



## Teaching Guide

Identifying Data					2024/25
Subject (*)	Special Cargoes Transport	Code	631G01401		
Study programme	Grao en Náutica e Transporte Marítimo				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	1st four-month period	Fourth	Optional	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	<a href="https://www.udc.es/es/nauticaemaquinas/">https://www.udc.es/es/nauticaemaquinas/</a>				
General description	Complementary subject of Cargo Stowage (3rd year of Degree) with the purpose of training students in all aspects related to loading, unloading, stowage, cargo lashing and safe transport of goods 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
B56	RA57H?Develop contingency plans for fault control, and act effectively in such situations.
B78	RA79H?Take precautions to prevent pollution of the marine environment.
B102	RA105H?Organise on-board emergency procedures
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		
RA20C. Interpret plans and/or technical documentation	A61		
RA9H. Effectively solve practical problems associated with the subject by applying the knowledge acquired.		B31	
RA31H. Inspect and report on defects and malfunctions in cargo spaces, hatches and ballast tanks		B42	
RA53H. Transporting dangerous goods		B54	
RA54H. Controlling trimming, stability and stresses		B55	
RA57H. Develop contingency plans for fault control, and act effectively in such situations.		B56	
RA79H. Take precautions to prevent pollution of the marine environment.		B78	
RA105H. Organise on-board emergency procedures		B102	



RA30X. Overseeing the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.			C23
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
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

Contents	
Topic	Sub-topic
1. GRAIN CARGOES	<p>Introducción</p> <p>Código internacional para o transporte de grao</p> <p>Ángulo de reposo</p> <p>Buques para o transporte de grao</p> <p>Documento de autorización</p> <p>Cálculo dos momentos escorantes supostos</p> <p>Exemplo de determinación do momento volumétrico escorante suposto nunha adega chea</p> <p>Prescripcions sobre estabilidade</p> <p>Estiba de grao a granel</p> <p>Métodos para reducir o momento escorante</p> <p>Planificación e control das operacións de carga e descarga</p> <p>Obtención dos momentos escorantes supostos para diferentes estibas</p> <p>Cálculo de estabilidade para os buques que transporten graos a granel</p> <p>Procededementos seguros de manipulación, estiba e suxeción da carga, incluídas as cargas sólidas a granel, e a súa influencia na seguridade da vida humana e do buque.</p> <p>Precaucións que deben tomarse para evitar a contaminación do medio mariño</p>
2. CARGO STOWAGE AND LASHING	<p>Forzas que se orixinan no transporte de mercadorías por mar</p> <p>Compoñentes dunha trinca</p> <p>Forza de fricción ou rozamento</p> <p>Métodos de trincaxe</p> <p>Determinación da resistencia dos dispositivos de suxeción</p> <p>Camas de estiba</p> <p>Convenios da OMI relativos a seguridade da vida humana no mar e a protección do medio mariño.</p> <p>O Código CSS</p> <p>Suxeción de cargas non normalizadas</p> <p>Método empírico de trincaxe</p> <p>Método de cálculo avanzado</p> <p>Método alternativo: equilibrio de forzas</p> <p>Manual de suxeción da carga</p> <p>Estiba y suxeción de tubarías de gran diámetro na cuberta</p> <p>Outros métodos de trincaxe</p> <p>Coñecemento dos efectos da carga, incluídas as cargas pesadas, na navegabilidade e estabilidade do buque.</p> <p>Procededementos seguros de manipulación, estiba e suxeción da carga e a súa influencia na seguridade da vida humana e do buque</p>



3. WOODEN CARGO AND OTHER FOREST PRODUCTS	Cargamentos de madeira Propiedades da carga Principios de estiba e sujeción Medios de sujeción Estiba de troncos, postes e trozas Estiba de madeira aserrada solta ou en fardos Métodos alternativos de sujeción da cubertada Precaucións durante o viaxe Estabilidade Estiba de rolos de papel Carga de balas Líñas de carga para o transporte de madeira na cuberta Cálculo da carga máxima a embarcar na cuberta
4. REEFER SHIPS AND PERISHABLE GOODS	Buques frigoríficos Sistemas de refrixeración Transporte de mercadorias perecedeiras Control de atmósferas Transporte de cargas refrixeradas en contenedores Preparación das adegas dun buque reefer Estiba de cargas refrixeradas Cuidados da carga Temperaturas recomendadas de transporte
5. CONTAINER SHIPS	O contenedor: introducción Dimensións e características dos contenedores Tipos de contenedores Buques portacontenedores Tipos de buques portacontenedores Planos de estiba Elementos de trincaxe dos contenedores Trincaxe de contenedores Forzas e tipos de fallos no trincaxe Principios de estiba Navegación con mal tempo nun buque portacontenedores
6. RO-RO SHIPS AND RO-RO CARGOES	Desenvolvemento do buque ro-ro O buque ro-ro Tipos de buques ro-ro O buque car carrier Rampas de acceso Utilaxe ro-ro Equipos para o manexo e a estiba da carga O AGV IPSI Normas xerais para o transporte de vehículos Estiba e trincaxe de automóviles Estiba e trincaxe de vehículos pesados Diagramas de trincaxe para buques que realicen viaxes curtas Precaucións para a protección e seguridade dos pasaxeiros en situacións de emerxencia



7. PROBLEMS / PRACTICAL EXERCISES	<p>Resolución de problemas de carga relacionados co programa:            Determinación da carga a embarcar e o reparto da carga para deixar o buque en calados.            Cálculos de trincaxe da carga nas adegas e na cuberta polo método avanzado e o alternativo.            Cálculos de trincaxe de tubarías de gran tamaño na cubierta.            Cálculos da máxima carga de madeira a embarcar na cubierta.            Cálculos de graos</p>
<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>

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 B56 B78 B102 C23 C24 C25 C27 C32 C33 C34	30	30	60
Laboratory practice	A58 A61 B31 B42 B54 B78 B102 C23 C24 C25 C27 C32 C33	30	50	80
Objective test	A58 A61 B31 B42 B54 B55 B56 B78 B102 C23 C24 C25 C27 C32 C33 C34	4	0	4
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 and with different goods, as well as lashing calculations.
Laboratory practice	Resolution of different loading, stowage and lashing 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.
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, stowage and lashing calculations of the same type as those solved in class.

Personalized attention	
Methodologies	Description



Laboratory practice	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.
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Assessment			
Methodologies	Competencies / Results	Description	Qualification
Objective test	A58 A61 B31 B42 B54 B55 B56 B78 B102 C23 C24 C25 C27 C32 C33 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
Laboratory practice	A58 A61 B31 B42 B54 B78 B102 C23 C24 C25 C27 C32 C33	The final objective test will consist of solving two loading, stowage and lashing 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
Others			

Assessment comments
<p>Finalexam: The objective written test will be compulsory for those students who havenot participated in or passed the continuous evaluation of the subjectthroughout the course. The global final exam, as a single evaluation, willconsist of a test consisting of a theoretical part and a problem solving partwith independent assessment, being necessary to obtain a minimum of 5 points ineach 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 recollection of the Quality Assurance System, will be taken into account at the time of designing and carrying out the evaluation.</p> <p>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.</p>

Sources of information



<b>Basic</b>	<p>Estiba de Cargas Sólidas, Felipe Louzán, Cartamar, A Coruña, 2016. Problemas de Estiba y Transportes Especiales. F. Louzán y José M. Pérez-Canosa. Cartamar, A Coruña, 2024. Código internacional para la construcción y el equipo de buques que transporten gases licuados a granel. OMI. Código IMDG, IMO 2018. Código IMSBC, IMO 2018. 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 &amp; 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 &amp; 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&amp;I Association. Newcastle upon Tyne, 2006. Hatch Cover Maintenance and Operation: A Guide to Good Practice, Second Edition. David Byrne. . North of England P&amp;I Association. Newcastle upon Tyne, 2005. Draught Surveys: A Guide to Good Practice. Jim Dibble and Peter Mitchell.. North of England P&amp;I Association 1998. Código de prácticas de seguridad para buques que transporten cubiertas de madera, IMO 1992. Código de prácticas de seguridad para buques que transporten cubiertas de madera, IMO 2011. Cargo Stowage and Securing: A Guide to Good Practice, Second edition. Charles Bliault. North of England P&amp;I Association. Newcastle upon Tyne, 2007. Deck Stowage and Securing of Pipes. Charles Bliault. North of England P&amp;I Association. Newcastle upon Tyne, 2008. Reefer Transport &amp; Technology. Capt. A.W.C. Alders. Rotterdam Marine Chartering Agents B.V., The Neetherlands, 1995. Lashing and Securing of Deck Cargoes, second edition. The Nautical Institute, London 1994. Stability, Trim and Strength for Merchant Ships and Fishing Vessels, second edition. Ian Clark. The Nautical Institute, 2006. El transporte en contenedor. Ricard Mari y Jaime Rodrigo de Larrucea, Marge Books, 2012.</p>
<b>Complementary</b>	

**Recommendations**

**Subjects that it is recommended to have taken before**

Ship's Theory I/631G01208

Cargo Stowage/631G01301

**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.