UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	WELDING ENGINEERING	**Code:**	56353
Type:	ELECTIVE	**ECTS credits:**	4.5
Degree:	351 - UNDERGRADUATE DEGREE PROG. IN MECHANICAL ENGINEERING (ALM)	**Academic year:**	2020-21
Center:	106 - SCHOOL OF MINING AND INDUSTRIAL ENGINEERING	**Group(s):**	56
Year:	4	**Duration:**	C2
Main language:	Spanish	**Second language:**	English
Use of additional languages:		**English Friendly:**	Y
Web site:		**Bilingual:**	N

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

Building/Office	Department	Phone number	Email	Office hours
E'Ihuyar 2.06	MECÁNICA ADA. E ING. PROYECTOS	926295300 Ext. 6043	elenamaria.beamud@uclm.es	

2. Pre-Requisites

In order to the students reach objectives described above, it is highly recommended to have exceeded the subjects of the preceding courses related to the contents of this module (elasticity and strengh of materials, Structures engineering, Thermal engineering, Fluid mechanics, Graphic design and engineering projects.

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

The Industrial Engineer is the professional who uses the knowledge of the physical sciences and mathematics and the engineering techniques to develop his professional activity in aspects such as control, instrumentation and automation of processes and equipment, as well as the design, construction, operation and maintenance of industrial products. This training allows you to participate successfully in the different branches to integrate industrial engineering, such as mechanics, electricity, electronics, etc., adapt to the changes in the technologies in these areas and, if necessary, generate them, responding to the need presented in the productive and service branches to achieve the welfare of the society to which it is owed.

The course of joints engineering aims that the students acquire practical knowledge in the field of the joints and expand the knowledge acquired in the specific subject of manufacturing technology in joints. These tools allow to manage easily in projects that encompass the joint field, providing them with a deep training that currently is highly valued by companies.

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.
A13	Ability to take the initiative to solve problems, take decisions, creativity, critical reasoning and ability to communicate and transmit knowledge, skills and abilities in Mechanical Engineering.
A14	Knowledge to undertake measurements, calculations, evaluations, appraisals, studies, give expert opinions, reports, work plans and similar tasks.
A15	Ability to work to specifications and comply with obligatory rules and regulations.
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
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

5. Objectives or Learning Outcomes

Course learning outcomes

Description
Advanced knowledge of the engineering of joints

6. Units / Contents

Unit 1: MODULE I: GENERALITIES
- **Unit 1.1** WELDING GENERALITIES

Unit 2: MODULE II: WELDING PROCESS
- **Unit 2.1** HETEREOGENEUS WELDING
- **Unit 2.2** COMBUSTION WELDING
- **Unit 2.3** ELECTRICAL ARC WELDING
- **Unit 2.4** SOLDABILITY
- **Unit 2.5** WELDING TECNIQUES. OPERATIVE METHODS.
- **Unit 2.6** DEFORMATIONS AND FORCES MADE BY HEAT
- **Unit 2.7** DEFECTS IN THE WELDING
- **Unit 2.8** ESSAYS
- **Unit 2.9** RESISTANCE WELDING
- **Unit 2.10** PRESSURE WELDING
- **Unit 2.11** SYMBOL OF WELDING JOINTS

Unit 3: MODULO III: OTHER PROCESS OF JOINTS
- **Unit 3.1** ENSAMBLED, FIXED JOINTS

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	A02 A15 G04	0.68	17	N	-	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	A02 A03 A08 A13 A15 G04	0.23	5.75	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	A02 A03 A08 A13 A15 G04	2.7	67.5	N	-	
Final test [ON-SITE]	Assessment tests	A02 A03 A04 A07 A08 A13 A14 A15 A16 A17 G04	0.15	3.75	Y	Y	
Individual tutoring sessions [ON-SITE]	Combination of methods	A02 A03 A08 A13 A15 G04	0.44	11	N	-	
Problem solving and/or case studies [ON-SITE]	Combination of methods	A02 A08 A13 A14 A15 A16 A17 CB01 CB02 CB03 CB04 CB05	0.3	7.5	N	-	
		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%	Final Test
Practicum and practical activities reports assessment	66.67%	66.67%	Work and practices related to the lessons
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 º The practices will be obligatory and will be developed during the second semester.

2 º 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 º 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 º 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:

Evaluation criteria not defined

Specifications for the resit/retake exam:

5 º 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**
Final test [PRESENCIAL][Assessment tests]	.75
Unit 1 (de 3): MODULE I: GENERALITIES	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
Individual tutoring sessions [PRESENCIAL][Combination of methods]	2
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	1.5
Unit 2 (de 3): MODULE II: WELDING PROCESS	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	12
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	55
Individual tutoring sessions [PRESENCIAL][Combination of methods]	8
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	5
Unit 3 (de 3): MODULO III: OTHER PROCESS OF JOINTS	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	.75
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Final test [PRESENCIAL][Assessment tests]	3
Individual tutoring sessions [PRESENCIAL][Combination of methods]	1
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	1
Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	17
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	5.75
Study and Exam Preparation [AUTÓNOMA][Self-study]	67.5
Individual tutoring sessions [PRESENCIAL][Combination of methods]	11
Final test [PRESENCIAL][Assessment tests]	3.75
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	7.5
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 Industiales	Limusa	Mexico		2002	
J. Giachino and W. Weeks	Tecnica y practica de la soldatura	Reverte	Barcelona		1997	
D. Rodriguez Salgado	Formulario Tecnico de Soldudura	Bellisco	Madrid		2006	
M. P. Groover	Fundamentos de manufactura moderna	McGraw-Hill	Mexico		2007	