



Teaching Guide

Teaching Guide				
Identifying Data				2022/23
Subject (*)	Management Control Ship Cargo Operations		Code	631510207
Study programme	Mestrado Universitario en Náutica e Transporte Marítimo			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	2nd four-month period	First	Obligatory	6
Language	SpanishEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Navegación e Enxeñaría Mariña			
Coordinador	Prieto Cabo, Verónica	E-mail	v.prietoc@udc.es	
Lecturers	Prieto Cabo, Verónica	E-mail	v.prietoc@udc.es	
Web				
General description	Capacitar aos alumnos en todo o relacionado coa xestión, planificación, control e transporte de cargas líquidas, cargas sólidas a granel e transporte de mercadorías perigosas			

Study programme competences / results

Code	Study programme competences / results
A12	Capacidade para planificar e garantir o embarco, estiba e suxección da carga, e o seu coidado durante a viaxe e o desembarco.
A13	Capacidade para a avaliación das avarías e defectos notificados, nos espazos de carga, as tapas de escotilla e os tanques de lastre, e adoptar as medidas oportunas.
A14	Capacidade para o transporte de mercadorías perigosas.
A15	Capacidade para controlar o asentado, a estabilidade e os esforzos.
A20	Capacidade para organizar e administrar a atención médica a bordo.
B2	Capacidade para resolver problemas de forma efectiva.
B5	Capacidade para traballar de forma efectiva nunha contorna de traballo.
B11	Capacidade para organizar, planificar e resolver problemas relativos ao departamento de navegación
B12	CB6 -Posuír e comprender coñecementos que aporten unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, a miúdo nun contexto de investigación
B13	CB7-Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornas novas ou pouco coñecidas dentro de contextos máis amplas (ou multidisciplinares) relacionados coa súa área de estudo
C2	Capacidade para dominar a expresión e a comprensión de forma oral e escrita nun idioma estranxeiro
C6	Capacidade para valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C10	C10-Capacidade para aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornas novas ou pouco coñecidas dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo

Learning outcomes

Learning outcomes	Study programme competences / results		
Planning and control of preparation of cargo spaces, loading and unloading operations, stowage and transport of solid cargoes in bulk	AJ12	BC2	CC2
	AJ13	BC11	CC6
	AJ14	BC12	CC10
	AJ15		
	AJ20		



Planning and control of loading and unloading operations, inerting, water washig and crude oil washing of cargo tanks and discharge of oily residues.	AJ12 AJ13 AJ14 AJ15	BC2 BC5 BC11 BC13	CC6
To know the properties and dangers of dangerous goods (IMDG Code) and actions to take in case of an emergency	AJ12 AJ13 AJ14 AJ15 AJ20	BC2 BC5 BC11 BC13	CC6
Capacity to detect damages in the cargo spaces, ballast tanks, hatches and other structural damages and to do damage reports.	AJ12 AJ13 AJ14 AJ15	BC2 BC5 BC11 BC13	CC6
Capacity to do and design cargo lashing plans in order to avoid damages and/or accidents	AJ12 AJ13 AJ14 AJ15	BC2 BC5 BC11 BC13	CC6
Apply the international Conventions in force, Codes, resolutions and other international guides to carry out all the operations, related with the cargo, in a safe way	AJ12 AJ13 AJ14 AJ15	BC2 BC5 BC11 BC13	CC6
A thorough knowledge* of the use and contents of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods.	AJ20		

Contents	
Topic	Sub-topic
Chap. 1. LIQUID HYDROCARBONS AND CHEMICAL PRODUCTS CARGO MEASUREMENT	Definitions Calculations on board: American System, metric System and imperial or British System Process of the measurement of the cargo on a oil tanker Methods of taking ullages or soundings Measurement equipment: manual equipment, electronic equipment (PEGD), automatic equipment. High-level alarms and overflow systems Methods of calculation of the quantity on board (OBQ) and remain on board edge (ROB): Liquid Material, Non-liquid material Wedge formulae Sounding and sampling in non-inerted tanks Cargo Calculation in chemical tankers



Chap. 2. LIQUEFIED GASES CARGO CALCULATION	<p>Cargo calculations: introduction</p> <p>Definitions and concepts: Ideal gas laws, Saturated Vapour Pressure, Physical properties of gas mixtures, Vapour pressure of gas mixtures, Temperature, Pressure, Heat</p> <p>Measurement of cargo tank volumes. Measurement of densities.</p> <p>Empirical calculation of the density of liquefied gas mixtures at a given temperature</p> <p>Cargo Tank filling limits</p> <p>Calculation procedures: Using standard temperature at 15°C and using density tables</p> <p>Determination of liquid LPG required for gassing up operations.</p> <p>Determination of the Saturated Vapour Pressure of a mixture of gases at a given temperature.</p> <p>Determination of atmosphere changes of a cargo tank and the required nitrogen or inert gas volume.</p> <p>Properties of a LPG in saturated conditions</p>
Chap. 3, DANGEROUS GOODS	<p>The IMDG Code</p> <p>Structure of the Dangerous Goods List</p> <p>Classification of Dangerous Goods: Class 1 to Class 9.</p> <p>Identification of dangerous goods</p> <p>Packing</p> <p>Marking and placarding</p> <p>Documentation</p> <p>Stowage</p> <p>Segregation</p>



Chap. 4. OIL TANKER OPERATIONS	<ul style="list-style-type: none">Types of crude oilsCrude oil propertiesFlammability classification of petroleumTank washing planTank washing machinesTank washing with waterBallasting and deballasting cargo tanksSlop tank operationsPurging and gas freeingRaftingPumproom operationsWashing of cargo lines and pumpsMaintenance in cargo tanks and cargo tank deck areasVoyage orders and cargo instructionsLoading PlanThe loading operationLoading static accumulators oilsLoad On TopMaximum loading rateCargo tank venting during loadingVoc management plan and control technologyThe loaded passageThe Discharge planWhat is COW?COW methodsCOW supply methodsPrecautions when implementing the COW PlanDischarge operationsStripping systemsContingencies and emergencies
Chap. 5. STOWAGE AND PLANNING OF SOLID BULK CARGOES TRANSPORT	<ul style="list-style-type: none">Solid bulk cargoes transport regulationsIMSBC CodeCargoes which may liquefyMaterials possessing chemical hazardsTrimming proceduresCleaning and preparation of cargo holdsProcedures before arrival to the loading portOperations at the loading portOperations at the discharge portShip-shore safety checklistsPotential problems during cargo operationsCargo distributionAdditional measures for bulk carriersStructural limitations to consider when preparing a loading plan in a bulk carrierStowage planification of heavy density cargoes as iron ore or mineral concentratesCargo calculationSegregation of different products in the same holdFumigation of ships and their cargoThe Silver Nitrate test



Chap. 6. CARGO CALCULATIONS	<p>Resolution of cargo exercises related with the programme: Cargo calculations in oil, chemical and LPG tankers; Cargo calculations in bulk carriers and combination carriers.</p> <p>Stowage and securing of cargo on board as required by the CSS Code.</p>
	<p>Knowledge of and ability to apply relevant international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargoes</p> <p>Knowledge of the effect on trim and stability of cargoes and cargo operations Use of stability and trim diagrams and stress-calculating equipment, including automatic data-based (ADB) equipment, and knowledge of loading cargoes and ballasting in order to keep hull stress within acceptable limits</p> <p>Stowage and securing of cargoes on board ships, including cargo-handling gear and securing and lashing equipment</p> <p>Loading and unloading operations, with special regard to the transport of cargoes identified in the Code of Safe Practice for Cargo Stowage and Securing</p> <p>General knowledge of tankers and tanker operations</p> <p>Knowledge of the operational and design limitations of bulk carriers Ability to use all available shipboard data related to loading, care and unloading of bulk cargoes.</p> <p>Ability to establish procedures for safe cargo handling in accordance with the provisions of the relevant instruments such as IMDG Code, IMSBC Code, MARPOL 73/78 Annexes III and V and other relevant information</p> <p>Ability to explain the basic principles for establishing effective communications and improving working relationship between ship and terminal personnel.</p> <p>Knowledge of the limitations on strength of the vital constructional parts of a standard bulk carrier and ability to interpret given figures for bending moments and shear forces</p> <p>Ability to explain how to avoid the detrimental effects on bulk carriers of corrosion, fatigue and inadequate cargo handling.</p> <p>International regulations, standards, codes and recommendations on the carriage of dangerous cargoes, including the International Maritime Dangerous Goods (IMDG) Code and the International Maritime Solid Bulk Cargoes (IMSBC) Code</p> <p>Carriage of dangerous, hazardous and harmful cargoes; precautions during loading and unloading and care during the voyage.</p> <p>A thorough knowledge of the use and contents of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods.</p>
	<p>Conocimiento cabal del contenido y de la manera de utilizar la guía de primeros auxilios para uso en caso de accidentes relacionados con mercancías peligrosas</p>



Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Introductory activities	B11	1	0	1
Guest lecture / keynote speech	A12 A13 A14 A15 A20 B2	25	37.5	62.5
Case study	A12 A13 A14 A15 B2 B5 B11 B13 C6	25	37.5	62.5
Objective test	A12 A13 A14 A15 A20 B2	6	6	12
Summary	B12 C2 C10	6	0	6
Personalized attention		6	0	6

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

Methodologies	
Methodologies	Description
Introductory activities	The first class will be dedicated to the presentation of the subject to the students.
Guest lecture / keynote speech	General lectures of the different chapters the subject will be given. The student will have at his disposition bibliographic material and notes elaborated by the professor of the different themes of the subjects for every lecture. The participation of the students will be promoted through comments related to the theoretical content and with experiences of the real life.
Case study	Application of the theory learnt in the lectures and resolution of practical exercises.
Objective test	The objective test will consist in a series of conceptual short questions, whose number will vary between 10 and 20, and the resolution of two practical exercises. The content of the questions will be similar to those given in the lectures and the practical exercises will be also similar to those resolved in the classroom. The student will have at his disposal sufficient material for the study of the theory and for the practical exercises. It may be possible to do partial tests of the theoretical part and of the practical exercises, and finally a joint final test of the complete subject.
Summary	Before each partial test and also before the final examination a general resumed lecture of the main contents exposed will be given. The intention is to help the student to understand the subject in a global way and to resolve those aspects that could give place to confusion or that were not assimilated properly.

Personalized attention	
Methodologies	Description
Summary Case study	Further to the tutorship hours established for all the students of the subject, 6 additional hours of customized tutorship are established to support and motivate those students that will require it.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Guest lecture / keynote speech	A12 A13 A14 A15 A20 B2	The students will have the option to approve the subject during the term course providing always that he assisted to a least an 80% of the lectures in the classroom. The assistance to the lectures and the participation of the student, the resolution of the practical exercises and the continuous evaluation of the Professor may increase the final qualification with a 10%. Competencies: A12, A13, A14 and A15	5



Objective test	A12 A13 A14 A15 A20 B2	The final qualification will be the average of the qualifications achieved in the partial tests and/or the final test. To surpass the subject is will necessary to obtain a 50% of weight in each part of the evaluation (Theoretical part (50%)and resolution of the practical exercises (50%). Competencies: A12, A13, A14, A15 & A20.	90
Case study	A12 A13 A14 A15 B2 B5 B11 B13 C6	The resolution of the practical exercises in the classroom may increase the final qualification with an additional 10%. Competencies A12,A13, A14 and A15.	5
Others			

Assessment comments

Same criteria will be applied in the first and second opportunity (May and July)

Assessment criteria as included in the STCW Code Table A-II/2 and included in the Quality Guarantee System, to be applied when evaluating competence.

The students

with recognition of part-time dedication and academic waiver of attendance

exemption, as established by the "NORM THAT REGULATES THE REGIME OF

DEDICATION TO STUDY OF GRADE STUDENTS IN THE UDC (Arts. 2.3; 3.b; 4.3 and 7.5)

(Arts. 2.3; 3.b; 4.3 and 7.5) 05/04/2017) will be able to carry out the partial

tests, if necessary, without the need to attend 80% of the face-to-face

classes, as long as the professors are duly informed at the beginning of the

course. Furthermore, the professor may ask those students different research

works/problems along the school year to be expounded during tutoring hours.

Sources of information



Basic	<p>Notes from the Professor ?Management & Control of Ship Cargo Operations, 2014?Estiba de Cargas Sólidas, F. Louzán. Cartamar, A Coruña, 2016. Manual de buques petroleros. F. Louzán, Cartamar, A Coruña, 2020 Código internacional para la construcción y el equipo de buques que transportes gases licuados a granel. OMI. (IGC Code) Código IMDG, IMO 2016. (IMDG Code) Código IMSBC, IMO 2013. (IMSBC Code) Código de prácticas de seguridad para la estiba y sujeción de la carga. IMO 2011. (CSS Code 2011) Código BLU: Código de prácticas de seguridad de las operaciones de carga y descarga de graneleros. IMO 2011. (BLU Code 2011) Código internacional para el transporte sin riesgo de grano a granel. IMO 1991. (Grain Code) Código de prácticas de seguridad para buques que transporten cubiertas de madera, IMO 1992. (Timber Deck Cargoes Code, 1992) Código de prácticas de seguridad para buques que transporten cubiertas de madera, IMO 2011. (Timber Deck Cargoes Code, 2011) Manual de estiba de mercancías sólidas. Ricardo González Blanco, Ediciones UPC 2006 Tratado de estiba. Capt. J.B.Costa, Tercera edición, 2008. Cargo work. David J. House, Seventh edition, 2007. Thomas Stowage: The properties and stowage of cargoes, 5th edition. Brown, Son & Ferguson, Ltd. 2008. Tanker operations: A handbook for the Person-in-Charge, 4th edition. Mark Huber, Cornell Maritime Press, 2001. Liquefied gas handling principles on ships and in terminals, 3rd edition, McGuire and White, Witherby & Co Ltd. 2000. Bulk Carrier Practice, 2nd edition. Captain Jack Isbester. The Nautical Institute, London 2010. Bulk Carrier Notes. Abdul Khaliq. Witherby Seamanship International, 2010. Cargo Notes. Dhananjay Swadi. Witherby Seamanship International, 2005. EL Bulk-carrier en la práctica. José Antonio Bustabad Rey. Urmo S.A. de Ediciones, Bilbao, 1980. Crude Oil Tanker Basics: The theory and practice of crude oil cargo operations. Captain Paul Armitage. Witherby Seamanship International, 2009. Stability, Trim and Strength for Merchant Ships and Fishing Vessels, second edition. Ian Clark. The Nautical Institute, 2006. Shipboard Petroleum Surveys: A Guide to Good Practice, second edition. Anthony Severn, North of England P&I Association, London 2009. Liquefied Petroleum Gas Tanker Practice. Captain T.W.V. Woolcott. Brown, Son & Ferguson, Ltd., Glasgow 1977. Quantity Calculations LPG and Chemical Gases. D Beernaert, SIGTTO (The Society of International Gas Tanker and Terminal Operators) 1997. A Guide to Crude Oil Washing and Cargo Heating Criteria. INTERTANKO 2004. ISGOTT, International Safety Guide for Oil Tanker and Terminals, fifth edition. ICS, OCIMF & IAPH, Witherby & Co. Ltd., London 2006. Tanker Safety Guide: Liquefied Gas, second edition. International Chamber of Shipping, London 1995</p>
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

(*)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.