UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: INDUSTRIAL ROBOTS
Type: CORE COURSE
Degree: 418 - UNDERGRAD. IN INDUSTRIAL ELECTRONICS AND AUTOMAT. ENGINEERING
Center: 303 - E.DE INGENIERÍA INDUSTRIAL Y AEROESPOACIAL DE TOLEDO
Year: 3
Main language: Spanish
Use of additional languages:
Web site:

Code: 56506
ECTS credits: 6
Academic year: 2023-24
Group(s): 40 50
Duration: C2
Second language:
English Friendly: Y
Bilingual: N

Lecturer: **FERNANDO JOSE CASTILLO GARCIA** - Group(s): **40 50**

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Lecturer: **SERGIO JUÁREZ PÉREZ** - Group(s): **40**

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Lecturer: **DAVID RODRIGUEZ ROSA** - Group(s): **40**

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2. Pre-Requisites

In order to take this subject to the best advantage, the student must have acquired the knowledge derived from obtaining the following skills related to the subjects of mathematics, physics, computer science, electrical technology, automatic regulation and theory of m

3. Justification in the curriculum, relation to other subjects and to the profession

The 'Industrial Robotics' subject allows students to acquire knowledge of principles and applications of robotic systems which, complemented with those acquired in other specific subjects, will facilitate the application of their skills in the world of work or research anc

4. Degree competences achieved in this course

Course competences

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CEE09	Knowledge of the principles and applications of robotic systems.
CG03	Knowledge of basic and technological subjects to facilitate learning of new methods and theories, and provide versatility to adapt to new situations.
CG04	Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of industrial engineering.
CG06	Ability to handle specifications, regulations and mandatory standards.
CT01	Knowledge of a second language.
CT02	Knowledge and application of information and communication technology.
CT03	Ability to communicate correctly in both spoken and written form.

5. Objectives or Learning Outcomes

Course learning outcomes

Description
Knowledge of the work space of a robot and its limitations.
Knowledge of applications of industrial robots.
Ability to apply the main software tools for robots.
Capacity to generate paths within the work environment.
Capacity to identify different types of robots.
Capacity to dynamically model the structure of a rigid robot.
Ability to use the main programming languages of industrial robots.

6. Units / Contents

Unit 1: Fundamentals
Unit 2: Morphology of robots
Unit 3: Mathematics tools
Unit 4: Kinematic modelling and control
Unit 5: Dynamic modelling and control
Unit 6: Industrial application and tends

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures		1.2	30	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises		0.4	10	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities		0.6	15	Y	Y	
Formative Assessment [ON-SITE]	Assessment tests		0.2	5	Y	Y	
Self-study [OFF-SITE]	Self-study		3.6	90	N	-	
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4					**Total class time hours: 60**
		Total credits of out of class work: 3.6					**Total hours of out of class work: 90**

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Final test	0.00%	70.00%	These tests will include theoretical-practical questions and/or problem-solving related to the content of a section of the subject.
Mid-term tests	70.00%	0.00%	It will include theoretical-practical questions and/or problem-solving related to the content of the subject.
Laboratory sessions	30.00%	30.00%	The evaluation will be based on the reports submitted after the completion of each practical session, as indicated by the professor of the subject. A grade equal to or higher than 4 out of 10 will be required to pass the subject.
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:
The theory mark will be the average of the marks obtained in the different mid-term tests carried out.

Non-continuous evaluation:
It will consist of two tests: 1) Theoretical test that will be worth 70% of the overal rating and will have the same format as the mid-term tests, 2) Technical reports after the practical lectures, practical test of simulation with Matlab, and/or alternative practical work, which will be worth 30% of the overal rating.

Specifications for the resit/retake exam:
The evaluation criteria in the resist/retake exam are the same as those used in the non-continuous evaluation of the final exam.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Formative Assessment [PRESENCIAL][Assessment tests]	5
Self-study [AUTÓNOMA][Self-study]	90

Global activity

Activities	hours
Formative Assessment [PRESENCIAL][Assessment tests]	5
Self-study [AUTÓNOMA][Self-study]	90
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
A. Barrientos, L.F. Peñín, C. Balaguer, R. Aracil	Fundamentos de Robótica	McGraw-Hill		84-481-0815-9	2007	
P. Corke	Robotics toolbox				2002	
	http://www.petercorke. com/Robotics% 20Toolbox. html					
B. Siciliano, K. Oussama	Handbook of Robotics	Springer		978-3-540-23957-4	2008	
J.J. Craig	Indroduction to Robotics: Mechanics and Control	Pearson		97812920400	2014	
	Operating manual RobotStudio - ABB				2007	
	https://library.e.abb.com ¿ public					