Teaching Guide				
Identifying Data				2021/22
Subject (*)	Cargo Stowage		Code	631G01301
Study programme	Grao en Náutica e Transporte Marítimo			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Third	Obligatory	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Navegación e Enxeñaría Mariña			
Coordinador	Pérez Canosa, José Manuel	E-mail	jose.pcanosa@udc.es	
Lecturers	Louzan Lago, Felipe Pérez Canosa, José Manuel	E-mail	felipe.louzan@udc.es jose.pcanosa@udc.es	
Web				
General description	To train students in the aspects related to the operations of loading, unloading and safe transport of the different types of goods of general cargo and solid bulk cargoes on ships.			

Contingency plan	1. Modifications to the contents No changes will be made. 2. Methodologies *Teaching methodologies that are maintained - Master session - Laboratory practices in medium and small groups (problems, exercises and / or supervised work) - Personalized attention *Teaching methodologies that are modified -All the previously mentioned methodologies will be carried out electronically (Teams) with the support of Moodle for the delivery of the problems, exercises and supervised works. 3. Mechanisms for personalized attention to students -Email: Daily. Of use to make consultations, to request virtual meetings, to solve doubts and to follow up the supervised exercises. - Moodle: Through forums. - Teams: Sessions in large group and medium and small groups for the advance of the theoretical-practical contents in the time slot that has assigned the subject in the official calendar of the School. 4. Modifications in the evaluation The continuous assessment (pre-final) will be done electronically and without any restrictions, ie without the need to have attended a minimum of 80% of the classes that take place in this way (Teams). The face-to-face sessions will alternate between master classes and more interactive sessions, in which the active participation of students will be positively assessed in the continuous assessment (up to 20%), especially in the sessions where the problems are developed and solved. Given the foreseeable unequal participation of students in the follow-up of the subject, it is necessary to establish the official exams of the 1st and 2nd call so that it allows all students to be evaluated in equal conditions to pass the subject. Therefore, the evaluation of the 1ª and 2ª opportunity will be done electronically, with two clearly differentiated parts, theory and problems, and with an assessment that will range from 0-100%. The theoretical part will be evaluated by a test-type exam by Moodle. *Evaluation observations: The minimum calification required to make an arithmetic mean between the two parts (theory and problems) is modified, going from 5.0 points to 4.0 points in one of the parts. In any case, the average grade must be at least 5.0 points. Students must keep and guard the handwritten exams in their possession. The teacher will maintain connection with the students via Teams during the exam to clarify any doubts, and also has the possibility to ask or request the connection of the student's camera at any time. 5. Modifications to the bibliography or webgraphy No changes will be made.

Study programme competences	
Code	Study programme competences
A22	Cargar, manipular e estibar do xeito axeitado as diferentes mercadorías transportables nun buque.
A23	Asegurar o cumprimento das prescricións sobre prevención da contaminación.
A32	Controlar o asento, a estabilidade e os esforzos.
A33	Protexer o medio mariño e aplicar criterios de sostibilidade ambiental ao transporte marítimo.

B1	Aprender a aprender.
B2	Resolver problemas de xeito efectivo.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Comunicarse de xeito efectivo nun ámbito de traballo.
B5	Traballar de forma autónoma con iniciativa.
B6	Traballar de forma colaboradora.
B9	Capacidade para interpretar, seleccionar e valorar conceptos adquiridos noutras disciplinas do ámbito marítimo, mediante fundamentos físico-matemáticos.
B10	Versatilidade.
B11	Capacidade de adaptación a novas situacións.
B12	Uso das novas tecnoloxías TIC, e de Internet como medio de comunicación e como fonte de información.
B13	Comunicar por escrito e oralmente os coñecementos procedentes da linguaxe científica.
B15	Capacidade para adquirir e aplicar coñecementos.
B16	Organizar, planificar e resolver problemas.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes			
Learning outcomes	Study programme competences		
Knowledge of safe handling, stowage and securing procedures for cargo and preparation of stowage plans.	A22 A23 A33	B1 B2 B3 B4 B5 B6 B9 B10 B11 B12 B13 B15 B16	C3 C6
Knowledge of the equipment and tools for cargoes handling.	A22 A32	B2 B6 B9	
Knowledge of general cargo and bulk cargo ships.	A22 A23 A32 A33	B1 B2 B3 B16	C6
Apply the principles of cargo holds' meteorology and ventilation.	A22 A33	B2 B6 B15	C6 C8
Knowing the characteristics of goods, standard cargo and dangerous goods	A22 A23 A33	B2 B9 B15 B16	

Calculation of cargo to be loaded and ship's drafts.	A22 A32	B2 B6	

Contents	
Topic	**Sub-topic**
TOPIC 1. Gear and means of loading and unloading	Motones. Pastecas. Aparellos. Puntales de carga. Plumas. Grúas. Maniobras con puntales. Esfuerzos sobre os puntales, roldanas. Cables de acero, Características dos cables de cordones. Coidados e mantenimiento dos cables. Selección dun cable. Confección de gazas. Mantenemento de plumas e puntales. Portas laterales. Conocemiento dos efectos da carga, incluidas as cargas pesadas, na navegabilidade e estabilidade do buque.
TOPIC 2. Hatch covers	Tapas de escotillas: funcións e características. Tipos de escotillas metálicas. Estanqueidad das escotillas. Probas de estanqueidade das escotillas. Inspeccións e mantenemento das tapas de escotillas, Problemas e defectos comúns das escotillas. Listas de comprobación.
TOPIC 3. Practice of general cargo stowage	Estiba, Obxetivos dunha boa estiba. Bodegas. factor de estiba. Soleras. Utillaxe de estiba. Envases y embalajes. Carga general. O buque de carga xeral. O carguero polivalente. Averías e riscos das bodegas. Preparación das bodegas. Lavado de bodegas. Preparación dos pozos de sentinas. Planos de estiba.
TOPIC 4. Cargo hold meteorology	A temperatura da carga durante a viaxe. Mercancías higroscópicas/non higroscópicas. A condensación: sudor do casco/sudor de la carga. Reglas para evitar os danos por condensación. Ventiladores de bodegas. Deshumidificadores de bodegas. Ventilación considerando os tipos de mercancías. Sistemas de ventilación de bodegas. Tablas de humidade absoluta y punto de rocío.
TOPIC 5. Typical cargoes	Cargamentos de balas. estiba de carga ensacada. Transporte de arroz, caco en grano, azúcar, fariña de pescado. Estiba de recipientes intermedios flexibles para graneles. Carga paletizada. Estiba de bloques de granito. Estiba de cristal en follas. Estiba de caxerío. Carga de productos de aceiro: bobinas, tochos, palanquilla, planchas, aceiro para estructuras, barras de acero e varilla en atados, tuberías e rollos de alambre. Obligaciones do oficial de guardia durante a carga e descarga. Carga de chatarra a granel. Precaucións que deben tomarse para evitar a contaminación do medio mariño.
TOPIC 6. Bulk carriers	Buques graneleiros. Clasificación. Tipos de buques graneleiros. Configuración da estructura dun bulk carrier. A seguridade dos bulk carriers: Capítulo XII del SOLAS. Reglas unificadas da IACS para graneleiros. Distribución da carga. Medidas adicionais para bulk carriers. Problemas potenciales durante as operaciones de carga e descarga. Planificación e control das operacións de carga e descarga.
TOPIC 7. Stowage and transport planning of solid cargoes in bulk	Regulación de transporte de cargas a granel. Código IMSBC. Cargas que poden licuarse. Materias que entrañan riscos de naturaleza química. Enrasado de cargas a granel. Limpeza de bodegas. Operacións no porto de carga/descarga. Listas de comprobación de seguridad buque-terra. Precaucións a observar antes do embarque. Problemas potenciais durante as operacións de carga/descarga. Distribución da carga. Limitaciones estructurais ao preparar un plan de carga en un B/C. Cálculo da carga embarcada. Prueba de nitrato de plata.
TOPIC 8. Shipments of solid bulk cargos	Abonos. Alúmina. Azufre. Bauxita. Cemento. Carbón. Espato flúor. Ferro obtido por reducción directa. Fariña de pescado. Torta de semillas. Concentrados de minerales. Coque de petróleo. Minerales pesados. Piritas calcinadas. Sal.

TOPIC 9. Stowage calculations	Uso de tablas hidrostáticas de diferentes tipos de buques de carga e graneleiros. Determinación da carga a embarcar. Cálculo de calados. Estiba e trimming da carga para deixar o buque en calados. Restrición de calados por época e zona. Determinación de la carga embarcada mediante survey de calados. Puntos indiferentes. Toneladas en cabeza. Diagramas de asientos. Cálculos de aparellos e puntales
The development and passing of these contents, together with those corresponding to other subjects that include the acquisition of specific competencies of the degree, guarantee the knowledge, understanding and sufficiency of the competencies listed in table AII / 2, of the STCW Convention, related to the management level of First Officer of Merchant Ships, without limitation of gross tonnage and Captain of Merchant Ships up to a maximum of 3000 GT.	Table A-II / 2 of the STCW Convention. Specification of the minimum competition rules applicable to captains and first officers of gross tonnage vessels equal to or greater than 500 GT.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A22 A23 A32 A33 B1 B2 B3 B4 B5 B6 B9 B11 B15 B16 C3 C6 C8	30	32	62
Objective test	A22 A23 A32 A33 B2 B13	4	0	4
Laboratory practice	A22 A32 B10 B12	30	48	78
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
Guest lecture / keynote speech	Presentation of each one of the topics with the support of ICTs, when deemed necessary, also providing students with some notes with the entire syllabus. As a complement to the theoretical classes, different problems of loading and stowage calculations are exposed in different ship models.
Objective test	The objective test will consist of a series of questions, between 10 and 20, of conceptual development on the subjects taught in class and on which the student will be provided with sufficient material to pass. The resolution of one to three stowage problems of the same type as those solved in class will also be included in the test.
Laboratory practice	Resolution of different stowage calculations with different types of ships. Students must solve the problems proposed by the teacher in order to apply the theoretical knowledge in a practical way and / or through load simulation software.

Personalized attention	
Methodologies	Description
Laboratory practice Guest lecture / keynote speech	During the entire first semester that compulsory teaching is taught and in addition to the tutoring schedule, the week before the exam the professor will attend to any queries outside the tutoring hours on the subject matter or the resolution of stowage problems.

Assessment			
Methodologies	Competencies	Description	Qualification

Laboratory practice	A22 A32 B10 B12	The final objective test will consist of solving two stowage calculations (with different types of ships) and struts, similar to those solved in class. It will be compulsory for students who do not pass the problem-solving assessment by course, if they were done. Resolution and participation in practical exercises in class can be valued up to 10%. Competences: A22 and A32.	50
Objective test	A22 A23 A32 A33 B2 B13	A33 B2 B13 The student will have the option of passing the subject by course as long as he attends 80% of the face-to-face classes and passes the partial tests, if any. Class attendance will be valued with up to 10%, taking into account the student's participation, the resolution of the exposed exercises and the evaluation made by the teaching staff throughout the course. The final qualification will be the result of the averages obtained in the partial tests and / or the final test, being necessary to obtain a minimum grade of 5.0 in each of the tests that is made. Objective written test to evaluate the knowledge and understanding of the basic contents of the subject, considering the abilities and skills of the student, and their strategies and formulations in solving problems. You can combine different types of questions and problems. Each partial test (P1 and P2) will mean 50% and the global objective test (average mark of both) will report 100% of the total evaluation of the subject. Objective written test. It will be mandatory for those students who do not participate or pass the partial tests of the subject throughout the course. It allows evaluating and verifying the expected results regarding the global content of the subject and verifying the degree of achievement of the proposed objectives. The global final exam, as a single assessment, will consist of a test composed of a theoretical part and a problem-solving part with independent assessment, being necessary to obtain a minimum of 5 points in each: a) theoretical (50%); b) practice (50%). Competences: A22, A23, A27, A31, A32, A33 and A38	50
Others			

Assessment comments
Final exam: The objective written test will be compulsory for those students who have not participated in or passed the continuous evaluation of the subject throughout the course. The global final exam, as a single evaluation, will consist of a test consisting of a theoretical part and a problem solving part with independent assessment, being necessary to obtain a minimum of 5 points in each and an average of 5: a) theoretical 50% ; b) 50% practice. The evaluation criteria contemplated in Table A-II / 1 of the STCW Code, and included in the Quality Assurance System, will be taken into account when designing and carrying out the evaluation. Students with recognition of part-time dedication and academic waiver of attendance exemption, as established by the "REGULATION OR RULES OF DEDICATION TO THE STUDY OF TWO STUDENTS OF GRAO NA UDC (Arts. 2.3; 3.b; 4.3 and 7.5) (05/04/2017) will be able to take the partial tests, if any, without the need to attend 80% of the face-to-face classes, as long as the teachers are duly informed at the beginning of the course. entrust this student with different tasks / problems throughout the course to be exposed during tutoring hours.

Sources of information

Basic	BIBLIOGRAFÍA BÁSICA DE LA ASIGNATURA:ESTIBA DE CARGAS SÓLIDAS, Felipe Louzán. Cartamar, A Coruña, 2016.Código internacional para la construcción y el equipo de buques que transportes gases licuados a granel. OMI.Código IMDG, IMO 2012.Código IMSBC, IMO 2012.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.Manual de estiba de mercancías sólidas. Ricardo González Blanco, Ediciones UPC 2006Tratado 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.Hatch Cover Inspections: A Practical Guide. Walter Vervloesem AMNI. The Nautical Institute, 2003.Hatch Covers: Operation, Testing and Maintenance. Mike Wall. Witherby Seamanship International, 2008.Steel: Carriage by Sea, fifth edition. Arthur Sparks & Frans Coppers. Lloyd?s Practical Shipping Guides, London 2009.Manejo de cargas: Riesgos y medidas preventivas, 2ª edición. Luis Mª Azcuénaga Linaza. FC Editorial, Madrid 2010.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.Cargo Ventilation: A Guide to Good Practice. David Anderson and Daniel Sheard. North of England P&I Association. Newcastle upon Tyne, 2006.Hatch Cover Maintenance and Operation: A Guide to Good Practice, Second Edition. David Byrne. . North of England P&I Association. Newcastle upon Tyne, 2005.Draught Surveys: A Guide to Good Práctice. Jim Dibble and Peter Mitchell.. North of England P&I Association 1998
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Ship's Theory I/631G01208
Subjects that are recommended to be taken simultaneously
Ship's Theory II/631G01404
Subjects that continue the syllabus
Special Cargoes Transport/631G01401
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.