

## Course guide

# 280657 - 280657 - Transport of Dangerous, Hazardous and Harmful Goods

Last modified: 27/05/2025

**Unit in charge:** Barcelona School of Nautical Studies  
**Teaching unit:** 742 - CEN - Department of Nautical Sciences and Engineering.  
**Degree:** BACHELOR'S DEGREE IN MARINE TECHNOLOGIES (Syllabus 2010). (Compulsory subject).  
**Academic year:** 2025    **ECTS Credits:** 4.5    **Languages:** Spanish

## LECTURER

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**Coordinating lecturer:** JOSEP ALBERT RIBET GÓMEZ  
  
Primer quadrimestre:  
JOSEP ALBERT RIBET GÓMEZ - Grup: DT, Grup: GTM  
  
**Others:** Primer quadrimestre:  
CRISTINA CAMPOS TORESANO - Grup: DT, Grup: GTM  
JOSEP ALBERT RIBET GÓMEZ - Grup: DT, Grup: GTM

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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### Specific:

GTM.CE34. Knowledge of different types of special transport dangerous goods by sea.

### Transversal:

SCS N3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.

## TEACHING METHODOLOGY

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- Receive, understand and synthesize the knowledge worked in class
- Posing and solving problems
- Works and practices in simulator

## LEARNING OBJECTIVES OF THE SUBJECT

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The student should know how to operate the loading and discharging systems of the special cargoes ships.

Competencies

The specifics CE.24, 25, 26 i 27

Additionally the ones of chart A-II/1 in the STCW convention: "Monitor de loading, stowage, securing, care during the voyage and the unloading of cargoes" partially and the chart A-II/2 of the STCW convention: "Carriage of dangerous goods" partially and of chart A-V/1 parts 1,2,3,4,5,6,7. Also of chart B-V/1 parts 13,14,15

Compliance of the IMO regulations for the obtention of the certificates of tanker ships, oil carriers, gas carriers and chemical carriers.

Learn the STCW competences:

Check the compliance of the legislation.

Basic practical knowledge of the IMO conventions for the safety of human life at sea and protection of marine environment.

## STUDY LOAD

Type	Hours	Percentage
Hours large group	39,0	34.67
Self study	67,5	60.00
Hours small group	6,0	5.33

**Total learning time:** 112.5 h

## CONTENTS

### 1. Basic training for oil and chemical tanker cargo operations

#### Description:

Provide training to students to be duly qualified under sections A-V/1-1 and B-V/1 of the STCW Code with specific duties and responsibilities related to cargo or cargo equipment on oil or chemical tankers.

- Introduction (Development of tankers ,types,piping system,cargo pumps, Types of cargoes, Tanker terminology, Rules and regulations)
- Toxicity and Other Hazards
- Hazard control
- Safety Equipment and Protection of personnel
- Pollution Prevention
- Cargo equipment
- Cargo operations

#### Specific objectives:

- \* Familiarization with the equipment, instrumentation and controls used for cargo handling on a tanker
- \* Greater awareness of the need of proper planning, the use of checklists and the time scales involved in the various cargo handling Operations
- \* Enhanced awareness to apply proper and safe procedures at all times when carrying out the various
- \* Operations on board and oil or chemical tanker
- \* Acquisition of experience in identify operational problems and assist in solving them
- \* Improvement in the ability to promote safety and protect the marine environment
- \* Increased ability to assist and coordinate actions during emergencies

#### Full-or-part-time: 22h

Theory classes: 9h 30m

Practical classes: 3h

Self study : 9h 30m

## 2. Advanced training for oil tanker cargo operations

### Description:

Provide training to students to meet the requirements of section A-V/1-1-2 and B-V/1.1 of the STCW Code with specific duties for loading, unloading and care in transit or handling of oil cargoes.

- Knowledge of oil tanker design, systems and equipment
- Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation
- Proficiency in tanker safety culture and implementation of safety management system
- Knowledge and understanding of monitoring and safety systems, including the emergency shutdown
- Loading, unloading, care and handling of cargo
- Knowledge of the effect of bulk liquid cargoes on trim, stability and structural integrity
- Knowledge and understanding of oil cargo related operations
- Development and application of cargo-related operation plans, procedures and checklists
- Ability to calibrate and use monitoring and gas detection systems, instruments and equipment
- Ability to manage and supervise personnel with cargo-related responsibilities
- Knowledge and understanding of the hazards and control measures associated with oil tanker cargo operations
- Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to oil tankers
- Knowledge and understanding of oil tanker emergency procedures
- Actions to be taken following collision, grounding, or spillage
- Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL), as amended, and other relevant IMO instruments, industry guidelines and port regulations as commonly applied

### Specific objectives:

- \* Familiarization with the equipment, instrumentation and controls used for cargo handling on an oil tanker
- \* A greater awareness of the need of proper planning, the use of checklists and the time scales involved in the various cargo handling Operations.
- \* An enhanced awareness to apply proper and safe procedures at all times when carrying out the various Operations on board an oil tanker
- \* An acquisition of experience in identifying operational problems and assist in solving them
- \* An improvement in the ability to promote safety and protect the marine environment
- \* An increased ability to assist and coordinate actions during emergencies

**Full-or-part-time:** 27h 15m

Theory classes: 12h 08m

Practical classes: 3h

Self study : 12h 07m

### 3. Advanced training for chemical tanker cargo operations

**Description:**

Provide training to students to be duly qualified, in accordance with section A-V/1-1-3 and B-V/1-1 of the STCW Code, with specific duties for loading, unloading and care in transit of chemical tanker cargoes

- Knowledge of chemical tanker designs, systems and equipments
- Knowledge of pump theory and characteristics, including types of cargo, pumps and their safe operations
- Proficiency in tanker safety culture and implementation of safety management system
- Knowledge and understanding of monitoring and safety systems, including the emergency shutdown system
- Ability to perform cargo measurement and calculations
- Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity
- Knowledge and understanding of chemical cargo-related operations
- Development and application of cargo-related operation plans, procedures and checklists
- Ability to calibrate and use monitoring and gas-detection systems, instruments and equipment
- Ability to manage and supervise personnel with cargo-related responsibilities
- Knowledge and understanding of the chemical and the physical properties of noxious liquid substances
- Understanding the information contained in a Safety Data Sheet (SDS)
- Knowledge and understanding of the hazards and control measures associated with chemical tanker cargo operations
- Knowledge and understanding of dangers of non-compliance with relevant rules/regulations
- Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to chemical tankers
- Knowledge and understanding of chemical tanker emergency procedures
- Actions to be taken following collision, grounding or spillage
- Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL) and other relevant IMO instruments, industry guidelines and port regulations as commonly applied
- Proficiency in the use of the IBC Code and related documents

**Specific objectives:**

- \* Familiarization with the equipment, instrumentation and controls used for cargo handling on an oil tanker
- \* A greater awareness of the need of proper planning, the use of checklists and the time scales involved in the various cargo handling Operations.
- \* An enhanced awareness to apply proper and safe procedures at all times when carrying out the various Operations on board an oil tanker
- \* An acquisition of experience in identifying operational problems and assist in solving them
- \* An improvement in the ability to promote safety and protect the marine environment
- \* An increased ability to assist and coordinate actions during emergencies

**Full-or-part-time:** 31h

Theory classes: 14h

Practical classes: 3h

Self study : 14h

#### 4. Basic training for liquefied gas tanker cargo operations

**Description:**

Provide training to candidates to be duly qualified under section A-V/1-2 and B-V/1.2 of the STCW Code with specific duties and responsibilities related to cargo or cargo equipment on liquefied gas tankers.

- Liquefied gas tankers
- Cargo operations
- Physical properties of liquefied gases
- Hazards associated with tanker operations
- Hazard controls
- Information on a Material Safety Data Sheet (MSDS)
- Safe working practices and procedures in accordance with legislation and industry guidelines and personal shipboard safety relevant to liquefied gas tankers
- Effects of pollution on human and marine life
- Shipboard procedures to prevent pollution
- Measures to be taken in the event of spillage

**Specific objectives:**

- \* Familiarization with the equipment, instrumentation and controls used for cargo handling on a liquefied gas tanker
- \* A greater awareness of the need of proper planning, the use of checklists and the time scales involved in the various cargo handling Operations.
- \* An enhanced awareness to apply proper and safe procedures at all times when carrying out the various Operations on board liquefied gas tanker
- \* An acquisition of experience in identifying operational problems and assist in solving them
- \* An improvement in the ability to promote safety and protect the marine environment
- \* An increased ability to assist and coordinate actions during emergencies

**Full-or-part-time:** 18h 30m

Theory classes: 7h 45m

Practical classes: 3h

Self study : 7h 45m

## 5. Advanced training for liquefied gas tanker cargo operations

### Description:

Provide training to candidates to be duly qualified under section A-V/1-2 and B-V/1.1 of the STCW Code with specific duties and responsibilities related to cargo or cargo equipment on liquefied gas tankers.

- Knowledge of liquefied gas tanker design, systems, and equipment
- Knowledge of pump theory and characteristics, including types of cargo pumps and their safe operation
- Knowledge of the effect of bulk liquid cargoes on trim and stability and structural integrity
- Proficiency to apply tanker safety culture and implementation of safety management requirements
- Proficiency to apply safe preparations, procedures and checklist for all cargo operations
- Proficiency to perform cargo measurement and calculation
- Proficiency to manage and supervise personnel with cargo-related responsibilities
- Knowledge and understanding of basic chemistry and physics and the relevant definitions related to the safe carriage of liquefied gases in bulk in ships
- Understanding the information contained in a Material Safety Data Sheet (MSDS)
- Knowledge and understanding of the hazards and control measures associated with liquefied gas tanker cargo operations
- Proficiency to calibrate and use monitoring and gas detection systems, instruments and equipment
- Knowledge and understanding of dangers of non-compliance with relevant rules/regulation
- Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety relevant to liquefied gas tankers
- Knowledge and understanding of liquefied gas tanker emergency procedures
- Actions to be taken following collision, grounding or spillage and envelopment of the ship in toxic or flammable vapour
- Knowledge and understanding of relevant provisions of the International Convention for the Prevention of Pollution from Ships (MARPOL) and other relevant IMO instruments, industry guidelines and port regulations as commonly applied
- Proficiency in the use of the IBC and IGC Codes and related documents

### Specific objectives:

- \* Familiarization with the equipment, instrumentation and controls used for cargo handling on a liquefied gas tanker
- \* A greater awareness of the need of proper planning, the use of checklists and the time scales involved in the various cargo handling Operations.
- \* An enhanced awareness to apply proper and safe procedures at all times when carrying out the various Operations on board liquefied gas tanker
- \* An acquisition of experience in identifying operational problems and assist in solving them
- \* An improvement in the ability to promote safety and protect the marine environment
- \* An increased ability to assist and coordinate actions during emergencies

**Full-or-part-time:** 32h 45m

Theory classes: 14h 52m

Practical classes: 3h

Self study : 14h 53m

## ACTIVITIES

### TRAINING ON SIMULATOR

**Description:**

- Basic knowledge of ship arrangements of an oil tanker an chemical tanker
- Knowledge of the effect of bulk liquid cargoes on trim, stability and structural integrity
- Profeciency to apply safe preparations, procedures and checklists for all cargo operations

**Specific objectives:**

acquire knowledge of ship arrangements of an oil tanker an chemical tanker, knowledge of the effect of bulk liquid cargoes on trim, stability and structural integrity and profeciency to apply safe preparations, procedures and checklists for all cargo operations

**Material:**

SIMULATOR

**Full-or-part-time:** 10h

Laboratory classes: 10h

## GRADING SYSTEM

CONTRIBUTION OF WORKS AND SIMULATOR 25%

EXAM BY BLOCK OR FINAL EXAM 75%

RE-EVALUATION IS AN EXAM

## BIBLIOGRAPHY

**Basic:**

- LNG : operational practice. 2nd ed. London: Witherbys, 2020. ISBN 9781856098717.
- Organització Internacional Marítima. SOLAS : edición refundida de 2020 : texto refundido del Convenio internacional para la seguridad de la vida humana en el mar, 1974, y su protocolo de 1988 : artículos, anexos y certificados. Londres: IMO, 2020. ISBN 9789280131253.
- Convenio Marpol : artículos, protocolos, anexos e interpretaciones unificadas del Convenio internacional para prevenir la contaminación por los buques, 1973, modificado por el Protocolo de 1978 y 1997. Ed. refundida de 2011. Londres: Organización Marítima Internacional, 2011. ISBN 9789280131031.
- Organització Internacional Marítima. Código IMDG : código marítimo internacional de mercancías peligrosas. Londres: IMO, 2021. ISBN 9789280131734.
- BCH CODE : Code for the construction and equipment of ships carrying dangerous chemicals in bulk. 9th ed. London: International Maritime Organization, 2009. ISBN 9789280115093.
- Organització Internacional Marítima. Código internacional para la construcción y el equipo de buques que transporten productos químicos peligrosos a granel : código CIQ. Londres: International Maritime Organization, 2007. ISBN 9789280101461.
- Organització Internacional Marítima. Advanced training for liquefied gas tanker cargo operations. Imo Model Course, 1.05. London: IMO, 2015. ISBN 9789280116212.
- Organització Internacional Marítima. Advanced Training for oil tanker cargo operations. Imo Model Course 1.02. London: International Maritime Organization, 2015. ISBN 9789280116205.
- Organització Internacional Marítima. Advanced training for chemical tanker cargo operations. Imo Model Course 1.03. London: IMO, 2016. ISBN 9789280116472.

**Complementary:**

- LNG shipping knowledge : underpinning knowledge to the SIGTTO standards. 2nd edition. Livingston: Witherby Seamanship International, [2011]. ISBN 9781856095044.
- McGuire, Graham; White, Barry. Liquefied gas handling principles : on ships and in terminals. 3rd ed. London: Witherby : SIGTTO, 2000. ISBN 1856091643.
- International Chamber of Shipping. International safety guide for oil tankers and terminals (ISGOTT). 6th ed. London: Witherby, 2020. ISBN 9781856099189.
- Solly, Ray. The development of crude oil tankers : a historical miscellany [on line]. Yorkshire, Philadelphia: Pen & Sword Transport,

an imprint of Pen & Sword Books Ltd, 2021 [Consultation: 05/12/2023]. Available on:  
<https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=6996042>. ISBN 9781526792440.

## RESOURCES

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### Other resources:

The agreements (SOLAS, MARPOL ...) and the updated IMO regulations can be consulted through the IMO VEGA database on the web. To access it, you must request the access codes from the library of the Barcelona Nautical Faculty.

International Maritime Organization. IMO-Vega on the web [online]. London: IMO, 2010- [Accessed: 14 July 2021]. Available at:  
<<https://vp.imo.org/Login.aspx>> [Access restricted to UPC users, go to the library loan desk]