

## SUBJECT TEACHING GUIDE

### G1098 - Refrigeration: Special Transport

#### Degree in Marine Engineering First Degree in Marine Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Marine Engineering First Degree in Marine Engineering			Type and Year	Compulsory. Year 4 Optional. Year 3
Faculty	School of Maritime Engineering				
Discipline	Subject Area: Refrigeration: Special Transport				
Course unit title and code	G1098 - Refrigeration: Special Transport				
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. CIENCIAS Y TECNICAS DE LA NAVEGACION Y DE LA CONSTRUCCION NAVAL				
Name of lecturer	ALFREDO TRUEBA RUIZ				
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Other lecturers					

3.1 LEARNING OUTCOMES
- To know solve problems in refrigeration and air conditioning and special transport and dangerous goods.
- Operate the main and auxiliary machinery and the corresponding control systems.
- Operation, monitoring, evaluation of the performance and maintenance of the safety of the propulsion installation and auxiliary machinery.
- Contribute to the safe operation of oil, chemical and gas tankers.
- Take precautions to prevent risks on tankers, chemical tankers and gas carriers.
- Capacity to safely conduct and supervise all cargo operations on oil, chemical and gas tankers.

#### 4. OBJECTIVES

Train students in regard to the refrigeration at the operational level, according to the provisions of A-III/1 of the Code on Standards of Training, Certification and Watchkeeping for Seafarers (STCW-78):

- Preparation, operation, fault detection and measures necessary to prevent breakdowns in cooling, air conditioning and ventilation systems.

Train students in regard to the refrigeration at the control level, according to the provisions of A-III/2 of the Code on Standards of Training, Certification and Watchkeeping for Seafarers (STCW-78):

- Practical knowledge: functions and mechanisms for automatic control of a refrigeration system.

Provide students with advanced training for oil tanker cargo ships operations, according to the provisions of A-V/1-1-2 of the Code on Standards of Training, Certification and Watchkeeping for Seafarers (STCW-78).

Provide students with advanced training for chemicals cargo ships operations, according to the provisions of A-V/1-1-3 of the Code on Standards of Training, Certification and Watchkeeping for Seafarers (STCW-78).

Provide students with advanced training for liquefied gas cargo ships operations, according to the provisions of A-V/1-2-2 of the Code on Standards of Training, Certification and Watchkeeping for Seafarers (STCW-78).

#### 6. SUBJECT PROGRAM

##### CONTENTS

1	REFRIGERATION
1.1	Refrigerating methods.
1.2	Refrigerants.
1.3	Isolation techniques and construction of cold-storage plant.
1.4	Air conditioning.
2	SPECIALS TRANSPORTS
2.1	Oil tankers ships.
2.2	Liquefied gas tankers ships.
2.3	Chemicals ships.
2.4	Inert gas

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Refrigeration theory test	Written exam	No	Yes	30,00
Specials transports theory test	Written exam	No	Yes	30,00
Problems	Others	No	Yes	15,00
Group work	Work	Yes	No	10,00
Laboratory	Laboratory evaluation	No	Yes	15,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<p>- JUNE SESSION:</p> <p>1. (TE) Theory (60%)            Continuous evaluation: two partial exams that can be taken by students who attend at least 70% of the theory classes.            Refrigeration partial exam (30%): on a date to be agreed upon.            Partial exam on special transports (30%): on a date to be agreed upon.            To be made up in the final exam.            Final exam in June: of the subject not passed in the continuous evaluation, to be held on the date established in the exam calendar approved by the School Board.            The pass in TE is a condition to compute the rest of the parts of the subject in the final grade .</p> <p>2. (PA) Classroom practicals (15%)            Continuous evaluation:            Weekly resolution and delivery (in the classroom at the beginning of the class) of at least 70% of the problems proposed one week in advance: 7.5%.            Partial exam of problems that can be taken by students who at least deliver 70% of the problems proposed weekly: 7.5%.            Recoverable in the final exam.            Final exam in June: for those students who do not pass it by continuous evaluation, to be held on the date set in the exam calendar approved by the School Board.            Passing the PA is a condition to compute the rest of the parts of the course in the final grade .</p> <p>3. (TG) Group work (10%)            3.1. Elaborate the assigned work.            The work in its final form will be delivered through the Virtual Classroom 48 h before the date set in the schedule of exhibitions.            The contents of the work will be considered part of the course, and may be questioned in the theory exam.            3.2. Exhibition and defense according to the schedule of exhibitions.            Exhibition (30 min) of the work in its final form and evaluation and questions by the teacher and classmates (15 min).            To be graded it is a condition to participate in the exposition and defense of the work .            Not recoverable in the final exam.</p> <p>4. (PL) Laboratory practicals (15%)            Continuous evaluation:            Compulsory minimum attendance to 80% of the practical hours.            Positive evaluation of the memory of the practices carried out.            Recoverable in the final exam.            Final exam in June: for those students who do not pass it by continuous evaluation, to be held on the date set in the exam calendar approved by the School Board.            Passing the PL is a condition to compute the rest of the parts of the course in the final grade .</p> <p>- EXTRAORDINARY EXAM IN JULY:            Examination of the entire syllabus of the subject (TE, PA and PL) on the date set in the examination calendar approved by the School Board.            The grade obtained in the TG and PL in the June exam will be kept.</p>				
<b>Observations for part-time students</b>				
Non-mandatory attendance				

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

- Colegio Oficial de Ingenieros Agrónomos de Murcia. Nuevo curso de ingeniería del frío. Ediciones A. Madrid Vicente. 1993.
  - Holdsworth, S. D. Conservación de frutas y hortalizas. Editorial Acribia. 1988.
  - Plank, R. El empleo del frío en la industria de la alimentación. Editorial Reverté. 1980.
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  - Bermúdez, V. Tecnología energética. Universidad Politécnica Valencia. 2000.
  - Miranda, A.L. Aire acondicionado. Ediciones CEAC. 1994.
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- IMO. Convenio Internacional sobre Normas de Formación, Titulación y Guardia para la gente de Mar. STCW 78/2010.
  - IMO. Convenio internacional para prevenir la contaminación por los buques-MARPOL. Edición refundida de 2017.
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  - IMO. IMO-VEGA database. Det Norske Veritas. 2003
  - IMO. Código CIG – Código internacional para la construcción y el equipo de buques que transporten gases licuados a granel. Edición de 2016.
  - IMO. Código CIQ – Código internacional para la construcción y el equipo de buques que transporten productos químicos peligrosos a granel. Edición de 2007.
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  - Carro, L.; Martínez, J.A. Gases licuados. Colegio de Oficiales de la Marina Mercante (COMME). 1994.
  - China, J.L.; Hernández, V. Manual de lavado con crudo y gas inerte. Colegio de Oficiales de la Marina Mercante (COMME). 1994
  - Reigadas, I.G.; El buque tanque. Ediciones TGD. 2004
  - García, J.E.; Manual del buque tanque. COMME y Ministerio de Fomento. 2000.
  - Morán, J.R.; Casanueva, R.; Manual para buques de productos químicos. Colegio de Oficiales de la Marina Mercante (COMME). 1994.
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