



1. General information

Course: INDUSTRIAL INSTRUMENTATION AND MEASUREMENT**Code:** 56430**Type:** ELECTIVE**ECTS credits:** 6**Degree:** 412 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING**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

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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
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.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CEO16	Ability to use electromechanical transducers and electrical measuring equipment.
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.
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 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 analyzers. 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	CB02 CB05 CEO16 CG03 CG04 CG06 CT02 CT03	1	25	N	-
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CB02 CB05 CEO16 CG03 CG04 CG06 CT02 CT03	0.6	15	N	-
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CB02 CB05 CEO16 CG03 CG04 CG06 CT02 CT03	0.6	15	Y	Y
Self-study [OFF-SITE]	Self-study	CB02 CB05 CEO16 CG03 CG04 CG06 CT02 CT03	3.6	90	N	-
Progress test [ON-SITE]	Assessment tests	CB02 CB05 CEO16 CG03 CG04 CG06 CT02 CT03	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
Final test	0.00%	34.00%	
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%)
Mid-term tests	34.00%	0.00%	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
Class Attendance (theory) [PRESENCIAL][Combination of methods]	25
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Self-study [AUTÓNOMA][Self-study]	90
Progress test [PRESENCIAL][Assessment tests]	5
Global activity	
Activities	hours
Progress test [PRESENCIAL][Assessment tests]	5
Self-study [AUTÓNOMA][Self-study]	90
Class Attendance (theory) [PRESENCIAL][Combination of methods]	25
Class Attendance (practical) [PRESENCIAL][Practical or hands-on activities]	15
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
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 Programa académico de NI	Thomson		84-9732-166-9	2006	

