

**1. General information****Course:** SYSTEMS AND FLUID MACHINES**Type:** CORE COURSE**Degree:** 421 - UNDERGRADUATE DEGREE PROG. IN MECHANICAL ENGINEERING**Center:** 602 - E.T.S. INDUSTRIAL ENGINEERING OF C. REAL**Year:** 3**Main language:****Use of additional languages:** English, Spanish main language.**Web site:** Moodle page of the subject.**Code:** 56322**ECTS credits:** 6**Academic year:** 2022-23**Group(s):** 20**Duration:** First semester**Second language:** English**English Friendly:** Y**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	In order to provide an adequate attention to the student, timetable for in person meetings will be agreed by e-mail between student and profesor.

2. Pre-Requisites

In order to take this course to the maximum advantage, it is recommended that the student has achieved skills related to mathematical and physical problem solving. It is also advisable to have acquired skills in knowledge of the basic principles of fluid mechanics and its application to the resolution of problems in the field of engineering.

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

This course deals with the fundamentals of fluid-mechanical systems and machines and their practical application in the operation of hydraulic pumps and turbines.

4. Degree competences achieved in this course**Course competences**

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
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
CEM06	Applied knowledge of the fundamentals of fluid-mechanical systems and machinery.
CG03	Knowledge of basic and technological subjects to facilitate learning of new methods and theories, and provide versatility to adapt to new situations.
CG04	Ability to solve problems with initiative, decision-making, creativity, critical reasoning and to communicate and transmit knowledge, skills and abilities in the field of industrial engineering.
CG06	Ability to handle specifications, regulations and mandatory standards.
CT01	Knowledge of a second language.
CT02	Knowledge and application of information and communication technology.
CT03	Ability to communicate correctly in both spoken and written form.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

Use and application of the basic principles for design and dimensioning of hydraulic pump systems.

Use and application of the basic principles to other hydraulic systems.

Use and application of the basic principles for design and dimensioning of hydraulic turbine systems.

6. Units / Contents**Unit 1: Fundamental principles of turbomachines and fluidmechanical systems****Unit 2: Hydraulic pumps****Unit 3: Hydraulic turbines****ADDITIONAL COMMENTS, REMARKS**

The subtopic division of the course will be presented to the students on the first day of class.

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]	Combination of methods	CB03 CB04 CEM06 CG06 CT03	1.2	30	N	-	Normal classes with many questions
Problem solving and/or case studies [ON-SITE]	Combination of methods	CB01 CB02 CB03 CB04 CB05 CEM06 CG03 CG04 CG06 CT01 CT02 CT03	0.4	10	N	-	Presentation and problem solving classes
Class Attendance (practical) [ON-SITE]	Combination of methods	CB01 CB02 CB03 CB04 CB05 CEM06 CG03 CG04 CG06 CT01 CT02 CT03	0.6	15	Y	Y	Laboratory experimental classes
Formative Assessment [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CEM06 CG03 CG04 CG06 CT01 CT02 CT03	0.2	5	Y	Y	Exam with questions to develop and problems to solve.
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CEM06 CG03 CG04 CG06 CT01 CT02 CT03	3.6	90	N	-	Student own work.
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%	70.00%	Continuous and non-continuous: Problems and theoretical questions.
Laboratory sessions	30.00%	30.00%	Continuous: By means of a work to be presented. Non-continuous: A test on the same day of the final exam.
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:

Minimum grade in the experimental work: 4/10

Minimum grade in the exam: 4/10

Non-continuous evaluation:

Minimum grade in the experimental work: 4/10

Minimum grade in the exam: 4/10

Specifications for the resit/retake exam:

Same criteria than in the final exam.

Specifications for the second resit / retake exam:

Due to the fact that there is no scheduled date, students who wish to use this examination are kindly requested to contact the professor in advance to set a date and time.

The convocation will be resolved with a single exam.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Class Attendance (theory) [PRESENCIAL][Combination of methods]	30
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	10
Class Attendance (practical) [PRESENCIAL][Combination of methods]	15
Formative Assessment [PRESENCIAL][Assessment tests]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
General comments about the planning: Course planning may be subject to changes due to force majeure or other causes related to teaching.	
Global activity	
Activities	hours
Class Attendance (practical) [PRESENCIAL][Combination of methods]	15
Formative Assessment [PRESENCIAL][Assessment tests]	5
Class Attendance (theory) [PRESENCIAL][Combination of methods]	30
Problem solving and/or case studies [PRESENCIAL][Combination of methods]	10
Study and Exam Preparation [AUTÓNOMA][Self-study]	90
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Blas Zamora Parra y Antonio Viedma Robles	Máquinas Hidráulicas. Teoría y Problemas	Crai-UPCT Ediciones		97 88416 325 191		
Joseph María Bergada Graño	Mecánica de Fluidos. Problemas Resueltos https://upcommons.upc.edu/bitstream/handle/2099.3/36662/9788476539156.pdf	Ediciones UPC		97 88476 539 156		Edición electrónica
Claudio Mataix	Mecánica de Fluidos y Máquinas Hidráulicas.	Ediciones del Castillo				Bibliografía adicional se proporcionará el primer día de clase. Additional bibliography will be given in the first day lecture.
Frank M. White	Mecánica de Fluidos	Mc Graw Hill		97 88448 140 762		Quinta edición en Español
Jose Agüero Soriano	Mecánica de Fluidos incompresibles y turbomáquinas hidráulicas	Ciencia 3	Córdoba	84 95391 01 05		