UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	METALLIC MATERIALS IN MECHANICAL ENGINEERING	**Code:**	56332
Type:	ELECTIVE	**ECTS credits:**	6
Degree:	352 - UNDERGRADUATE DEGREE PROGRAMME IN MECHANICAL ENGINEERING (AB)	**Academic year:**	2023-24
Center:	605 - SCHOOL OF INDUSTRIAL ENGINEERS. AB	**Group(s):**	11
Year:	4	**Duration:**	C2
Main language:	Spanish	**Second language:**	
Use of additional languages:		**English Friendly:**	Y
Web site:		**Bilingual:**	N

Lecturer: **JUAN CARLOS PEREZ FLORES** - Group(s): **11**

Building/Office	Department	Phone number	Email	Office hours
Instituto Energías Renovables / 0D1	MECÁNICA ADA. E ING. PROYECTOS	926053325	JuanCarlos.PFlores@uclm.es	

2. Pre-Requisites

Not established

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

Not established

4. Degree competences achieved in this course

Course competences

Code	Description
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.
A05	To have developed the learning skills necessary to undertake subsequent studies with a greater degree of autonomy.
A10	Ability to produce and develop projects in the field of industrial engineering and automation aimed at, and in accordance with the knowledge acquired as established in section 5 of Order CIN/351/2009, the construction, remodelling, repair, conservation, demolition, manufacturing, installation, assembly or use of: structures, mechanical equipment, power installations, electrical and electronic installations, industrial plants and installations and processes of manufacture and automatization.
A12	Knowledge of basic materials and technologies that assist the learning of new methods and theories and enable versatility to adapt to new situations.
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.
A17	Ability to apply principles and methods of quality control.
F1	Know the thermomechanical treatment of metallic materials and know how to predict the microstructural changes that will produce those treatments and their relationship with their properties.
F2	Recognize the large families of ferrous metal alloys (steel and cast iron), light alloys (aluminium, titanium), and Cu and Zn, and their typical microstructures, and know how to predict and/or interpret properties and applications.
F3	Be able to choose the most appropriate material for a particular application, taking into account the effect of the design and process of formation.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Gain skills and abilities in the materials science laboratory, mechanical trials, metrology and manufacturing

Ability to select the material to use and its treatment with the aim to obtain the required properties before and after its processing

Ability to design the processes of production based on the desired properties of the material according to the application for which it is intended

6. Units / Contents

Unit 1:

Unit 2:

Unit 3:

Unit 4:

Unit 5:

Unit 6:

Unit 7:

Unit 8:

Unit 9:
Unit 10:
Unit 11:

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	A03 A05 A10 A12 A13 A14 A15 A17 F1 F2 F3	1.2	30	Y	N	
Class Attendance (practical) [ON-SITE]	Guided or supervised work	A03 A05 A10 F1 F2 F3	0.64	16	Y	N	
Project or Topic Presentations [ON-SITE]	Group Work	A03 A05 A10 F1 F2 F3	0.16	4	Y	N	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	A03 A05 A10 A13 A15 F1 F3	0.32	8	Y	N	
Final test [ON-SITE]	Assessment tests	A03 A05 A10 A12 A13 A14 A15 A17 F1 F2 F3	0.08	2	Y	N	
Writing of reports or projects [OFF-SITE]	Cooperative / Collaborative Learning	A03 A05 A10 F1 F2 F3	0.8	20	Y	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Self-study	A03 A05 A10 A13 A15 F1 F2 F3	0.64	16	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study	A03 A05 A10 A12 A13	2.16	54	Y	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
Theoretical exam	0.00%	60.00%	
Oral presentations assessment	25.00%	0.00%	
Practicum and practical activities reports assessment	15.00%	15.00%	
Progress Tests	60.00%	0.00%	
Theoretical papers assessment	0.00%	25.00%	
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).

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	**hours**
Final test [PRESENCIAL][Assessment tests]	2

Unit 1 (de 11):

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	2

Group 11:

Initial date: 03-02-2020 **End date:** 10-02-2020

Unit 2 (de 11):

Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	4

Group 11:

Initial date: 11-02-2020 **End date:** 17-02-2020

Unit 3 (de 11):

Activities	**Hours**

Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
Group 11:	
Initial date: 18-02-2020	**End date:** 25-02-2020
Unit 4 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	1
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	6
Group 11:	
Initial date: 02-03-2020	**End date:** 09-03-2020
Unit 5 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	2
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
Group 11:	
Initial date: 10-03-2020	**End date:** 17-03-2020
Unit 6 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	1
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	2
Group 11:	
Initial date: 23-03-2020	**End date:** 24-03-2020
Unit 7 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	1
Project or Topic Presentations [PRESENCIAL][Group Work]	1
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	2
Group 11:	
Initial date: 30-03-2020	**End date:** 31-03-2020
Unit 8 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	1
Project or Topic Presentations [PRESENCIAL][Group Work]	1
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
Group 11:	
Initial date: 14-04-2020	**End date:** 20-04-2020
Unit 9 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	2
Project or Topic Presentations [PRESENCIAL][Group Work]	1
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
Group 11:	
Initial date: 21-04-2020	**End date:** 27-04-2020
Unit 10 (de 11):	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	2
Project or Topic Presentations [PRESENCIAL][Group Work]	1
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	6
Group 11:	
Initial date: 28-04-2020	**End date:** 04-05-2020
Unit 11 (de 11):	

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
Group 11:	
Initial date: 11-05-2020	**End date:** 18-05-2020

Global activity	
Activities	**hours**
Class Attendance (practical) [PRESENCIAL][Guided or supervised work]	15
Project or Topic Presentations [PRESENCIAL][Group Work]	4
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	10
Final test [PRESENCIAL][Assessment tests]	2
Writing of reports or projects [AUTÓNOMA][Cooperative / Collaborative Learning]	20
Practicum and practical activities report writing or preparation [AUTÓNOMA][Self-study]	16
Study and Exam Preparation [AUTÓNOMA][Self-study]	54
Class Attendance (theory) [PRESENCIAL][Lectures]	29
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Bhadeshia, H.K.D.H., Honeycombe, R.W.K.	Steels. Microstructure and properties	Butterworth-Heinemann			2007	
J. Apraiz Barreiro	Tratamientos térmicos de los aceros	Dossat			2002	
J.A. Pero-Sanz Elorza	Aceros: Metalurgia física, selección y diseño	Dossat 2000			2004	
J.R. Davis	Properties and selection: nonferrous alloys and special-purpose materials	ASM International			1990	
Smallman, R.E., Bishop, R.J.	Metals and Materials. Science, processes, applications	Butterworth-Heinemann			1995	
W.F. Smith and J. Hashemi	Fundamentos de la Ciencia e Ingeniería de Materiales	McGraw Hill			2014	
F. J. Belzunce	Aceros y Fundiciones: Estructura, Transformaciones, Tratamiento Térmicos y Aplicaciones	Universidad de Oviedo			2001	