Teaching Guide				
Identifying Data				2021/22
Subject (*)	Biomechanical engineering, sensoring and telemedicine		Code	614522014
Study programme	Mestrado Universitario en Bioinformática para Ciencias da Saúde			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	Second	Optional	3
Language	SpanishEnglish			
Teaching method	Hybrid			
Prerequisites				
Department	Enxeñaría Naval e IndustrialFisioterapia, Medicina e Ciencias Biomédicas			
Coordinador	Pereira Loureiro, Javier	E-mail	javier.pereira@udc.es	
Lecturers	Cudeiro Mazaira, F.Javier Lugris Armesto, Urbano Pereira Loureiro, Javier Rivadulla Fernandez, Juan Casto	E-mail	javier.cudeiro@udc.es urbano.lugris@udc.es javier.pereira@udc.es casto.rivadulla@udc.es	
Web	campusvirtual.udc.gal			
General description	This subject is structured in three blocks. In the first block the student goes to know basic appearances of the bioingeneiría with examples in the development of órtesis hybrid. In the second block will analyse the current situation of the telemedicina, the participatory medicine and the wearables devices in the current lines of research. In the last block the student will know the last advances and applications of systems of brain sensorización			
Contingency plan	1. Modifications in the contents The sensorization practice at the INIBIC laboratory will be replaced by a work to be determined by the teacher. 2. Methodologies *Teaching methodologies to be maintained All except the master session *Teaching methodologies to be modified The lecture session will be done through Teams. 3. Mechanisms for personalized attention to students. 4. Modifications in the evaluation No changes. The assignments will be delivered through Moodle or oral exposition. In case of health alarm situation, the exposition will be telemati			

Study programme competences	
Code	Study programme competences
A3	CE3 ? To analyze, design, develop, implement, verify and document efficient software solutions based on an adequate knowledge of the theories, models and techniques in the field of Bioinformatics
A6	CE6 - Ability to identify software tools and most relevant bioinformatics data sources, and acquire skill in their use
A7	CE7 - Ability to identify the applicability of the use of bioinformatics tools to clinical areas.
B1	CB6 - Own and understand knowledge that can provide a base or opportunity to be original in the development and/or application of ideas, often in a context of research
B2	CB7 - Students should know how to apply the acquired knowledge and ability to problem solving in new environments or little known within broad (or multidisciplinary) contexts related to their field of study
B5	CB10 - Students should possess learning skills that allow them to continue studying in a way that will largely be self-directed or autonomous.

B6	CG1 -Search for and select the useful information needed to solve complex problems, driving fluently bibliographical sources for the field
B7	CG2 - Maintain and extend well-founded theoretical approaches to enable the introduction and exploitation of new and advanced technologies
B8	CG3 - Be able to work in a team, especially of interdisciplinary nature
C1	CT1 - Express oneself correctly, both orally writing, in the official languages of the autonomous community
C2	CT2 - Dominate the expression and understanding of oral and written form of a foreign language
C3	CT3 - Use the basic tools of the information technology and communications (ICT) necessary for the exercise of their profession and lifelong learning
C6	CT6 - To assess critically the knowledge, technology and information available to solve the problems they face to.
C8	CT8 - Rating the importance that has the research, innovation and technological development in the socio-economic and cultural progress of society

Learning outcomes			
Learning outcomes	Study programme competences		
To know basic aspects of bioengineering and fields of action.	AJ3 AJ6 AJ7	BJ7	
To know the current biometric systems, standard protocols and communications with this type of non-invasive devices in the field of health.	AJ3 AJ6 AJ7	BJ8	CJ1
To know how to select the appropriate type of sensor for each type of research project in the field of health sciences.	AJ3 AJ6 AJ7	BJ8	CJ1
To know how to acquire, analyze and interpret data from non-invasive sensors.	AJ7	BJ1 BJ2 BJ5 BJ6 BJ7 BJ8	CJ8
To know the basics of telemedicine and examples of performance.	AJ7	BJ1 BJ2 BJ5 BJ6	CJ8
To know how to identify the technological requirements for the deployment of telemedicine projects.	AJ3 AJ6 AJ7		CJ2 CJ3 CJ6 CJ8

Contents	
Topic	Sub-topic
Biomechanical engineering	Introduction to the biomechanics. Foundations and fields of work
Sensorization	The participatory health. The monitoring in the field of the biomedicine
Telemedicina	Applications of the sensors no invasivos in projects of health. Telemonitorization. Teleradiology. Example of access to PACS

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours

Supervised projects	A3 A6 A7 B1 B2 B5 B6 B7 B8 C1 C2 C3 C6 C8	5	18	23
ICT practicals	A3 A6 A7 B1 B2 B5 B6 B7 B8 C1 C2 C3 C6 C8	6	24	30
Laboratory practice	A7 B1 B8 C8	3	0	3
Guest lecture / keynote speech	A3 A6 A7 B1 B2 C3 C6 C8	7	7	14
Personalized attention		5	0	5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Supervised projects	Will carry out diverse practical works to put in practice the theoretical contents exposed in the face-to-face classes.
ICT practicals	Practices to realise during the classes
Laboratory practice	Visit to a experimental animal laboratory
Guest lecture / keynote speech	Classes of theory that base the practices of the subject

Personalized attention	
Methodologies	**Description**
Supervised projects	The works done in group will require of personalized follow-up before his public exhibition

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Supervised projects	A3 A6 A7 B1 B2 B5 B6 B7 B8 C1 C2 C3 C6 C8	Works done by groups for the application of the theoretical contents	90
Laboratory practice	A7 B1 B8 C8	Attendance and submision of the notebook data collection	10

Assessment comments
In order to pass the subject it is essential to pass both the assignments and the laboratory practices with a minimum grade of 50% in each assignment. The grading system will be expressed by numerical grade according to the established in art. 5 of the Royal Decree 1125/2003 of September 5 (BOE September 18), which establishes the European credit system and the grading system in university degrees of official character and valid throughout the national territory Grading system: 0-4.9=Failure 5-6.9=Passed 7-8.9=Good 9-10=Outstanding 9-10 Honors. If the student does not pass the course at the first opportunity, the same work must be handed in at the second opportunity, contacting the professor beforehand to evaluate the particular situation. The teacher responsible for the subject will apply the corresponding regulations of the UDC when detecting any attempt of plagiarism motivated by a student of the subject in the development of his/her work. The fraudulent performance of the tests or evaluation activities will directly imply the grade of failure '0' in the subject in the corresponding call, thus invalidating any grade obtained in all evaluation activities in the extraordinary call.

Sources of information

Basic	- Lazakidou, Athina A. et al (2009). Handbook of research on distributed medical informatics and e-health . Hershey, PA : Medical Information Science Reference - Society of Participatory Medicine (2017). Society of Participatory Medicine. Web: https://participatorymedicine.org/ - NEMA: National Electrical Manufacturers Association (2017). DICOM. Digital Imaging and Communications in Medicine. Web: http://dicom.nema.org/ - deBronkart, Dave (2011). Libro Blanco de los e-Pacientes en Español. Disponible en: https://participatorymedicine.org/epatients/2011/11/wp-espanol.html - Fawcett Tom (2015). Mining the Quantified Self: Personal Knowledge Discovery as a Challenge for Data Science . Big Data. January 2016, 3(4): 249-266 - Project-redcap.org. (). Redcap (Research Electronic Data Capture). Vanderbilt University
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.