UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course:	SYSTEMS AND FLUID MACHINES	**Code:**	56322
Type:	CORE COURSE	**ECTS credits:**	6
Degree:	353 - UNDERGRADUATE DEGREE PROG. IN MECHANICAL ENGINEERING (CR)	**Academic year:**	2022-23
Center:	602 - E.T.S. INDUSTRIAL ENGINEERING OF C. REAL	**Group(s):**	20
Year:	3	**Duration:**	First semester
Main language:	Spanish	**Second language:**	English
Use of additional languages:		**English Friendly:**	Y
Web site:		**Bilingual:**	N

Lecturer: **GONZALO RODRIGUEZ PRIETO** - Group(s): **20**

Building/Office	Department	Phone number	Email	Office hours
INEI	MECÁNICA ADA. E ING. PROYECTOS	926055036	gonzalo.rprieto@uclm.es	

2. Pre-Requisites

They must have a clear idea of the following fields of knowledge, initially acquired in previous courses:

Mathematical analysis
General classical mechanics
Fluid mechanics

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

Fluid engineering is one of the branches of engineering with the greatest number of applications in the world today, from the transportation of oil through large pipelines to the design of systems as humble as good tanks to store any fluid.

For this reason, its study is of basic importance in the training of any engineer, and more so in the case of an industrial engineer that is so wide-ranging. The relationship of the subject with the profession depends, of course, on the final destination of the student. If the company is related in any way to transport of any type of fluids will be greater than if that relationship does not exist. Regarding its relationship with other subjects, it is highly related to all Mathematics subjects, since it is one of its basic tools and all those that are in one way or another related to the transport of fluids, such as thermotechnics.

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.
A07	Knowledge of Information Technology and Communication (ITC).
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.
D06	Applied knowledge of the fundamentals of fluid mechanical systems and machinery.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Additional outcomes

Being a person and capable of questioning everything, with the healthy question of: And where does it come from and who says it?

6. Units / Contents

Unit 1: Review and introduction to fluid mechanics

Unit 2: Dimensional analysis

Unit 3: Viscous flow in ducts

Unit 4: Boundary layer
Unit 5: Introduction to hydraulic machines
Unit 6: Lubrication
Unit 7: Transient phenomena
Unit 8: EXAMPLE OF PROBLEM RESOLUTION: LAMINATE FLOW THROUGH POROUS TUBES

ADDITIONAL COMMENTS, REMARKS

The syllabus may undergo changes throughout the course motivated by the teaching and pace of the same

- Fundamental principles of turbomachinery and fluidomechanical systems:

Topics 1 to 4 and 6 to 8.

- Hydraulic Pumps and Turbines:

Topic 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	A03	1.04	26	N	-	
Problem solving and/or case studies [ON-SITE]	Project/Problem Based Learning (PBL)	A13	0.8	20	N	-	
Final test [ON-SITE]	Assessment tests	A02 A03 A04 A07 A10 A12 A13	0.2	5	Y	Y	
Group tutoring sessions [ON-SITE]	Guided or supervised work	A02 A04 A10 A12 A13 D06	0.2	5	N	-	
Laboratory practice or sessions [ON-SITE]	Self-study	A02 A03 A04 A07 A10 A12 A13 D06	0.16	4	Y	Y	
Study and Exam Preparation [OFF-SITE]			3.36	84	N	-	
Other off-site activity [OFF-SITE]		A02 A03 A04 A12 D06	0.24	6	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
Test	70.00%	70.00%	
Practicum and practical activities reports assessment	30.00%	30.00%	
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).

Evaluation criteria for the final exam:

Continuous assessment:

It will consist of problems and / or theoretical questions referring to the whole subject.

Non-continuous evaluation:

Evaluation criteria not defined

Specifications for the resit/retake exam:

A single exam covers the entire subject.

Specifications for the second resit / retake exam:

It is convenient to talk with the teacher before this special resit.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	**hours**
Unit 1 (de 8): Review and introduction to fluid mechanics	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5
Unit 2 (de 8): Dimensional analysis	

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5

Unit 3 (de 8): Viscous flow in ducts	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Laboratory practice or sessions [PRESENCIAL][Self-study]	4
Study and Exam Preparation [AUTÓNOMA][]	10.5

Unit 4 (de 8): Boundary layer	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5

Unit 5 (de 8): Introduction to hydraulic machines	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5

Unit 6 (de 8): Lubrication	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5

Unit 7 (de 8): Transient phenomena	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Study and Exam Preparation [AUTÓNOMA][]	10.5
Study and Exam Preparation [AUTÓNOMA][]	6

Unit 8 (de 8): EXAMPLE OF PROBLEM RESOLUTION: LAMINATE FLOW THROUGH POROUS TUBES	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	3.25
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	2.5
Final test [PRESENCIAL][Assessment tests]	5
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	5
Study and Exam Preparation [AUTÓNOMA][]	10.5

Global activity	
Activities	**hours**
Problem solving and/or case studies [PRESENCIAL][Project/Problem Based Learning (PBL)]	20
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	5
Laboratory practice or sessions [PRESENCIAL][Self-study]	4
Study and Exam Preparation [AUTÓNOMA][]	79.5
Class Attendance (theory) [PRESENCIAL][Lectures]	26
Final test [PRESENCIAL][Assessment tests]	5
Total horas:	139.5

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
						La bibliografía de la asignatura se dará en los primeros días de clase.