

SUBJECT TEACHING GUIDE

1186 - Generation, Transport and Distribution of Energy

Master's Degree in Marine Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Master's Degree in Marine Engineering			Type and Year	Compulsory. Year 1
Faculty	School of Maritime Engineering				
Discipline	Generation, Transport and Distribution of Energy				
Course unit title and code	1186 - Generation, Transport and Distribution of Energy				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web	https://moodle.unican.es/				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Combination of face-to-face and online training

Department	DPTO. CIENCIAS Y TECNICAS DE LA NAVEGACION Y DE LA CONSTRUCCION NAVAL				
Name of lecturer	JUAN ANTONIO CARDONA PARDO				
E-mail	juan.cardona@unican.es				
Office	E.T.S. de Náutica. Planta: + 2. DESPACHO (240)				
Other lecturers	CARLOS JAVIER RENEDO ESTEBANEZ DAVID SALVADOR SANZ SANCHEZ				

3.1 LEARNING OUTCOMES	
- Students will learn the principles of the generation and use of thermal energy in marine facilities and the principles of systems for the generation, transport and distribution of electrical energy	
- Plan and schedule operations in accordance with SCTW Convention Rule III / 2, as amended	
- Manage the operation of the electrical and electronic control equipment in accordance with Regulation III / 2 of the SCTW Convention, as amended.	

4. OBJECTIVES

Know, understand and apply the fundamental aspects of the analysis of the thermal uses of alternative internal combustion engines and steam generators of a ship, as well as the systems of generation, transport and distribution of electrical energy

Know the theoretical principles of: thermofluids

Know the theoretical principles of: propulsion characteristics of diesel engines, including speed, power and fuel consumption

Know the theoretical principles of: thermal performance and thermal balance of the following engines: marine steam boilers

Know the theoretical principles of: marine electrotechnology and safety devices

Know the theoretical principles of: project characteristics and system configurations of the safety equipment for the following machines: generator and distribution system

Know the theoretical principles of: project characteristics of high voltage installations

6. SUBJECT PROGRAM

CONTENTS

1	GENERATION, TRANSPORT AND DISTRIBUTION OF THERMAL ENERGY
1.1	Thermal Energy Generation: Energy audit, powers and performances in internal combustion engines. Energy audit of a steam generator.
1.2	Transport and Distribution of Thermal Energy: T. and D. of T. E. with Liquid, Hydraulic Balancing T. and D of T. E. with Steam
2	GENERATION, TRANSPORTATION AND DISTRIBUTION OF ELECTRIC ENERGY
2.1	Generation of Electric Power: Generating power plant
2.2	Transport and Distribution of Electric Energy: Calculation of transport and distribution lines.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Non face to face theoretical evaluation	Activity evaluation with Virtual Media	No	Yes	40,00
One-site practical exercises evaluation	Written exam	No	Yes	60,00
TOTAL				100,00
Observations				
<p>The established cut marks correspond to: the problems (of the entire subject), and the theory (of the entire subject, either through the works or through a theory test).</p> <p>Neither the problems nor the works (or the theory that recovers them) are approved in parts. The part of the problems is approved or suspended; and the part of the works (or the theory that recovers them) is approved or suspended.</p> <p>In the extraordinary call the following is recovered: all the recoverable part of the subject, the problem part of the whole subject, or the theory part of the whole subject.</p> <p>The exams do not necessarily include problems or theory questions of all the topics or lessons developed in the course.</p> <p>IT IS EXPECTED THAT, IN THE EVENT THAT THE SOCIAL DISTANCE DISTANCE MEASURES ESTABLISHED BY THE SANITARY AUTHORITIES DO NOT ALLOW THE EVALUATIONS OF: THE "TEST TESTING" AND THE THEORY TEST (TO RECOVER THEM) , THE EVALUATION WILL BE PERFORMED:</p> <p>A) THE 'GROUP TESTS' WILL NOT BE CONDUCTED, AND THEIR WEIGHTING IN THE FINAL NOTE (10%) WILL ADD TO THE PROBLEM EXAMINATION, WHICH WILL HAPPEN 60%.</p> <p>B) THE PROBLEM EXAM WILL BE DEVELOPED THROUGH MOODLE. IN THIS PLATFORM THE SPECIFIC CONDITIONS OF REALIZATION WITH THE SUFFICIENT ADVANCE WILL BE EXPLAINED.</p> <p>C) THE EXAMINATION OF THEORY (THAT RECOVERES THE SUSPENDED WORKS) WILL BE CARRIED OUT THROUGH MOODLE. IN THIS PLATFORM THE SPECIFIC CONDITIONS OF REALIZATION WITH THE SUFFICIENT ADVANCE WILL BE EXPLAINED. ADDITIONALLY, ORAL EXAMS MAY BE CONDUCTED USING JITSI, SKYPE OR OTHER SIMILAR MEDIA.</p> <p>D) STUDENTS WILL NEED TO HAVE THE DAY OF THE EXAMINATION OF: INTERNET CONNECTION, COMPUTER AND SCANNER OR PHOTO CAMERA.</p>				
Observations for part-time students				
They will be the same as for full-time students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Apuntes de la asignatura disponibles en la plataforma virtual.

Vicente Moreno Arenas. "Motores de Combustión Interna".

W.H. Severns / H.E. Degler / J.C. Miles. "Energía mediante vapor, aire o gas".

DEA Ingeniería, "Manual técnico de diseño y cálculo de redes de vapor", Ed: Junta de Castilla y León, Consejería de Economía y Empleo, Ente Regional de Energía de Castilla y León, 2010.

M. El-Hawary "Electrical Power Systems. Design and Analysis" IEEE Press.

D. T. Hall, "Practical Marine Electrical Knowledge", Ed Witherby.