SUBJECT TEACHING GUIDE

G1108 - Thermodynamics and Fluids Mechanics

Degree in Maritime Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Degree in Maritime Engineering			Type and Year	Compulsory. Year 2
Faculty	School of Maritime Engineering				
Discipline	Subject Area: Fluid Mechanics and Thermodynamics Module in Common with the Naval Branch				
Course unit title and code	G1108 - Thermodynamics and Fluids Mechanics				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA
Name of lecturer	CARLOS JAVIER RENEDO ESTEBANEZ
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Other lecturers	MANUEL ODRIOZOLA RODRIGUEZ ALICIA CRESPO GUTIERREZ

3.1 LEARNING OUTCOMES

- Know how to solve Thermodynamics problems
  Know how to solve problems of Fluid Mechanics

  DEGREE IN MARINE ENGINEERING
  Operate the main and auxiliary machinery and the corresponding control systems in accordance with Rule III / 1 of the SCTW Convention as amended
  Plan and schedule operations in accordance with Rule III / 2 of the SCTW Convention as amended
  Manage the operation of hydraulic and pneumatic equipment (pumps and compressors) controlled electrically and electronically in accordance with Rule III / 2 of the SCTW Convention as amended

4. OBJECTIVES
Get knowledge of thermodynamics and fluid mechanics, for application to the resolution of practical cases.
Be able to analyze the behavior of the basic power and cooling cycles
Marine Engineering Degree (CORRESPONDENCE TABLES WITH STCW RULE III/1) Understand the basic construction and operating principles of machinery systems, including auxiliary machinery such as various pumps, air compressors, purifiers, freshwater generators, heat exchangers, and refrigeration systems. Understand the basic construction and operating principles of machinery systems. (CORRESPONDENCE TABLES WITH STCW RULE III/2) Understand and apply the theoretical principles of Thermodynamics . Understand the theoretical principles necessary to control power-generating machinery in hydraulic and pneumatic systems.

6. SUBJECT PROGRAM	
CONTENTS	
1	SUBJECT PRESENTATION
2	Fundamental Concepts of Thermodynamics. Properties and Diagrams of Fluids.
3	Psychrometry
4	Combustion
5	Vapor Power Cycles
6	Refrigeration Cycles
7	Gas Power Cycles
8	Heat Transfer

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
PRACTICAL ASSESSMENT (Attendance, participation, and submission of lab reports).	Laboratory evaluation	No	Yes	20,00
PROJECT ASSESSMENT (Class assignments) (20%)	Written exam	No	Yes	20,00
WRITTEN ASSESSMENT (Final content exam) (60%)	Written exam	Yes	Yes	60,00
TOTAL				100,00

Observations

This subject is taught in Spanish. In case of discrepancy between the English and Spanish versions of the guide, the Spanish version shall prevail.

Attendance will only be considered valid when accompanied by a positive attitude (exclusive attention during the entire class or laboratory session).

Students who do not opt for the continuous assessment modality, or who do not meet the minimum attendance requirement, will be evaluated on the knowledge acquired throughout the course (theory, problems, and laboratory practices) through the ordinary exam.

In the ordinary exam, students may write on the classroom board as many formulas, diagrams, or constants as they deem necessary. Exercises are not permitted to be noted.

In the extraordinary exam, students may choose to take all three parts: (1) Laboratory test [20%], (2) Exam covering blocks 1 to 3 [20%], and (3) Exam covering blocks 4 to 7 [60%], or only the parts they consider. In the latter case, the grades obtained in the ordinary exam for the parts not taken will be maintained. For the resolution of the problems in this extraordinary exam, each student may submit to the responsible professor, at least three days in advance, a personal three-page formula sheet, which may include formulas, diagrams, or constants (solved problems are not allowed).

The use of programmable calculators or electronic communication devices is prohibited in all exams of the course.

No grade obtained will be carried over to subsequent academic years.

Observations for part-time students

They are evaluated under the same conditions as full-time students.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Transparencias utilizadas por el profesor para la impartición de la asignatura

Moodle de la asignatura

Termodinámica para Ingenieros; Potter, M, Somerton C; Ed MCGrawHill, 2004

Termodinámica; Kurt Rolle, Ed Pearson, 2006

DTIE 3.01: PSICROMETRIA, Jose Manuel Pinazo Ojer y Arcadio Garcia Lastra, Ed ATECYR, 2009