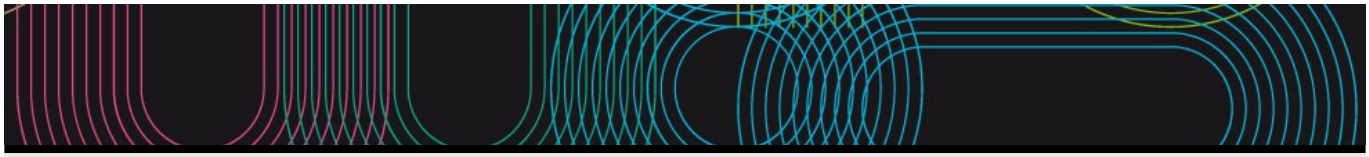
Universidade Vigo

Subject Guide 2018 / 2019



IDENTIFYING DATA				
Hydraulic Machines				
Subject	Hydraulic Machines			
Code	V04M141V01116			
Study programme	(*)Máster Universitario en Enxeñaría Industrial			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Mandatory	1st	1st
Teaching language				
Department	Mechanical Engineering, Heat Engines & Machines, and Fluids			
Coordinator	Martín Ortega, Elena Beatriz			
Lecturers	Martín Ortega, Elena Beatriz Meis Fernández, Marcos			
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Web				
General description	*Matería That *capacita to analyse and project machines of fluids, his installations and his exploitation. Likewise *capacita to project pneumatic and hydraulic installations and *dimensionar his elements			

Competencies	
Code	
C1	CET1. Project, calculate and design products, processes, facilities and plants.
C9	CET9. Knowing how to communicate the conclusions -and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously.
C10	CET10. Possess learning skills that will allow further study of a self-directed or autonomous mode.
C16	CTI5. Knowledge and skills for the design and analysis of thermal machines and engines, hydraulic machines and facilities for heat and industrial refrigeration
D1	ABET-a. An ability to apply knowledge of mathematics, science, and engineering.
D3	ABET-c. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
D5	ABET-e. An ability to identify, formulate, and solve engineering problems.
D11	ABET-k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Learning outcomes		
Expected results from this subject	Training and Learning Results	
Capacity to analyse and project machines of fluids, his installations and his exploitation	C1 C9 C10 C16	D1 D3 D5 D11
Capacity to project pneumatic and hydraulic installations and for *dimensionar his elements	C1 C9 C10 C16	D1 D3 D5 D11

Contents	
Topic	
1. *Introduccion	General theory of the design of hydraulic Machines
2. Design of *turbobombas	1. Design of *turbobombas radial or centrifugal 2. Design of *turbobombas axial and diagonals 3. Constitutive elements of *turbobombas 4. Selection and regulation of bombs

3. Design of turbines of action and reaction	Turbines of action: 1. Project of turbines *Pelton Turbines of reaction: 2. Project of axial turbines. *Kaplan 3. Project of radial turbines. Francis 4. Constitutive elements of hydraulic turbines 5. Hydroelectric head offices
4. *Turbomáquinas Compound. Hydrodynamic transmissions	1. Classification 2. General theory 3. *Turboacoplamientos 4. *Turboacoplamientos With variators of speed 5. *Turboconvertidores Of pair 6. Multiple hydraulic transmissions 7. Hydrodynamic brake
5. Design and selection of pneumatic elements	Design of *MNDP Pneumatic Machines of Positive Trip: Compressors, Engines and linear Actuators
6. Design and selection of hydraulic elements	Design of valves *hidraulicas: Valves and elements of control, constitutive of the hydraulic circuits Design of elements of hydraulic: Design of Auxiliary Elements of the *Circuítos Hydraulic
You practise	1. Design of hydraulic Machine through *CFD. Software *Fluent 2. Exit of study for visit to company related with the sector. It will realise in function of the availability of the companies

Planning

	Class hours	Hours outside the classroom	Total hours
Problem solving	6	6	12
Studies excursion	3	0	3
Computer practices	1.5	0	1.5
Supervised work	9.5	0	9.5
Lecturing	9	5	14
Other	3	0	3

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Problem solving	Resolution of problems or exercises of practical character and/or theorist
Studies excursion	Visits to company/*s of the zone related with the design of *turbomáquinas hydraulic. They will realise in function of the availability or no of the companies
Computer practices	Practices of design of machines with software *Fluent
Supervised work	Works in group of design of components of Hydraulic Machines
Lecturing	Classes in classroom

Personalized attention

Assessment

	Description	Qualification	Training and Learning Results	
Studies excursion	They will realise in function of the availability of the companies. In case of not being possible his realisation will carry out sessions of computer practices *evaluables by this 10%	10	C1 C9 C10 C16	D1 D3 D5 D11
Computer practices	It will evaluate the final practice realised by the student	10	C1 C9 C10 C16	D1 D3 D5 D11
Supervised work	It will evaluate the work realised on the design of the *MH assigned	50	C1 C9 C10 C16	D1 D3 D5 D11

Other	Examen/es de evaluación continúa de los contenidos impartidos en la asignatura	30	C1 C9 C10 C16	D1 D3 D5 D11

Other comments on the Evaluation

La evaluación continua representa el 50% de la nota, que se guardará para la segunda convocatoria y se evaluará en las sesiones de prácticas (10%), en la asistencia a la salida de estudio (10%) y en el/los examen/es de evaluación continua (30%). El 50% restante se evaluará con un trabajo en grupo de diseño de componentes/máquinas hidráulicas.

No es necesario sacar una nota mínima en cada parte para hacer la media de la asignatura

Los alumnos a los que se les haya concedido oficialmente la renuncia a la Evaluación Continua el trabajo en grupo de diseño de componentes/máquinas hidráulicas tendrá un peso de un 100% de la calificación final en la asignatura

Segunda convocatoria: La evaluación continua (50%) se guardará para la segunda convocatoria. El 50% restante se evaluará con un trabajo de diseño de componentes/máquinas hidráulicas.

Compromiso ético: Se espera que el alumno presente un comportamiento ético adecuado. En el caso de detectar un comportamiento no ético (copia, plagio, utilización de aparatos electrónicos no autorizado, y otros) se considera que el alumno no reúne los requisitos necesarios para superar la materia. En este caso la calificación global en el actual curso académico será de suspenso (0.0).

Sources of information

Basic Bibliography

Viedma A., Zamora B., **Teoría y Problemas de máquinas hidráulicas**, 3º Ed., Horacio Escarabajal Editores., 2008

Mataix, C., **Turbomáquinas Hidráulicas**, Editorial ICAI, 1975

Mataix, C., **Mecánica de Fluidos y Máquinas Hidráulicas**, Editorial del Castillo S.A., 1986

Complementary Bibliography

Hernández Krahe, J. M., **Mecánica de Fluidos y Máquinas Hidráulicas**, UNED, 1998

Creus, A., **Neumática e Hidráulica.**, Marcombo Ed., 2011

Karassik, I. J., **Pump Handbook,**, 2ª ed., Nueva York, McGraw-Hill., 1986

Krivchenko, G, **Hydraulic Machines: Turbines and Pumps**, 2ª ed., Lewis, 1994

Nechleba, M.,, **Hydraulic Turbines**, Constable, London, 1957

Recommendations