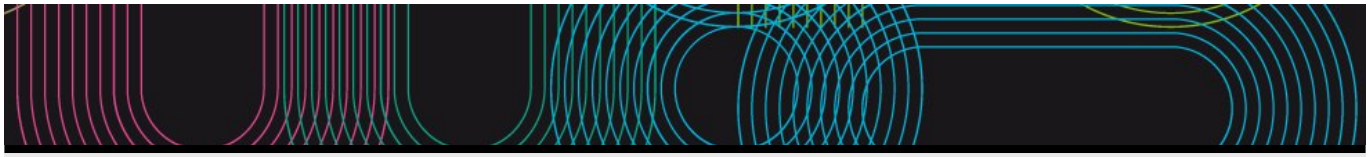

IDENTIFYING DATA				
Information systems in biomedical environments				
Subject	Information systems in biomedical environments			
Code	V12G420V01917			
Study programme	Grado en Ingeniería Biomédica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language				
Department				
Coordinator	Rodríguez Diéguez, Amador			
Lecturers	Rodríguez Diéguez, Amador			
E-mail	amador@uvigo.es			
Web				
General description	(*)Esta materia aborda o tratamento da información desde o seu deseño e almacenamento en bases de datos, até a súa análise para a obtención de información. Prestarase especial atención aos usos e estándares específicos das contornas biomédicas.			

Skills	
Code	
A5	That students have developed those learning skills needed to undertake further studies with a high degree of autonomy.
B1	CG4 Ability to solve problems with initiative and to visualize, communicate and transmit knowledge, skills and abilities in the field of biomedical engineering.
C3	CE3 Basic knowledge on the use and programming of computers, operating systems, databases and software applications in engineering.
C35	CE35 Carry out measurements and interpret data from living systems.
D5	CT5 Information Management.
D6	CT6 Application of computer science in the field of study.

Learning outcomes				
Expected results from this subject			Training and Learning Results	
New			C3	D5 D6
New		B1	C3	D5
New	A5		C3	D5 D6
New			C3 C35	D5
New	A5	B1	C3 C35	D5 D6

Contents	
Topic	
1.- INFORMATION SYSTEMS	1.1.- Basic concepts 1.2.- DataBase Management System 1.3.- Design of relational databases 1.4.- Creation of the database 1.5.- Management of the information with SQL 1.6.- Exchange of information

2.- DATA ANALYSIS	2.1.- Data preparation 2.2.- Python for data preparation 2.2.- Machine learning 2.3.- Scipy 2.4.- Scikit-learn 2.5.- Deep Learning 2.6.- Big Data
3.- BIOMEDICAL INFORMATION	3.1.- Introduction to biomedical information 3.2.- Hospital information system (HIS) 3.3.- Standards for exchange of medical information 3.4.- Traceability of biomedical information

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	22	22	44
Problem solving	10	15	25
Autonomous problem solving	0	40	40
Laboratory practical	18	20	38
Essay questions exam	3	0	3

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

Methodologies

	Description
Lecturing	Presentation of contents by the instructor
Problem solving	The instructor will solve problems in order to suplement and reinforce the concepts introduced in the theory presentations.
Autonomous problem solving	The student will solve problems on his own in order to reinforce the concepts learnt both in the classroom and in the laboratory. It will also help him identify the concepts that still needs extra work to be able to reach the minimum level.
Laboratory practical	Activities to apply the adquired knowledge to more concrete an realistic situations. It will follow an integrative approach.

Personalized assistance

Methodologies	Description
Lecturing	The instructor will solve any douts and questions in person. This assistance will take place during the lectures, the problem sessions and the lab sessions. Office hours are also available by setting an appointment in advance. Multiple digital means of communication can be used to get assistance: email, video-conference, forums, etc.
Problem solving	The instructor will solve any douts and questions in person. This assistance will take place during the lectures, the problem sessions and the lab sessions. Office hours are also available by setting an appointment in advance. Multiple digital means of communication can be used to get assistance: email, video-conference, forums, etc.
Autonomous problem solving	The instructor will solve any douts and questions in person. This assistance will take place during the lectures, the problem sessions and the lab sessions. Office hours are also available by setting an appointment in advance. Multiple digital means of communication can be used to get assistance: email, video-conference, forums, etc.
Laboratory practical	The instructor will solve any douts and questions in person. This assistance will take place during the lectures, the problem sessions and the lab sessions. Office hours are also available by setting an appointment in advance. Multiple digital means of communication can be used to get assistance: email, video-conference, forums, etc.

Assessment

	Description	Qualification	Training and Learning Results
Essay questions exam	Final examination of contents of the matter, that will be able to include problems, exercises and theoretical questions, so much in format test as of development. The punctuation of the examination will be of 0 to 10 points.	100	

Other comments on the Evaluation

There will be three tests during the teaching period. In the final exam, the student can sikip the passed parts.

The final exam will allow students to obtain 100% of the grade. The exam may be divided into sections and minimuns can

be required.

Ethical commitment: Students are expected to behave ethically. If unethical behaviour is detected (cheating, copying, plagiarism, use of unauthorized electronic devices and others), then it will be considered that the student does not meet the minimum requirements to pass the course. In this case, the final grade for the current academic year will be failed (0.0).

Sources of information

Basic Bibliography

Complementary Bibliography

Aurélien Géron, **Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow**, 2, O'Reilly, 2019

Daniel Burrueco, **https://interactivechaos.com**,

Carme Martín Escofet, **http://openaccess.uoc.edu/webapps/o2/bitstream/10609/69205/3/Bases%20de%20datos_M%C3%B3dulo%203_El%20lenguaje%20SQL.pdf**, Universitat Oberta de Catalunya, 2013

https://digitalguardian.com/blog/what-health-information-system, Digital Guardian,

https://www.caduceus.es/estandares-interoperabilidad-salud/, Caduceus Software SL,

https://www.dcvmn.org/IMG/pdf/traceability_in_healthcare.pdf, Developing Countries Vaccine Manufacturers Network,

Recommendations

Subjects that it is recommended to have taken before

Computer Science: computer science for engineering/V12G420V01203