develop skills to adapt to new situations and autonomous learning			X	
CG13	Being able to apply theoretical knowledge in practice				X
CG14	Use Internet well as communication and as a source of information			X	
CG18	Being able to assess themselves	X			
CG19	Developing habits aiming at obtaining excellence and quality at work		X		
SPECIFIC		Weighting			
		1	2	3	4
CE1	Knowing and understanding the contents within the scope of Physical Activity and Sports Science		X		
CE3	Knowing and understanding the physiological and biomechanical factors determining physical activity and sports				X
CE5	Know and understand the effects of the practice of body language and its manifestations in the personal development and health improvement		X		



CE18 Select and know how to use the most appropriate teaching materials and resources for each type of activity

x

CE19 Learn to apply the techniques of information and communication within the body expression

x

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1	90,00%	Written/oral and/or practical tests.
R10	10,00%	Participation and self-assessment.

Observations

Short guide of the subject in first enrolment:

- In order to passing the subject, it is necessary to have a minimum mark of 4.5 of each part of the subject (assessment tools), obtaining an average mark of 5.
- Partial marks obtained will be kept for the second enrolment.
- Students with a failing grade in some of the assessment tools, but an average mark higher than 5, will be graded with a mark of 4.5.

Learning activities

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

- M1 Exhibition of contents by the teacher.
- M2 Dynamics and group activities.
- M3 Resolution of problems and cases.



M5 Discussion in small groups.

M6 Practical lesson.



IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
PRACTICAL /SEMINAR CLASS: Dynamics and group activities. Resolution of problems and cases. Laboratory practices. Data search in a computer room, library... Meaningful construction of knowledge through the interaction and activity of the student M2, M3, M5, M6	R1, R2, R3, R4, R5, R6	16,50	0,66
TUTORY: Learning supervision, evolution. Discussion in small groups. Resolution of problems and cases. Presentation of results before the teacher. Presentation of schemes and indexes of the proposed works. M5	R1, R3, R9, R10	2,00	0,08
EVALUATION: Set of oral and / or written tests used in the evaluation of the student, including the oral presentation of the final project. M2, M3	R1, R8, R9, R10	4,00	0,16
THEORETICAL CLASS: Presentation of content by the teacher. Competency analysis. Demonstration of skills, abilities and knowledge in the classroom. M1, M2, M5	R1, R4, R5	37,50	1,50
TOTAL		60,00	2,40



LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
GROUP WORK: Problem solving. Preparation of exercises, works, memories, to exhibit or deliver in classes and / or in tutoring. M2, M3	R1, R2, R3, R8, R10	35,00	1,40
AUTONOMOUS WORK: Study, Individual preparation of exercises, works, memories, to exhibit or deliver in classes and / or in tutoring. Platform activities or other virtual spaces. M3	R1, R3, R6, R9, R10	55,00	2,20
TOTAL		90,00	3,60



Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
T.1.- CONCEPT AND AREA OF STUDY.	Study of basic biomechanical contents such as: - Historical precedents and precursors.- Aims of the sport biomechanics.- Applied areas.- Sport biomechanics in Spain.- Topics related to the biomechanics.
T.2.- MATHEMATICAL AND PHYSICAL BASIS FOR HUMAN ANALYSIS.	- General concept: measurement, measurement units, magnitudes and trigonometric functions...- Resolution of basic mathematical situations: vectorial and trigonometric operations...
T.3.- HUMAN MOVEMENT: BASIS OF THE MECHANICS.	- Study and analysis of the mechanics (applied and component):- Kinematic (lineal and angular). Concept and application by practice situations and problems resolution.- Dynamic (Kinetic and Static). Concept, laws and problems resolution.
T.4.- AIR AND AQUATIC ENVIRONMENT.	- Basic concepts: Form coefficient, boundary layer and outline.- Resistance assessment:- Types of resistance.- Lift forces (air).- Buoyancy forces (aquatic).
T.5.- MOVEMENT ENERGY: WORK, POWER AND ENERGY.	Study, analysis and concept measurement:- Work.- Power.- Potential, kinetic and elastic energy.- Mechanical efficiency.- Simple machines: lever and pulley.- Kinetic links.
T.6.- MECHANICAL CHARACTERISTICS OF MATERIALS.	- Mechanical study and analysis of materials:- Basic concept: deformation, tension, elasticity, stiffness, flexibility, restitution and fatigue.- Mechanical characteristics of biological materials.- Mechanical characteristics of sport surfaces.- Sport surface classification.- Theoretical aspects in normalized test.



Temporary organization of learning:

Block of content	Number of sessions	Hours
T.1.- CONCEPT AND AREA OF STUDY.	3,00	6,00
T.2.- MATHEMATICAL AND PHYSICAL BASIS FOR HUMAN ANALYSIS.	4,00	8,00
T.3.- HUMAN MOVEMENT: BASIS OF THE MECHANICS.	13,00	26,00
T.4.- AIR AND AQUATIC ENVIRONMENT.	4,00	8,00
T.5.- MOVEMENT ENERGY: WORK, POWER AND ENERGY.	4,00	8,00
T.6.- MECHANICAL CHARACTERISTICS OF MATERIALS.	2,00	4,00



References

BASIC BIBLIOGRAPHY:

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COMPLEMENTARY BIBLIOGRAPHY:

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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:

☒

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: