UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	INDUSTRIAL INSTRUMENTATION AND MEASUREMENT	**Code:**	56430
Type:	ELECTIVE	**ECTS credits:**	6
Degree:	354 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING (ALM)	**Academic year:**	2023-24
Center:	106 - SCHOOL OF MINING AND INDUSTRIAL ENGINEERING	**Group(s):**	55
Year:	4	**Duration:**	C2
Main language:	Spanish	**Second language:**	English
Use of additional languages:		**English Friendly:**	Y
Web site:		**Bilingual:**	N

Lecturer: **JAVIER DE LAS MORENAS DE LA FLOR** - Group(s): **55**

Building/Office	Department	Phone number	Email	Office hours
Edificio Störr, 3º planta, Dpto. IEEAC	INGENIERÍA ELÉCTRICA, ELECTRÓNICA, AUTOMÁTICA Y COMUNICACIONES	+34 926 05 22 69	javier.delasmorenas@uclm.es	To be indicated at the beginning of the semester

2. Pre-Requisites

As prerequisites to take the Industrial Instrumentation and Measurement course, students must have successfully passed the basic subjects for instrumentation, such as Electronics, Electrical Technology and Circuit Theory

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

The student acquires knowledge of data acquisition, adaptation and presentation of data. That is, it knows the different sensor technologies that exist, learns to acquire, filter and amplify the signal from these sensors and how to present it.

4. Degree competences achieved in this course

Course competences

Code	Description
A02	To know how to apply knowledge to work or vocation in a professional manner and possess the competences that are usually demonstrated by the formulation and defence of arguments and the resolution of problems in the field of study.
A05	To have developed the learning skills necessary to undertake subsequent studies with a greater degree of autonomy.
A07	Knowledge of Information Technology and Communication (ITC).
A19	Ability to work in a multilingual and multidisciplinary environment.
G04	Ability to use electromechanical transducers and electrical measuring equipment

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge and use of transducers and measuring equipment

6. Units / Contents

Unit 1: Introduction

Unit 2: Transducers

Unit 3: Temperature and pressure sensors

Unit 4: Flow and level sensors

Unit 5: Resistive sensors and signal conditioning

Unit 6: Variable reactance and electromagnetic sensors

Unit 7: Generator sensors and signal conditioning

Unit 8: Network analizers. Power and quality

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]	Combination of methods	A02 A05 A07 A19	1	25	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	A02 A07	0.6	15	N	-	
Laboratory practice or sessions							

[ON-SITE]	Practical or hands-on activities	A02 A05 A07 G04	0.6	15	Y	Y	
Self-study [OFF-SITE]	Self-study	A02 A05 A07 G04	3.6	90	N	-	
Progress test [ON-SITE]	Assessment tests	A02 A05 A07 G04	0.2	5	Y	Y	
		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
Practicum and practical activities reports assessment	20.00%	20.00%	
Theoretical papers assessment	46.00%	46.00%	1.- The student will have to make a virtual instrument in the Labview environment fulfilling the specifications and indications marked by the teacher. The student will have to study the operation of several transducers (40%). 2.- The work done by the student during the laboratory practices and the quality of the report presented will be evaluated. (26%)
Progress Tests	34.00%	34.00%	A test or tests of progress in which the theoretical knowledge studied during the course is evaluated. In case of passing these tests, the student will not have to take the exam of the ordinary convocation.
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:

In the ordinary course, the students will take a theoretical/practical test to evaluate the knowledge developed during the course.
In any case, in order to pass the course, it is compulsory to pass the laboratory practices.

Non-continuous evaluation:

Evaluation criteria not defined

Specifications for the resit/retake exam:

In the special session, students must take an exam on the entire subject matter.
In order to pass the course, it is essential to pass the laboratory practices. It is possible to retace the laboratory practice with a practice test

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	**hours**
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Progress test [PRESENCIAL][Assessment tests]	5
Unit 1 (de 8): Introduction	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3
Unit 2 (de 8): Transducers	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Self-study [AUTÓNOMA][Self-study]	10
Unit 3 (de 8): Temperature and pressure sensors	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3.25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Self-study [AUTÓNOMA][Self-study]	10
Unit 4 (de 8): Flow and level sensors	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	3.25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Self-study [AUTÓNOMA][Self-study]	10
Unit 5 (de 8): Resistive sensors and signal conditioning	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	2.25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Self-study [AUTÓNOMA][Self-study]	10
Unit 6 (de 8): Variable reactance and electromagnetic sensors	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2

Self-study [AUTÓNOMA][Self-study]	10
Unit 7 (de 8): Generator sensors and signal conditioning	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Self-study [AUTÓNOMA][Self-study]	10
Unit 8 (de 8): Network analizers. Power and quality	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	8
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.25
Self-study [AUTÓNOMA][Self-study]	30
Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Combination of methods]	27.75
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	12.25
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	15
Progress test [PRESENCIAL][Assessment tests]	5
Self-study [AUTÓNOMA][Self-study]	90
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Pallás Areny, Ramón	Sensores y acondicionadores de señal	Marcombo Boixareu		84-267-1344-0	2003	
Pérez García, Miguel	Instrumentación electrónica	Thomson		84-9732-166-9	2006	
	Programa académico de NI http://spain.ni.com/academic					
Creus Solé, Antonio	Instrumentación industrial	Marcombo		84-267-1361-0	2005	