



Teaching Guide

Identifying Data					2024/25
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	Pérez Canosa, José Manuel	E-mail	jose.pcanosa@udc.es		
Web	https://www.udc.es/es/nauticaemaquinas/				
General description	To train students in the aspects related to loading, unloading, stowage and safe transport of different types of general cargo and solid bulk cargoes on ships.				

Study programme competences / results

Code	Study programme competences / results
A58	RA5C-Identify ship components.
A61	RA20C-Interpret plans and/or technical documentation
B31	RA9H-Effectively solve practical problems associated with the subject by applying the knowledge acquired.
B42	RA31H?Inspect and report on defects and malfunctions in cargo spaces, hatches and ballast tanks
B54	RA53H?Transporting dangerous goods
B55	RA54H?Controlling trimming, stability and stresses
B78	RA79H?Take precautions to prevent pollution of the marine environment.
C23	RA30X?Overseeing the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.
C24	RA32X?Ensuring compliance with pollution prevention requirements
C25	RA33X?Maintaining the seaworthiness of the ship
C27	RA37X?Monitoring compliance with legislative requirements
C32	RA51X?Plan and ensure the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.
C33	RA52X?Assess reported failures and defects, in cargo spaces, hatch covers and ballast tanks, and take appropriate action
C34	RA55X?Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, maritime security and protection of the marine environment.

Learning outcomes

Learning outcomes	Study programme competences / results		
RA5C-Identify ship components	A58		
RA9H-Effectively solve practical problems associated with the subject by applying the knowledge acquired.	A61		
RA20C-Interpret plans and/or technical documentation		B31	
RA30X-Overseeing the loading, stowage and securing of cargo, and its care during the voyage and disembarkation			C23
RA31H-Inspect and report on defects and malfunctions in cargo spaces, hatches and ballast tanks		B42	
RA32X-Ensuring compliance with pollution prevention requirements			C24
RA33X-Maintaining the seaworthiness of the ship			C25
RA37X-Monitoring compliance with legislative requirements			C27
RA51X-Plan and ensure the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.			C32
RA52X-Assess reported failures and defects, in cargo spaces, hatch covers and ballast tanks, and take appropriate action			C33
RA53H-Transporting dangerous goods		B54	



RA54H-Controlling trimming, stability and stresses		B55	
RA55X-Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea, maritime security and protection of the marine environment			C34
RA79H-Take precautions to prevent pollution of the marine environment		B78	

Contents	
Topic	Sub-topic
TOPIC 1. Gear and means of loading and unloading	Motones. Pastecas. Aparellos. Puntais de carga. Plumas. Grúas. Manobras con puntais. Esforzos sobre os puntales, roldanas. Cables de aceiro. Características dos cables de cordóns. Coidados e mantemento dos cables. Selección dun cable. Confección de gazas. Mantemento de plumas e puntais.
TOPIC 2. Hatch covers	Tapas de escotillas: funcións e características. Tipos de escotillas metálicas. Estanqueidade das escotillas. Probas de estanqueidade das escotillas. Inspeccións e mantemento 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. Factor de estiba. Soleras. Utilaxe de estiba. Envases e embalaxes. Carga xeral. O buque de carga xeral. O cargueiro polivalente. Averías e riscos das adegas. Preparación das adegas. Lavado de adegas. 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. Regras para evitar os danos por condensación. Ventiladores de adegas. Deshumidificadores de adegas. Ventilación considerando os tipos de mercancías. Sistemas de ventilación de adegas. Táboas de humidade absoluta e 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 produtos de aceiro: bobinas, tochos, palanquilla, planchas, aceiro para estruturas, barras de acero e varilla en atados, tuberías e rolos de alambre. Obligacións 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 estrutura dun bulk carrier. A seguridade dos bulk carriers: Capítulo XII del SOLAS. Regras unificadas da IACS para graneleiros. Distribución da carga. Medidas adicionais para bulk carriers. Problemas potenciais durante as operacións 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 natureza química. Enrasado de cargas a granel. Limpeza de adegas. 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. Limitacións estruturais ao preparar un plan de carga en un B/C. Cálculo da carga embarcada. Proba de nitrato de prata.
TOPIC 8. Stowage calculations	Uso de táboas 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



<p>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.</p>	<p>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.</p>
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Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Guest lecture / keynote speech	A58 A61 B31 B42 B54 B55 B78 C23 C24 C25 C27 C32 C33 C34	30	30	60
Objective test	A61 B31 B54 B55 C23 C24 C25 C27 C32 C34	4	0	4
Laboratory practice	A61 B31 B55 C24 C25 C32 C34	30	50	80
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 of the topics with the support of Tics, when deemed necessary. As a complement to the theoretical classes, different loading and stowage calculation problems are presented in different ship models.
Objective test	The theoretical 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 students will be provided with sufficient material to pass. The test will also include the resolution of one to three problems (practical exercises) of loading and stowage of the same type as those solved in class.
Laboratory practice	Resolution of different loading and stowage calculations with different types of goods and vessels. Students will have to solve the problems proposed by the teacher in order to apply theoretical knowledge in a practical way and/or using software.

Personalized attention	
Methodologies	Description
Laboratory practice Guest lecture / keynote speech	During the tutoring timetable set by the Nautical School, and also on any other date previously agreed between the students and the teacher. Tutorials can be face-to-face or telematic (Teams), previous agreement.

Assessment			
Methodologies	Competencies / Results	Description	Qualification
Laboratory practice	A61 B31 B55 C24 C25 C32 C34	The final objective test will consist of solving two loading and stowage calculations (with different types of goods and vessels), similar to those solved in class. It will be compulsory for students who do not pass the evaluation of problem solving per course, if they have done so.	50



Objective test	A61 B31 B54 B55 C23 C24 C25 C27 C32 C34	<p>It will be the result of the averages obtained in the partial tests (if any) and/or the final test.</p> <p>Objective written test to assess knowledge and understanding of the basic contents of the subject, considering the students' skills and abilities, and their strategies and formulations in problem solving. It may combine different types of questions and problems.</p> <p>Each partial test (P1 and P2) will be worth 50%. The final grade will be the result of the averages obtained in the partial tests and/or the final test, being necessary to pass the subject to obtain a minimum grade of 5.0 in each of the tests.</p> <p>Objective written test. This will be compulsory for those students who do not participate or do not pass the assessment during the course. It allows to evaluate and check the expected results in terms of the overall content of the subject and to verify the degree of achievement of the proposed objectives.</p> <p>The overall 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 5.0 points in each: a) theoretical (50%); b) practical (50%).</p>	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.

All aspects related to "academic dispensation", "dedication to study", "permanence" and "academic fraud" will be governed in accordance with the current academic regulations of the UDC.

Sources of information



Basic	<p>BIBLIOGRAFÍA BÁSICA DE LA ASIGNATURA: Estiba de cargas sólidas. F. Louzán. Cartamar, A Coruña, 2016. Problemas de Estiba y Transportes Especiales. F. Louzán e José M. Pérez-Canosa. Cartamar, A Coruña, 2024. 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 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. 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 Khaliq. 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 Practice. Jim Dibble and Peter Mitchell. North of England P&I Association 1998</p>
Complementary	

Recommendations	
Subjects that it is recommended to have taken before	
Ship's Theory I/631G01208	
Subjects that are recommended to be taken simultaneously	
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.