



## 1. General information

Course: AEROESPACE VEHICLES

Type: CORE COURSE

Degree: 403 - UNDERGRADUATE DEGREE PROGRAMME IN AEROSPACE  
ENGINEERING

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

Year: 4

Main language: Spanish

Use of additional  
languages:

Web site:

Code: 56733

ECTS credits: 6

Academic year: 2023-24

Group(s): 40

Duration: First semester

Second language:

English Friendly: Y

Bilingual: N

Lecturer: JOSÉ IGNACIO NOGUEIRA GORIBA - Group(s): 40

Building/Office	Department	Phone number	Email	Office hours
Sabatini/1.45	MECÁNICA ADA. E ING. PROYECTOS	926295300	Joselgnacio.Nogueira@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
CA01	Ability to carry out bibliographic searches, use databases and other sources of information for its application in tasks related to Technical Aeronautical Engineering.
CA02	Ability to efficiently design experimentation procedures, interpret the data obtained and specify valid conclusions in the field of Aeronautical Technical Engineering.
CA03	Ability to autonomously select and carry out the appropriate experimental procedure, operating the equipment correctly, in the analysis of phenomena within the scope of Engineering.
CA04	Ability to select advanced tools and techniques and their application in the field of Aeronautical Technical Engineering.
CA05	Knowledge of the methods, techniques and tools as well as their limitations in the application for the resolution of problems typical of Aeronautical Technical Engineering.
CA06	Ability to identify and assess the effects of any solution in the field of Aeronautical Technical Engineering within a broad and global context and the ability to interrelate the solution to an engineering problem with other variables beyond the technological field, which must be considered.
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
CE17	Knowledge applied to engineering of: The fundamental elements of the various types of aircraft; the functional elements of the air navigation system and the associated electrical and electronic installations; the fundamentals of airport design and construction and its various elements.
CE18	Knowledge applied to Engineering of: The fundamentals of fluid mechanics; the basic principles of flight control and automation; the main characteristics and physical and mechanical properties of materials.
CE19	Applied knowledge of: materials science and technology; mechanics and thermodynamics; fluid mechanics; aerodynamics and mechanics of flight; air traffic and navigation systems; aerospace technology; structure theory; air Transport; economy and production; Projects; environmental impact.
CE20	Knowledge applied to Engineering of: The fundamentals of sustainability, maintainability and operability of space systems.
CE24	Knowledge applied to Engineering of: The physical phenomena of the flight of aerial defense systems, their qualities and their control, actions, stability and automatic control systems.
CE25	Knowledge applied to Engineering of: The methods of calculation and development of defense materials and systems; the management of experimental techniques, equipment and measuring instruments typical of the discipline; the numerical simulation of the most significant physical-mathematical processes; inspection, quality control and fault detection techniques; the most appropriate repair methods and techniques.
CE26	Applied knowledge of: aerodynamics; flight mechanics, air defense engineering (ballistics, missiles and air systems), space propulsion, materials science and technology, structural theory.
CG01	Capacity for the design, development and management in the field of aeronautical engineering that have as their object, in accordance with the knowledge acquired as established in section 5 of order CIN/308/2009, aerospace vehicles, propulsion systems aerospace, aerospace materials, airport infrastructures, air navigation infrastructures and any space, traffic and air transport management system.
CG02	Planning, drafting, direction and management of projects, calculation and manufacturing in the field of aeronautical engineering that have as their object, in accordance with the knowledge acquired as established in section 5 of order CIN/308/2009, aerospace vehicles, aerospace propulsion systems, aerospace materials, airport infrastructures, air navigation infrastructures and any space, traffic and air

CG03	Installation, operation and maintenance in the field of aeronautical engineering that have as their object, in accordance with the knowledge acquired as established in section 5 of order CIN/308/2009, aerospace vehicles, aerospace propulsion systems, materials aerospace, airport infrastructure, air navigation infrastructure and any space, traffic and air transport management system.
CG04	Verification and Certification in the field of aeronautical engineering that have as their object, in accordance with the knowledge acquired as established in section 5 of order CIN/308/2009, aerospace vehicles, aerospace propulsion systems, aerospace materials , airport infrastructures, air navigation infrastructures and any space, traffic and air transport management system.
CG05	Ability to carry out activities of projection, technical direction, expert opinion, report writing, opinions, and technical advice on tasks related to Aeronautical Technical Engineering, exercise of functions and genuine aerospace technical positions.
CG06	Ability to participate in flight test programs to collect data on takeoff distances, climb rates, stall rates, maneuverability, and landing capabilities.
CG08	Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Aeronautical Technical Engineer.
CT01	Knowledge of technical vocabulary of subjects related to aerospace engineering, in a second foreign language.
CT02	Knowledge and application of Information and Communication Technologies (ICT).
CT03	Correct use of oral and written communication.
CT04	Knowledge of ethical commitment and professional ethics.

## 5. Objectives or Learning Outcomes

### Course learning outcomes

Not established.

## 6. Units / Contents

Unit 1:

Unit 2:

Unit 3:

Unit 4:

## 7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (practical) [ON-SITE]	Lectures	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	1.6	40	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	0.4	10	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	0.24	6	Y	Y	
Practicum and practical activities report writing or preparation [OFF-SITE]	Cooperative / Collaborative Learning	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	0.6	15	Y	Y	
Study and Exam Preparation [OFF-SITE]	Self-study	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	3	75	N	-	
Final test [ON-SITE]	Assessment tests	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE17 CE18 CE19 CE20 CE24 CE25 CE26 CG01 CG02 CG03 CG04 CG05 CG06 CG08 CT01 CT02 CT03 CT04	0.16	4	Y	Y	
<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
Practicum and practical activities reports assessment	10.00%	10.00%	
Final test	70.00%	70.00%	
Assessment of problem solving and/or case studies	20.00%	20.00%	
<b>Total:</b>	<b>100.00%</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>
Class Attendance (practical) [PRESENCIAL][Lectures]	6
Practicum and practical activities report writing or preparation [AUTÓNOMA][Cooperative / Collaborative Learning]	15
Final test [PRESENCIAL][Assessment tests]	4
<b>Unit 1 (de 4):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (practical) [PRESENCIAL][Lectures]	16
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	27
<b>Unit 2 (de 4):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (practical) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
<b>Unit 3 (de 4):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (practical) [PRESENCIAL][Lectures]	16
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	28
<b>Unit 4 (de 4):</b>	
<b>Activities</b>	<b>Hours</b>
Class Attendance (practical) [PRESENCIAL][Lectures]	4
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
<b>Global activity</b>	
<b>Activities</b>	<b>hours</b>
Practicum and practical activities report writing or preparation [AUTÓNOMA][Cooperative / Collaborative Learning]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	71
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Class Attendance (practical) [PRESENCIAL][Lectures]	46
Final test [PRESENCIAL][Assessment tests]	4
<b>Total horas: 146</b>	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Charles D. Brown	Elements of spacecraft design	American Institute of Aeronautics and Astronautics. Inc		1-56347-524-3	2002	
Anderson, John D.	Aircraft performance and design	McGraw-Hill		978-0-07-070245-5	2012	Fifth reprint