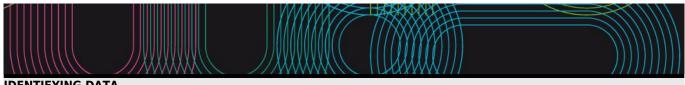
Universida_{de}Vigo

Subject Guide 2022 / 2023



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IDENTIFYING DATA					
(*)Análisis	biomecánico de actividades (e funcións humanas			
Subject	(*)Análisis				
	biomecánico de				
	actividades e				
	funcións humanas				
Code	V04M192V01105				
Study	Máster				
programme	Universitario en				
	Ingeniería				
	Biomédica				
Descriptors	ECTS Credits		Choose	Year	Quadmester
	4.5		Mandatory	1st	1st
Teaching			,		
language					
Department		'			
Coordinator	López Campos, José Ángel				
Lecturers	López Campos, José Ángel				
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Web					

Skills

General description

Code

- A5 Students must possess the learning skills that enable them to continue studying in a way that will be largely selfdirected or autonomous.
- B3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
- C5 Ability to develop biomechanical models of the musculoskeletal system based on the anthropometry of the human body and the mechanical laws of motion.

Learning outcomes	
Expected results from this subject	Training and Learning Results
To know the principles of biomechanical analysis of human activities and functions	B3 C5
To apply knowledge of the principles of biomechanical analysis of human activities and functions in the design within the field of biomedical engineering	A5 B3 C5

Topic			
1 Technical features related to the analysis of muscular activation using EMG.	1.1 Obtaining of raw signal. Protocols for data adcquisition.		
j	1.2 Signal processing. Filters, smoothing and normalisation.		
	1.3 Implementation of signal processing tools.		
2 Motion capture using optical devices.	2.1 Motion capture systems using cameras and markers.		
	2.2 Calibration of optical systems.		
	2.3 Capture, treatment and data export.		

- 3.- Computational simulation of biomechanic systems.
- 3.1. Multi-body models for the simulation of biomechanic systems.
- 3.2. Scaling and inverse kinematics.
- 3.3. Dynamic of biomechanic systems, muscular control and reverse dynamics. Systems for motion assistant.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	15	0	15
Practicum, External practices and clinical practices	21	0	21
Autonomous problem solving	0	50	50
Mentored work	0	26.5	26.5
Systematic observation	0	0	0
Project	0	26.5	26.5
Report of practices, practicum and external practice	es 0	0	0

^{*}The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
	Description
Lecturing	Sessions in which the professor exposes the new theoretical concepts to the students, accompanied of brief practical examples.
Practicum, External practices and clinical practices	Sessions in which, the theoretical concepts developed during the lectures are carried to the practice by the student with the support of the educational. Furthermore, the student will receive training about the tools and methods applied in the resolution of practical problems.
Autonomous problem solving	Taking as starting point the concepts that were depelored during lectures and the practical sessions, a set of problems are posed so that the student can apply the tools and skills adequired in the resolution of problems.
Mentored work	Extensive study in which the student will apply all the tools developed in the matter to carry out a study with a wide scope to the whole of the topics that were covered by the subject.

Personalized assistance Methodologies Description				
Tests	Description			
Project	Personalised sessions will be available for the student, they will be oriented to give guidelines to the student for performing the work and in order to remember and apply theoretical concepts in the project developed.			

Assessment					
	Description	Qualification	ı Tı	rainin	g and
			Lea	rning	Results
Systematic observation	The attitude of the student in the theoretical and practical lessons will be evaluated. Evaluation is performed by regarding participation, assistance and autonomous work.	20	A5	В3	
Project	The project delivered by the student will be evaluated.	50	A5	В3	C5
Report of practices, practicum and external practices	Continuous evaluation will be performed based on the ability of resolution of problems proposed during the practice lessons.	30	A5	В3	C5

Other comments on the Evaluation

Sources of information

Basic Bibliography

Biomechanics of the musculo-skeletal system, 0471978183, 2º, John Wiley and Sons, 1999

Complementary Bibliography

H. Moore, MATLAB for Engineers, 0133485978, 4º, Financial Times Prentice Hall, 2014

Recommendations