UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: VIBRATIONS AND AEROELASTICITY
Code: 56730
Type: CORE COURSE
ECTS credits: 6
Degree: 403 - UNDERGRADUATE DEGREE PROGRAMME IN AEROSPACE ENGINEERING
Academic year: 2023-24
Center: 303 - E.DE INGENIERÍA INDUSTRIAL Y AEROESPOACIAL DE TOLEDO
Group(s): 40
Year: 4
Duration: First semester
Main language: Spanish
Second language: English
Use of additional languages:
English Friendly: Y
Web site:
Bilingual: N

Lecturer: **ANTONIO GONZALEZ RODRIGUEZ** - Group(s): **40**

Building/Office	Department	Phone number	Email	Office hours
Sabatini/Buhardilla	MECÁNICA ADA. E ING. PROYECTOS	925268800 Ext. 3804	antonio.gonzalez@uclm.es	

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

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Sabatini/1.45	MECÁNICA ADA. E ING. PROYECTOS	926295300	JoseIgnacio.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
CE02	Understanding and command of the basic concepts of the general laws of mechanics, thermodynamics, fields and waves and electromagnetism and their application to solve engineering problems.
CE05	Capacity for spatial vision and knowledge of graphic representation techniques, both by traditional methods of metric geometry and descriptive geometry, and through computer-aided design applications.
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 transport management system.
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.
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.
CG07	Ability to analyze and assess the social and environmental impact of technical solutions.

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.
CT05	Knowledge of the principles of management skills and teamwork.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge of the problems related to aeroelasticity, numerical modelling, and quantification of their effects.

Knowledge and interpretation of the operation of machines and machine components in terms of their vibratory nature, as well as to be able to manage, design or modify them.

Additional outcomes

6. Units / Contents

Unit 1:

Unit 2:

Unit 3:

Unit 4:

Unit 5:

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	CA01 CA05 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03	0.9	22.5	N	-	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	CA01 CA05 CA06 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03	0.9	22.5	N	-	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	CA01 CA02 CA03 CA04 CA05 CA06 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03	0.26	6.5	N	-	
Class Attendance (practical) [ON-SITE]	Practical or hands-on activities	CA01 CA02 CA03 CA04 CA05 CA06 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03	0.06	1.5	N	-	
Group tutoring sessions [ON-SITE]	Problem solving and exercises	CA01 CA05 CA06 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03	0.16	4	N	-	
Writing of reports or projects [OFF-SITE]	Group Work	CA01 CA02 CA03 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02 CT03 CT04 CT05	0.5	12.5	Y	N	
Study and Exam Preparation [OFF-SITE]	Self-study	CA01 CA04 CA05 CA06 CB02 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT02	3.1	77.5	N	-	
Final test [ON-SITE]	Assessment tests	CA06 CB02 CB03 CB04 CB05 CE02 CE05 CG01 CG02 CG03 CG05 CG06 CG07 CG08 CT01 CT03 CT04	0.12	3	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
Final test	70.00%	100.00%	
Projects	30.00%	0.00%	
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
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	6.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	1.5
Group tutoring sessions [PRESENCIAL][Problem solving and exercises]	4
Writing of reports or projects [AUTÓNOMA][Group Work]	12.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	10
Final test [PRESENCIAL][Assessment tests]	3

Unit 1 (de 5):

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5

Unit 2 (de 5):

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	15

Unit 3 (de 5):

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5

Unit 4 (de 5):

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	7.5

Unit 5 (de 5):

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	10
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	10
Study and Exam Preparation [AUTÓNOMA][Self-study]	30

Global activity

Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	22.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	22.5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	6.5
Writing of reports or projects [AUTÓNOMA][Group Work]	12.5
Final test [PRESENCIAL][Assessment tests]	3
Group tutoring sessions [PRESENCIAL][Problem solving and exercises]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	77.5
Total horas:	148.5

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
P. García -Fogeda, J. López Díez	Apuntes de Aeroleslasticidad	Publicaciones de la U. Politécnica de Madrid			1992	
Singiresu S. Rao	Vibraciones Mecánicas	Pearson		978-607-32-0952-6	2011	