



1. General information

Course: WELDING ENGINEERING

Type: ELECTIVE

Degree: 351 - UNDERGRADUATE DEGREE PROG. IN MECHANICAL ENGINEERING (ALM)

Center: 106 - SCHOOL OF MINING AND INDUSTRIAL ENGINEERING

Year: 4

Main language: Spanish

Use of additional languages:

Web site:

Code: 56353

ECTS credits: 4.5

Academic year: 2023-24

Group(s): 56

Duration: C2

Second language: English

English Friendly: Y

Bilingual: N

Lecturer: ELENA MARIA BEAMUD GONZALEZ - Group(s): 56

Building/Office	Department	Phone number	Email	Office hours
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2. Pre-Requisites

To take this subject with the maximum use, it is recommended that the student has achieved skills related to the basic knowledge of materials engineering, production and manufacturing systems, graphic representation systems and metrology.

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

This subject seeks to deepen the knowledge of the different welding techniques and mechanical joints, as well as tests and defects for the quality control of these in the field of mechanical engineering.

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.
A03	To have the capability to gather and interpret relevant data (normally within the area of study) to make judgements that include a reflection on themes of a social, scientific or ethical nature.
A04	To be able to transmit information, ideas, problems and solutions to a specialized audience.
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).
A08	Appropriate level of oral and written communication.
A16	Ability to analyse and evaluate the social and environmental impact of technical solutions.
A17	Ability to apply principles and methods of quality control.
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
G01	Knowledge of design and calculation of installations and services in the following areas: thermal insulation, acoustic insulation, ventilation, heating, air-conditioning and combustible gases, as well as the use of basic regulations.
G02	Knowledge and ability in the calculation and design of structures using reinforced concrete.
G03	Applied knowledge of the design and calculation of hydro sanitary installations and fire prevention, as well as the use of basic regulations.
G04	Applied knowledge in the projection, design and calculation of joints, as well as the necessary skills in the use of equipment used in the field of joints
G05	Ability to design, write, use, direct and control integrated systems of use (time periods, quality, environmental, prevention, security).
G05	Ability to analyse and compare proposed alternatives in the allocation and contracting of projects. Ability to synthesize all the information in a system in a project, communicate this information and defend it to a third party.
G06	Knowledge of topography, photogrammetry and cartography. Knowledge of geo-techniques and the mechanics of soils and rocks.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Advanced knowledge of the engineering of joints

6. Units / Contents

Unit 1: Introduction to the welding process

Unit 2: Teoric and practical fundamentals of the welding process and mechanic joint

Unit 3: Quality control of welding joint and mechanic joint

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	A08 A16 A17 CB01 CB02 CB03 CB04 CB05 G01 G02 G03 G04 G05 G06	0.6	15	N		1.- Development in the classroom of the theoretical contents, using the method of the participatory master lesson. Use of brief follow-up issues and short verification activities.
Class Attendance (practical) [ON-SITE]	Combination of methods	A02 A03 A04 A05 A07 A08 A16 A17 CB01 CB02 CB03 CB04 CB05 G01 G02 G03 G04 G05 G06	0.6	15	Y	Y	Laboratory practices in the mechanical workshop to know the operation and use of welding techniques and equipment
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A03 A04 A05 A07 A08 A16 A17 CB01 CB02 CB03 CB04 CB05 G01 G02 G03 G04 G05 G06	2.7	67.5	N		- Self-Employment
Formative Assessment [ON-SITE]	Assessment tests	A02 A03 A04 A05 A07 A08 A16 A17 CB01 CB02 CB03 CB04 CB05 G01 G02 G03 G04 G05 G06	0.2	5	Y	Y	Theoretical-practical test that the student will develop and demonstrate that the knowledge of the subject has been acquired.
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	A02 A03 A04 A05 A07 A08 A16 A17 CB01 CB02 CB03 CB04 CB05 G01 G02 G03 G04 G05 G06	0.4	10	N		The student will deliver a work that integrates the applications of different types of welding seen in the subject
Total:			4.5	112.5			
Total credits of in-class work: 1.8			Total class time hours: 45				
Total credits of out of class work: 2.7			Total hours of out of class work: 67.5				

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	33.33%	33.33%	It will consist of carrying out tests with aspects of theoretical-practical application. This test must be passed at least, with a 4 out of 10.
Practicum and practical activities reports assessment	33.33%	33.33%	In continuous evaluation will consist of the delivery of a report of practices. In the non-continuous evaluation the memory will be replaced by an additional practical test on the day of the ordinary call. Minimum grade 4.
Projects	33.34%	33.34%	Realization of a work that integrates all the applications studied in the subject. Minimum grade: 4.
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 regulations for the subject of engineering of unions will be as follows: 1 ° The practices will be obligatory and will be developed during the second semester.

2 ° At the end of this semester and before the final examination, the student will have delivered sequentially, through the Moodle platform, a detailed and personalized memory of the practices carried out, indicating even the day of realization.

This report shall contain at least the following data: a) Practice number and name of the practice.

B. Schematic drawing of the practice and material used.

C. Necessary and used equipment D) Form of realization, positioning, movements, etc.

e) Photograph of the piece obtained and analysis of possible defects.

F. All data that the student creates necessary.

3 ° The final note of the subject will consist of a summation of 7 points maximum corresponding to the theoretical part and problems and three points for the practical part and delivery of a work on the seminars carried out throughout the semester. Attendance at organized seminars is absolutely compulsory in order to achieve these points.

4 ° For those students who do not deliver these reports and/or do not find all the practices during the second semester or have not attended the seminars, even those who have made the delivery, but not original works, are similar/ Copied from other companions, for all of them, it will be obligatory to pass a practical/theoretical examination in order to approve the subject.

This examination shall be carried out on the same day as the theorist, with the date, time and place on the bulletin board in the engineering area of the manufacturing process being previously indicated.

Non-continuous evaluation:

The regulations for the subject of engineering of unions will be as follows: 1 ° The practices will be obligatory and will be developed during the second semester.

2 ° At the end of this semester and before the final examination, the student will have delivered sequentially, through the Moodle platform, a detailed and personalized memory of the practices carried out, indicating even the day of realization.

This report shall contain at least the following data: a) Practice number and name of the practice.

B. Schematic drawing of the practice and material used.

C. Necessary and used equipment D) Form of realization, positioning, movements, etc.

e) Photograph of the piece obtained and analysis of possible defects.

F. All data that the student creates necessary.

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Specifications for the resit/retake exam:

5 ° in the examination corresponding to the call for extraordinary will not be taken into account the notes obtained in the first call, nor, will be taken into account, for later courses.

Specifications for the second resit / retake exam:

The same as the last part.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	15
Class Attendance (practical) [PRESENCIAL][Combination of methods]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	67.5
Formative Assessment [PRESENCIAL][Assessment tests]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Global activity	
Activities	hours
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Formative Assessment [PRESENCIAL][Assessment tests]	5
Class Attendance (theory) [PRESENCIAL][Combination of methods]	15
Class Attendance (practical) [PRESENCIAL][Combination of methods]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	67.5
Total horas: 112.5	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
D. Rodriguez Salgado	Soldadura	Bellisco	Barcelona		2002	
Houldcroft, Peter Thomas	Welding Process Tecnology	University of Cambridge			1988	
J. E. Neely	Metalurgia y Materiales Industriales	Limusa	Mexico		2002	
J. Giachino and W. Weeks	Tecnica y practica de la soldadura	Reverte	Barcelona		1997	
D. Rodriguez Salgado	Formulario Tecnico de Soldadura	Bellisco	Madrid		2006	
M. P. Groover	Fundamentos de manufactura moderna	McGraw-Hill	Mexico		2007	