



## Teaching Guide

Identifying Data					2021/22
Subject (*)	Propulsion Systems	Code	730496218		
Study programme	Mestrado Universitario en Enxeñaría Naval e Oceánica (plan 2018)				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	1st four-month period	First	Optional	6	
Language	SpanishEnglish				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Naval e IndustrialEnxeñaría Naval e Oceánica				
Coordinador	Piñon Quiñonero, Manuel	E-mail	manuel.pinon@udc.es		
Lecturers	Piñon Quiñonero, Manuel	E-mail	manuel.pinon@udc.es		
Web					
General description	<p>O obxectivo desta materia é complementar os coñecementos do alumnado que procede dos Grados de Arquitectura Naval ou que non tiveran cursado asignaturas relacionadas cos sistemas de propulsión de buques.</p> <p>Nesta materia abordarase o estudo dos sistemas de propulsión do buque no seu conxunto, incluíndo tanto os conceptos básicos para o proxecto dos mesmos, as normas e os procedementos para a súa instalación e o seu mantemento e os procesos de construción e instalación dos equipos propulsores, abordando os cinco tipos principais de plantas de propulsión actuais: mediante motores diesel, turbinas de gas, turbinas de vapor, propulsión eléctrica e sistemas combinados.</p>				
Contingency plan	<ol style="list-style-type: none"> <li>1. Modifications to the contents</li> <li>2. Methodologies <ul style="list-style-type: none"> <li>*Teaching methodologies that are maintained</li> <li>*Teaching methodologies that are modified</li> </ul> </li> <li>3. Mechanisms for personalized attention to students</li> <li>4. Modifications in the evaluation <ul style="list-style-type: none"> <li>*Evaluation observations:</li> </ul> </li> <li>5. Modifications to the bibliography or webgraphy</li> </ol>				

## Study programme competences

Code	Study programme competences
B12	G07 Capacidade de integración de sistemas marítimos complexos e de tradución en solucións viables.
C2	C1 Capacidade pra desenrolar a actividade profesional nun entorno multilingue
C7	ABET (e) An ability to identify, formulate, and solve engineering problems.

## Learning outcomes

Learning outcomes	Study programme competences



Que o alumno coñeza no seu conxunto os sistemas de propulsión de buques actuais, así como os conceptos básicos para o proxecto dos mesmos, as normas e os procedementos para a súa instalación e o seu mantemento e que saiba dirixir, planificar e controlar os proxectos e os procesos de construción e instalación dos equipos propulsores		BJ7	CC2 CC7
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Contents	
Topic	Sub-topic
Os bloques e temas seguintes desarrollan os contidos establecidos na ficha da Memoria de Verificación, que son:  Sistemas de propulsión convencionales. Características, selección e dimensionado. Propulsión eléctrica de buques. Características, selección e dimensionado. Sistemas combinados de propulsión. Características, selección e dimensionado. Disposición da maquinaria como parte integrada en el proxecto de un buque. Desarrollo del proxecto técnico, elaboración de planos de disposición del sistema de propulsión e estrategia constructiva de cámara de máquinas.	.
Introduction to the marine propulsion systems	Introduction
Diesel engines	Introduction Working principles Diesel engine selection Ancilliary systems Engine room arrangement
Gas turbines	Introduction Working principles Marine gas turbines Ancilliary systems Engine room arrangement
Steam turbines	Introduction Working principles Ancilliary systems Conventional steam propulsion plants Nuclear steam propulsion plants Engine room arrangement
Electric propulsion	Introduction Working principles Electric generator selection Electric motor selection Associated propulsors
Combined propulsion systems	Introduction Propulsion plant arrangement Propulsion plant selection and associated systems
Machinery arrangement within the ship design process	Introduction Design constraints Rules and regulations Building strategy



Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Supervised projects	B12 C2 C7	5	25	30
Supervised projects	B12 C2 C7	5	5	10
Oral presentation	B12 C2 C7	4	0	4
Objective test	B12 C2 C7	4	0	4
Problem solving	B12 C2 C7	15	10	25
Guest lecture / keynote speech	B12 C2 C7	31	44	75
Personalized attention		2	0	2

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

Methodologies	
Methodologies	Description
Supervised projects	To develop the design of the engine room of a given vessel, that will be defined at the beginning of the course. On it, some of the knowledge acquired along the course will have to be applied.  At the beginning of the course, and depending on the number of students, it will be decided if the project has to be done individually or in groups of students.
Supervised projects	To develop a project work about a given topic within the contents of the course, that will be defined at the beginning of it. This project will be orally presented.  At the beginning of the course, and depending on the number of students, it will be decided if the project has to be done individually or in groups of students.
Oral presentation	Oral presentation of the project work about a topic of the course, in front of the professor and the rest of the students. Moreover, the student will also evaluate the oral presentations of the rest of the groups
Objective test	Theoretical/practical written examination about the different contents of the course.
Problem solving	Resolución de problemas prácticos de cada un dos temas nos que se divide a asignatura, tanto polo profesor como polos propios alumnos, en sesións presenciais.
Guest lecture / keynote speech	Lecture sessions where the contents of the course will be explained and described by the professor.

Personalized attention	
Methodologies	Description
Supervised projects Oral presentation Supervised projects	Regarding the two project works to be carried out during the course, individualized guiding sessions will be done, where bibliographic references, information sources and advice will be provided at the different stages of development of both works, also including oral presentation basic techniques.

Assessment			
Methodologies	Competencies	Description	Qualification
Problem solving	B12 C2 C7	A asistencia a máis do 75 % de devanditas sesións corresponderase cun máximo do 5 % da nota final do alumno.	5
Supervised projects	B12 C2 C7	The maximum assigned score to the project work about a specific topic is a 5 % of the total score of the course. It is a compulsory assignment that has to be accomplished to pass the course.  Its maximum score will be 10 points. A minimum of 4 points are required to pass the course.	5



Objective test	B12 C2 C7	<p>Theoretical/practical written examination about the different contents of the course.</p> <p>The maximum assigned score to this item is a 6 % of the total score of the course. It is a compulsory assignment that has to be accomplished to pass the course.</p> <p>Its maximum score will be 10 points. A minimum of 4 points are required to pass the course.</p>	60
Oral presentation	B12 C2 C7	<p>The maximum assigned score to the oral presentation of the project work about a specific topic, together with the evaluation of the other presentations, is a 5 % of the total score of the course. It is a compulsory assignment that has to be accomplished to pass the course.</p> <p>Its maximum score will be 10 points. A minimum of 4 points are required to pass the course.</p>	5
Supervised projects	B12 C2 C7	<p>Project work about the design of the engine room of a ship.</p> <p>This work has a maximum assigned score of a 30 % of the total score of the course. It is a compulsory assignment that has to be accomplished to pass the course.</p> <p>Its maximum score will be 10 points. A minimum of 4 points are required to pass the course.</p>	25

### Assessment comments

Os requisitos que aqueles alumnos con dispensa de asistencia a clase

terán que cumprir, tanto en primeira como en segunda oportunidade, serán

os mesmos requisitos que aqueles sen esta dispensa, coas seguintes

excepcións:

- Non será necesaria a realización da presentación oral do traballo

tutelado dun tema específico da asignatura. Polo tanto, neste caso, a puntuación asignada a este apartado (traballo tutelado dun tema específico)

será dun 10 % do total da

cualificación.

- A puntuación asignada á asistencia aos apartados de "Solución de

problemas" e "Sesións maxistras", asignarase á "Proba obxectiva". Así,

nestes casos, a cualificación da proba obxectiva será dun 70 %.

Esta asignatura acepta a dispensa académica de aqueles alumnos matriculados a tempo parcial. Os alumnos con dispensa académica poden seguir a

asignatura sen asistir a clase e contan co apoio do profesor en tutorías cando o necesiten. Serán avaliados exclusivamente por a nota obtida no

examen tanto na primeira como na segunda oportunidade

Para todos os alumnos, os requisitos de la segunda oportunidade son iguais a los de la primera oportunidade

Los alumnos de la convocatoria extraordinaria de diciembre serán avaliados exclusivamente por la nota obtenida en el examen.

?La realización fraudulenta de las pruebas o actividades de evaluación implicará directamente la cualificación de suspenso '0' en la materia en la

convocatoria correspondiente, invalidando así cualquier cualificación obtenida en todas las actividades de evaluación de cara a la convocatoria

extraordinaria"

### Sources of information



<b>Basic</b>	- Casanova Rivas, E. (2001). Máquinas para la Propulsión de Buques. Universidade da Coruña - Watson, D.G.M. (2002). Practical Ship Design. Elsevier - Lamb, T. (2003). Ship Design and Construction. Society of Naval Architects and Marine Engineers (SNAME)
<b>Complementary</b>	

## Recommendations

### Subjects that it is recommended to have taken before

### Subjects that are recommended to be taken simultaneously

Marine Internal Combustion Engines/730496017

### Subjects that continue the syllabus

Design and optimization of power and propulsion plants /730496005

### Other comments

Para axudar a conseguir unha contorna inmediata sustentable e cumprir co obxectivo da acción número 5: "Docencia e investigación saudable e sustentable ambiental e social" do "Plan de Acción Green Campus Ferrol" precisase incluír nas nosas guías docentes o seguinte: 1.- A entrega dos traballos documentais que se realicen nesta materia: 1.1. Solicitárase en formato virtual e/ou soporte informático 1.2. Realízase a través de Moodle, en formato dixital sen necesidade de imprimilos 1.3. De se realizar en papel: - Non se empregarán plásticos.- Realízanse impresións a dobre cara.- Empregarase papel reciclado.- Evítase a impresión de borradores. 2.- Débese facer un uso sostible dos recursos e a prevención de impactos negativos sobre o medio natural

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.