



## 1. General information

Course: ENGINEERING THERMODYNAMICS

Type: CORE COURSE

Degree: 357 - UNDERGRADUATE DEGREE PROGRAMME IN ELECTRICAL ENGINEERING (TO)

Center: 303 - E.DE INGENIERÍA INDUSTRIAL Y AEROESPACIAL DE TOLEDO

Year: 2

Main language: Spanish

Use of additional languages:

Web site:

Code: 56321

ECTS credits: 6

Academic year: 2023-24

Group(s): 40

Duration: C2

Second language: English

English Friendly: Y

Bilingual: N

Lecturer: OCTAVIO ARMAS VERGEL - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/1.57	MECÁNICA ADA. E ING. PROYECTOS	926295462	octavio.armas@uclm.es	

Lecturer: MARIA REYES GARCIA CONTRERAS - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/1.57	MECÁNICA ADA. E ING. PROYECTOS	926052624	mariareyes.garcia@uclm.es	

Lecturer: MARIA ARANTZAZU GOMEZ ESTEBAN - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/1.57	MECÁNICA ADA. E ING. PROYECTOS	926051405	aranzazu.gomez@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
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 both a specialist and non-specialist audience.
A05	To have developed the learning skills necessary to undertake subsequent studies with a greater degree of autonomy.
A08	Appropriate level of oral and written communication.
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 Electrical Engineering.
A14	Knowledge to undertake measurements, calculations, evaluations, appraisals, studies, give expert opinions, reports, work plans and similar tasks.
C01	Knowledge of applied thermodynamics and heat transmission. Basic principles and their application in the resolution of engineering problems.

## 5. Objectives or Learning Outcomes

## Course learning outcomes

Description

## Additional outcomes

## 6. Units / Contents

## Unit 1:

Unit 1.1

Unit 1.2

Unit 1.3

Unit 1.4

Unit 1.5

Unit 1.6

Unit 1.7

Unit 1.8  
 Unit 1.9  
 Unit 1.10  
 Unit 1.11  
 Unit 2:  
 Unit 2.1  
 Unit 2.2  
 Unit 3:  
 Unit 3.1  
 Unit 3.2  
 Unit 3.3  
 Unit 4:  
 Unit 4.1  
 Unit 4.2  
 Unit 4.3  
 Unit 4.4  
 Unit 4.5  
 Unit 5:  
 Unit 5.1  
 Unit 6:  
 Unit 6.1  
 Unit 6.2  
 Unit 6.3  
 Unit 6.4  
 Unit 6.5  
 Unit 6.6  
 Unit 6.7  
 Unit 7:  
 Unit 7.1  
 Unit 7.2  
 Unit 7.3  
 Unit 7.4  
 Unit 8:  
 Unit 8.1  
 Unit 8.2  
 Unit 8.3  
 Unit 8.4  
 Unit 8.5  
 Unit 8.6

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Other on-site activities [ON-SITE]	Lectures		0.02	0.5	N	-	
Class Attendance (theory) [ON-SITE]	Lectures		1.2	30	N	-	
Class Attendance (practical) [ON-SITE]	Problem solving and exercises		0.76	19	N	-	
Laboratory practice or sessions [ON-SITE]	Cooperative / Collaborative Learning		0.16	4	Y	Y	
Computer room practice [ON-SITE]	Cooperative / Collaborative Learning		0.08	2	Y	Y	
Progress test [ON-SITE]	Assessment tests		0.06	1.5	Y	N	
Final test [ON-SITE]	Assessment tests		0.12	3	Y	Y	
On-line Activities [OFF-SITE]	Assessment tests		0.02	0.5	Y	N	
Practicum and practical activities report writing or preparation [OFF-SITE]	Group Work		0.36	9	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study		3.22	80.5	N	-	
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>				<b>Total class time hours: 60</b>			
<b>Total credits of out of class work: 3.6</b>				<b>Total hours of out of class work: 90</b>			

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

Laboratory sessions	0.00%	0.00%	
Practicum and practical activities reports assessment	0.00%	0.00%	
Progress Tests	0.00%	0.00%	
Assessment of active participation	0.00%	0.00%	
Test	0.00%	0.00%	
Final test	0.00%	100.00%	
<b>Total:</b>	<b>0.00%</b>	<b>100.00%</b>	

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	
<b>Hours</b>	<b>hours</b>
Other on-site activities [PRESENCIAL][Lectures]	.5
Progress test [PRESENCIAL][Assessment tests]	1.5
Final test [PRESENCIAL][Assessment tests]	3
On-line Activities [AUTÓNOMA][Assessment tests]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	8.5
<b>Unit 1 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	9
<b>Unit 2 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	6.75
<b>Unit 3 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3
Laboratory practice or sessions [PRESENCIAL][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	9
<b>Unit 4 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3
Computer room practice [PRESENCIAL][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
<b>Unit 5 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	.75
<b>Unit 6 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3.5
Laboratory practice or sessions [PRESENCIAL][Cooperative / Collaborative Learning]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	12.75
<b>Unit 7 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	12.75
<b>Unit 8 (de 8):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	10.5
<b>Global activity</b>	
<b>Activities</b>	<b>hours</b>
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Class Attendance (practical) [PRESENCIAL][Problem solving and exercises]	19
Laboratory practice or sessions [PRESENCIAL][Cooperative / Collaborative Learning]	4

Computer room practice [PRESENCIAL][Cooperative / Collaborative Learning]	2
Progress test [PRESENCIAL][Assessment tests]	1.5
Final test [PRESENCIAL][Assessment tests]	3
On-line Activities [AUTÓNOMA][Assessment tests]	0.5
Practicum and practical activities report writing or preparation [AUTÓNOMA][Group Work]	9
Study and Exam Preparation [AUTÓNOMA][Self-study]	80.5
Other on-site activities [PRESENCIAL][Lectures]	0.5
<b>Total horas: 150</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Hernández, J.J.; Rodríguez, J.; Sanz, J.	Transmisión de calor para ingenieros	Universidad de Castilla-La Mancha		978-84-8427-737-8	2010	Bibliografía básica para el Bloque II: Transmisión de calor
Incropera, Frank P.	Fundamentos de transferencia de calor	Prentice hall		970-17-0170-4	1999	Bibliografía básica para el Bloque II: Transmisión de calor
Lapuerta, M.; Hernández, J.J.; Ballesteros. R.	Termodinámica	Universidad de Castilla-La Mancha			2009	Bibliografía básica para el Bloque I: Termodinámica
Moran, Michael J.	Fundamentos de termodinámica técnica	Reverté		84-291-4313-0	2004	Bibliografía básica para el Bloque I: Termodinámica