Teaching Guide				
Identifying Data				2023/24
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	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Navegación e Enxeñaría Mariña			
Coordinador	Prieto Cabo, Verónica	E-mail	v.prietoc@udc.es	
Lecturers	Pacheco Martínez, Eliseo Antonio Prieto Cabo, Verónica Salgado Don, Alsira	E-mail	eliseo.pacheco@udc.es v.prietoc@udc.es alsira.salgado@udc.es	
Web				
General description	To train students in all aspects of management, planning, control and transport of liquid cargoes, solid bulk cargoes and transport of dangerous goods.			

Study programme competences	
Code	Study programme competences
A12	Capacidade para planificar e garantir o embarco, estiba e suxeción 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 asento, 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 originais 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		
Planning and control of preparation of cargo spaces, loading and unloading operations, stowage and transport of solid cargos in bulk	AJ12 AJ13 AJ14 AJ15 AJ20	BC2 BC11 BC12	CC2 CC6 CC10

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. LIQUEFIED GASES CARGO CALCULATION	Cargo calculations: introduction Definitions and concepts: Ideal gas laws, Saturated Vapour Pressure, Physical properties of gas mixtures, Vapour pressure of gas mixtures, Temperature, Presssure, Heat Measurement of cargo tank volumes. Measurement of densities. Empirical calculation of the density of liquefied gas mixtures at a given temperature Cargo Tank filling limits Calculation procedures: Using standard temperature at 15ºC and using density tables Determination of liquid LPG required for gassing up operations. Determination of the Saturated Vapour Pressure of a mixture of gases at a given temperature. Determination of atmosphere changes of a cargo tank and the rquired nitrogen or inert gas volume. Properties of a LPG in saturated conditions

Chap. 2. STOWAGE AND PLANNING OF SOLID BULK CARGOES TRANSPORT	Solid bulk cargoes transport regulations IMSBC Code Cargoes which may liquefy Materials possessing chemical hazards Trimming procedures Cleaning and preparation of cargo holds Procedures beforre arrival to the loading port Operations at the loading port Operations at the discharge port Ship-shore safety checklists Potential problems during cargo operations Cargo distribution Additional measures for bulk carriers Structural limitations to consider when preparing a loading plan in a bulk carrier Stowage planification of heavy density cargoes as iron ore or mineral concentrates Cargo calculation Segregation of different products in the same hold Fumigation of ships and their cargo The Silver Nitrate test
Chap. 3.DANGEROUS GOODS	The IMDG Code Structure of the Dangerous Goods List Clasification of Dangerous Goods: Class 1 to Class 9. Identification of dangerous goods Packing Marking and placarding Documentation Stowage Segregation

Chap. 4. OIL TANKER OPERATIONS	Types of crude oils Crude oil properties Flammability classification of petroleum Tank washing plan Tank washing machines Tank washing with water Ballasting and deballasting cargo tanks Slop tank operations Purging and gas freeing Rafting Pumproom operations Washing of cargo lines and pumps Maintenance in cargo tanks and cargo tank deck areas Voyage orders and cargo instructions Loading Plan The loading operation Loading static accumulators oils Load On Top Maximum loading rate Cargo tank venting during loading Voc management plan and control technology The loaded passage The Discharge plan What is COW? COW methods COW supply methods Precautions when implementing the COW Plan Discharge operations Stripping systems Contingencies and emergencies
Chap. 5. 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. 6. CARGO CALCULATIONS	Resolution of cargo exercises related with the programme: Cargo calculations in oil, chemical and LPG tankers; Cargo calculations in bulk carriers and combination carriers. Stowage a securing of cargo on board as required by the CSS Code.

	Knowledge of and ability to apply relevant international regulations, codes and standards concerning the safe handling, stowage, securing and transport of cargoes 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 keephull stress within acceptable limits Stowage and securing of cargoes on board ships, including cargo-handling gear and securing and lashing equipment Loading and unloading operations, with special regard to the transport of cargoes identified in the Code of Safe Practice for Cargo Stowage and Securing General knowledge of tankers and tanker operations 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. 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 Ability to explain the basic principles for establishing effective communications and improving working relationship between ship and terminal personnel. 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 Ability to explain how to avoid the detrimental effects on bulk carriers of corrosion, fatigue and inadequate cargo handling. 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 Carriage of dangerous, hazardous and harmful cargoes; precautions during loading and unloading and care during the voyage. A thorough knowledge of the use and contents of the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods.
	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

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Introductory activities	B11	1	0	1

Guest lecture / keynote speech	A12 A13 A14 A15 A20 B2	30	45	75
Case study	A12 A13 A14 A15 B2 B5 B11 B12 B13 C2 C6 C10	26	39	65
Mixed objective/subjective test	A12 A13 A14 A15 A20 B2	6	0	6
Personalized attention		3	0	3
(*)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 differents themes of the subjets 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.
Mixed objective/subjective test	Test that integrates essay-type questions and objective-type questions. The former comprises open-ended essay questions; the latter may combine multiple-choice, ranking, short-answer, discrimination, completion and/or association questions. they may also include the resolution of practical exercises. The content of the questions will be related to the subjects taught in class and the practical exercises will also be similar to those solved in class. Students will be provided with sufficient material for the study of the theory and for the practical exercises. There may be partial tests, both of the theoretical part and of the problem solving, and a final joint test of the whole subject.

Personalized attention	
Methodologies	**Description**
Case study	Face-to-face. In addition to the hours of tutorials established for all students of the subject, 3 hours are established for students with needs. Teams. It will depend on the availability of the teachers Email. The teachers are committed to respond as soon as possible to all the doubts sent. As for the "Students with recognition of part-time dedication and academic dispensation of exemption from attendance" the teachers may offer the possibility of online tutorials. Teacher and student will coordinate this assistance.

Assessment			
Methodologies	**Competencies**	**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 increse the final qualification with a 10%. Competencies: A12, A13, A14 and A15	5
Mixed objective/subjective 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 B12 B13 C2 C6 C10	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

The evaluation criteria contemplated in table A-II/2 of the STCW Code, and included in the Quality Assurance System, will be taken into account when designing and carrying out the evaluation.

In order to pass the subject through continuous assessment, the average of the partial mixed tests carried out during the course will be taken, provided that a minimum of 4 out of 10 has been obtained in each of them. In addition, the grade corresponding to the rest of the methodologies will be added. On the other hand, a minimum attendance of 80% will be required to be eligible for continuous assessment.

For those students who follow the continuous assessment, the partial mixed tests passed during the continuous assessment will be kept in the June exams, being able to sit only those parts of the subject that are pending. However, in the July exam session, there will be a single exam of the whole subject with a grade of 100% of the final mark.

The submission and presentation of assignments, cases and problems will be done preferably using the virtual faculty on the dates established.

The studentswith recognition of part-time dedication and academic waiver of attendanceexemption, as established by the "NORM THAT REGULATES THE REGIME OFDEDICATION 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 partialtests, if necessary, without the need to attend 80% of the face-to-faceclasses, as long as the professors are duly informed at the beginning of thecourse. Furthermore, the professor may ask those students different researchworks/problems along the school year to be expounded during tutoring hours.

The fraudulent performance of assessment tests or activities, once verified, will directly imply the loss of the right to the opportunity in which the fault was committed and respect for the subject in which it was committed. The student will be graded with a "fail" (numerical grade 0) in the corresponding call of the academic year, whether the offence is committed on the first or second opportunity. To this end, the grade will be modified in the first opportunity report, if necessary.

In the case of students with academic dispensation, 10% of the attendance will be distributed proportionally among the rest of the criteria. Students who do not take part in the continuous assessment will be assessed in a face-to-face test with a value of 100%.

Sources of information

Basic	Apuntes del profesor ?Management & Control of Cargo Operations, 2020?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. Código IMDG, IMO 2020. Código IMSBC, IMO 2020. Código de prácticas de seguridad para la estiba y sujeción de la carga. IMO 2011. Código BLU: Código de prácticas de seguridad de las operaciones de carga y descarga de graneleros. IMO 2011. Código internacional para el transporte sin riesgo de grano a granel. IMO 1991. Código de prácticas de seguridad para buques que transporten cubertadas de madera, IMO 1992. Código de prácticas de seguridad para buques que transporten cubertadas de madera, IMO 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, 8th edition. Brown, Son & Ferguson, Ltd. 2018. 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 Khalique. 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. Liquified 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
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.