		Teaching	Guide			
	Identifyii	ng Data			2022/23	
Subject (*)	Robotics			Code	770G01056	
Study programme	Grao en Enxeñaría Electrónica Industrial e Automática					
		Descrip	tors			
Cycle	Period	Year	r	Туре	Credits	
Graduate	2nd four-month period	Fourt	h	Optional	4.5	
Language	Spanish					
Teaching method	Face-to-face					
Prerequisites						
Department	Enxeñaría Industrial					
Coordinador	Casteleiro Roca, José Luis E-mail jose.luis.casteleiro@udc.es					
Lecturers	Casteleiro Roca, José Luis E-mail jose.luis.casteleiro@udc.es			eiro@udc.es		
	Meizoso López, Maria del Carmen carmen.meizoso@udc.es			o@udc.es		
Web						
General description	The following aspects related to robotics will be analyzed:					
	- Introduction to robotics and its integration with other 4.0 or emerging technologies					
	- Architecture and main elements of robots					
	- Mobile and/or intelligent autonomous systems					

	Study programme competences
Code	Study programme competences
А3	Capacidade para realizar medicións, cálculos, valoracións, taxacións, peritaxes, estudos e informes.
A30	Coñecer e ser capaz de modelar e simular sistemas.
A32	Coñecer os principios e aplicacións dos sistemas robotizados.
A33	Coñecemento aplicado de informática industrial e comunicacións.
B1	Capacidade de resolver problemas con iniciativa, toma de decisións, creatividade e razoamento crítico.
B2	Capacidade de comunicar e transmitir coñecementos, habilidades e destrezas no campo da enxeñaría industrial.
В3	Capacidade de traballar nun contorno multilingüe e multidisciplinar.
В4	Capacidade de traballar e aprender de forma autónoma e con iniciativa.
B5	Capacidade para empregar as técnicas, habilidades e ferramentas da enxeñaría necesarias para a práctica desta.
B6	Capacidade de usar adecuadamente os recursos de información e aplicar as tecnoloxías da información e as comunicacións na enxeñaría.
B7	Capacidade para traballar de forma colaborativa e de motivar un grupo de traballo.
B12	CB5 - Que los estudiantes hayan desarrollado aquellas habilidades de aprendizaje necesarias para emprender estudios posteriores co
	un alto grado de autonomía.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión
	para a aprendizaxe ao longo da súa vida.
C5	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.

Learning outcomes			
Learning outcomes	Study programme		ımme
	cor	npeten	ces
Understand the importance of robotics in the field of current and emerging industry	A32	B1	C1
	A33	B2	C2
		B5	C5
		В6	
		B12	

Understand the operating principles of robotics	А3	B4	
	A30	В7	
	A32		
Ability to use simulation tools and robot programming in a flexible and collaborative industrial environment	A30	В3	
	A32	В6	
	A33	В7	
Know and manage intelligent autonomous systems	A30	В6	
	A32	В7	
	A33		

Contents		
Topic	Sub-topic	
Introduction to robotics and integration with other 4.0 or	Robotics as an enabling technology in Industry 4.0	
emerging technologies	Collaborative robotics or cobots	
	Trends in industrial robotics	
Architecture and elements of robotics	Morphology	
	Model and kinematic control	
	Modeling and dynamic control	
	Programming	
Mobile and/or intelligent autonomous systems	Autonomous mobile robots (AMR)	

	Planning			
Methodologies / tests	Competencies	Ordinary class	Student?s personal	Total hours
		hours	work hours	
Guest lecture / keynote speech	A32 B1 B2 B12 C1	12	12	24
	C5			
Problem solving	A3 A30 A33 B3 B4 B5	8.5	17	25.5
	B6 B7 C2			
Laboratory practice	A30 A32 A33 B3 B4	11	32	43
	B7 B12 C1 C2 C5			
Objective test	A30 A32 B2 B4 B6	3	15	18
	B12 C1 C2 C5			
Personalized attention		2	0	2
(*)The information in the planning table is for	r guidance only and does not to	ake into account the	heterogeneity of the stud	lents.

	Methodologies
Methodologies	Description
Guest lecture /	Keynote speech complemented with the use of audiovisual media and the introduction of some questions to students, in order
keynote speech	to transmit knowledge and facilitate learning.
	The order of the topics covered will not have to be the one described in the teaching guide. In addition, there will be topics that
	can be seen together on the development of others, and the division between them may not be strict.
Problem solving	Solving exercises and specific problems in the classroom, from the knowledge explained.
Laboratory practice	Performing laboratory practice as far as possible; or, failing that, solving exercises and specific problems in the classroom,
	from the knowledge explained.
Objective test	It consists in carrying out an objective test of approximately 2 hours, in which the acquired knowledge will be evaluated.

Personalized attention			
Methodologies	Methodologies Description		
Laboratory practice	The student has the relevant meetings of personalized tutorials, to resolve the concerns arising from the matter.		
Problem solving			

	Assessment			
Methodologies	Competencies	Description	Qualification	
Laboratory practice	A30 A32 A33 B3 B4	Some tasks established in the subject, within the framework of this methodology	30	
	B7 B12 C1 C2 C5			
Objective test	A30 A32 B2 B4 B6	Exam type objective test	50	
	B12 C1 C2 C5			
Problem solving	A3 A30 A33 B3 B4 B5	Realization of works, exercises and problems	20	
	B6 B7 C2			

Assessment comments

As part of the "Laboratory practice" may include aspects such as attendance, attitude, etc., to help obtain the approved. In addition, it may also include in this methodology the assessment of the presentation in class of personal work.

The "Mixed Test" can be divided into a multiple choice part and a few questions.

It will be necessary to exceed 35% of the score in the multiple choice of the "Mixed Test" to pass.

For the second opportunity, there will be no second deadline for assignments, and the evaluation of "Laboratory practice" will be included in "Mixed test".

The evaluation criteria of the early December call will be the same as those of the second opportunity of the previous year.

Students with recognition of part-time dedication and academic waiver of attendance exemption, second establishes the "NORMA QUE REGULA O RÉXIME DE DEDICACIÓN AO ESTUDO DOS ESTUDANTES DE GRAO NA UDC (Arts. 2.3; 3.b e 4.5) (29/5/212)", will be evaluated in the same way, allowing one more week of margin in the assignments.

	Sources of information
Basic	- Barrientos y otros (2007). Fundamentos de robótica. Mc Graw-Hill
	- Ollero Baturone (2001). Manipuladores y Robots móviles. Marcombo
	- Gerald Cook (2011). Mobile Robots, Navigation, Control and Remote Senssing. IEEE Pres Editorial
	- Nikolaus Correll (2020). Introduction to Autonomous Robots. Magellan Scienti c
Complementary	

	- Ollero Baturone (2001). Manipuladores y Robots móviles. Marcombo	
	- Gerald Cook (2011). Mobile Robots, Navigation, Control and Remote Senssing. IEEE Pres Editorial	
	- Nikolaus Correll (2020). Introduction to Autonomous Robots. Magellan Scienti c	
Complementary		
Decommondations		

Recommendations

Subjects that it is recommended to have taken before

Automatic Control Systems/770G01017

Fundamentals of Electronic Circuits/770G01018

Subjects that are recommended to be taken simultaneously

Control Engineering/770G01028

Advanced Control/770G01058

Subjects that continue the syllabus

Graduation Proyect /Bachelor Thesis/770G01045

Other comments

To help achieve an immediate sustainable environment and meet the objective of action number 5: "Healthy and sustainable environmental and social teaching and research" of the "Green Campus Ferrol Action Plan":1. The delivery of the documentary works that are made in this matter: 1.1. They will be requested in virtual format and / or computer support 1.2. They will be made through Moodle, in digital format without the need to print them

(*)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.