Teaching Guide					
Identifying Data					2024/25
Subject (*)	Ship's Theory I			Code	631G01208
Study programme	Grao en Náutica e Transporte Marítimo				
Descriptors					
Cycle	Period	Year		Type	Credits
Graduate	1st four-month period	Second		Obligatory	6
Language	Galician				
Teaching method	Face-to-face				
Prerequisites					
Department	Ciencias da Navegación e Enxeñaría Mariña				
Coordinador	Freire Piñeiro, Ramon		E-mail	ramon.freire@udc.es	
Lecturers	Freire Piñeiro, Ramon Sánchez Girón, Javier Ramón		E-mail	ramon.freire@udc.es javier.sanchez5@udc.es	
Web					
General description	Coñecemento do alumno do comportamente do buque como flotador. ademaís das cuestions sobor a distribución da carga, estabilidade, consumo, etc. E decir: aplicación da xeometría e mecànica o estudio do movemento do buque en calqueira dos estados que aquel se poida atopar.				

Study programme competences / results	
Code	Study programme competences / results
A55	RA2C-Identify and relate acquired knowledge to other disciplines
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.
B55	RA54H?Controlling trimming, stability and stresses
B56	RA57H?Develop contingency plans for fault control, and act effectively in such situations.
C23	RA30X?Overseeing the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.
C25	RA33X?Maintaining the seaworthiness of the ship
C27	RA37X?Monitoring compliance with legislative requirements
C28	RA39X?Contributing to the safety of personnel and the vessel
C32	RA51X?Plan and ensure the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.

Learning outcomes			
Learning outcomes	Study programme competences / results		
RA2C-Identify and relate acquired knowledge to other disciplines	A55		
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	
RA54H-Controlling trimming, stability and stresses		B55	
RA57H-Develop contingency plans for fault control, and act effectively in such situations.		B56	
RA30X-Overseeing the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.			C23
RA33X-Maintaining the seaworthiness of the ship			C25
RA37X-Monitoring compliance with legislative requirements			C27
RA39X-Contributing to the safety of personnel and the vessel			C28
RA51X-Plan and ensure the loading, stowage and securing of cargo, and its care during the voyage and disembarkation.			C32

Contents

Topic	Sub-topic
Cap. 1 First Principles	Form´s plan. Reference line. Design trim. Draft scale. Change of trim. Deformation of the ship´s structure. Hull form
Cap. 2 Areas and Volumes	Areas of plan figures. Surface areas and volumes. Areas of water planes and other ship´s sections. Trapezoidal rule. Simpson´s rules, First, Second. The 5/8 Rule. Sharp-ended waterplanes. Volume of ship shapes. Half intervales. Coefficients of fineness. TPC and TPI. Change of draft by density change. Load line disc. Displacement calcule case constant trim and Know.
Cap. 3 Bouyancy	Reserve bouyancy. Bouyancy coefficient. Design co-efficients. Tonnage measurement. Panamá and Suez tonnage. Certificates of Tonnage. International load line Certificate.
Cap. 4 Centres of Gravity and bouyancy	Variation of "G" and "B" by weights added, removed or shifted about. Theorem of Moments. Shift of "B" by effect of heeling - list the ship.
Cap. 5 Metacentre	Concept of Metacentre radius. Metacentre height. To find transverse BM. Metacentric diagrams. Using change of trim GM longitudinal. Hidrostatic curves. First Moment of inertia.
Cap. 6 Stability	Concept of equilibriun. stable, neutral and unstable. Longitudinal metacentric height. Concept os stability, types: static and dinamic. The righting lever. Moment of statc stability. Stability curves. KN and GZ curves. Stability cross curves for M/V "Tanker". Cross curves of stability for M/V "Cargo-carrier". Information and caracteristics from stability curves. Dynamical stability concept. Range of stabilit. Angle of vanishing stability. Maximun righting lever and angle of heel at which it occurs. IMO criteria. Minimun IMO intact stability criteria. Torremolinos criteria. Spanish criteria and Rahola. Trim or longitudinal stability. Second moment of water plane. The International Grain Code (IMO). The effect of a shift of solid bulk cargo on the curves of static stability. Grain loading information to the supplied. Derivation of the heeling arm.
Cap. 7 Effect of added weights onboard	Inclining experiment or stability test. Effect of shifting weight. The moment to change trim one centimetre (MCTC). Find the change of draft forward and aft due to change of atrim. Effect of loading and(or discharging weights. Suspended weights. Loading a weight to keep a constant draft aft and/or forward. Free surface effect. Representation of free surface data in shio´s tank. Soundind/ullage tables. Fachs influencing free surface grain effect. The International Grain Code (IMO). The effect of a shift of solid bulk cargo on the curves of static stability. Grain loading information to the supplied. Derivation of the heeling arm.
Cap. 8 Operation with weights	To find where to place a weight to keep the draft constant at one of the pedrpendiculars. Using trim to find the position of the centre of flotation. Loading a weight to produce a required draft. The use of Moments about the after perpendiculars. Trim diagram. Emerge coefficient.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Workshop	A58 A61 B55 B56	20	10	30
Objective test	C23 C25 C27 C28 C32	6	0	6
Binary questions	A55 A58 A61 B31 B55 B56	1	0	1
Guest lecture / keynote speech	A55 A58 A61 B31	28	84	112

Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Workshop	Realización dos traballos e problemas
Objective test	Evaluación dos coñecementos adquiridos durante o curso por o alumnado
Binary questions	Na proba obxetiva escrita, parte primeira, se farán unha serie de cuestión con este tipo de modalidade
Guest lecture / keynote speech	Clases impartidas na pizarra apoidas das TICs na docencia universitaria

Personalized attention	
Methodologies	Description
Guest lecture / keynote speech Workshop Binary questions Objective test	The teacher to be at his office room along specificated time in step 6: Personalized attention to resolve doubts

Assessment			
Methodologies	Competencies / Results	Description	**Qualification**
Objective test	C23 C25 C27 C28 C32	Avaliación ordinaria dos coñecementos adquiridos o longo do cuadrimestre sobre o estudio da teoría aplicada o buque. Na avaliación ordinaria en primeira ou segunda opción, necesita-se acadar a nota de cinco puntos sobre dez, en cada unha das probas escritas: nunha primeria de 20 minutos de tempo, máximo 40 minutos, sobre coñementos teóricos, e unha segunda parte de problemas na que dispón de dúas horas para a súa realización, máximo dúas horas e quince minutos.	100

Assessment comments

Students with recognition of part-time dedication and academic exemption from attendance, as established in the "REGULATION GOVERNING THE STUDY DEDICATION REGIME FOR UNDERGRADUATE STUDENTS AT UDC (Arts. 2.3; 3.b; 4.3 and 7.5) (04/05/2017)," may take partial exams, if applicable, without the need to attend 80% of face-to-face classes, provided that the professors are duly informed at the beginning of the course. However, the professors may assign different assignments/problems to this group of students throughout the course to be presented during tutorial hours, using the TEAMS system if deemed appropriate by the professor. The fraudulent completion of exams or assessment activities, once confirmed, will result directly in a failing grade in the respective exam session: the student will be graded as "fail" (numerical grade of 0) in the corresponding academic year's exam session, whether the misconduct occurs in the first opportunity or the second. In this regard, their grade will be modified in the first opportunity's record, if necessary. The assessment criteria outlined in Table A-II/2 of the STCW Code, as documented in the Quality Assurance System, will be considered when designing and conducting the assessment.

Sources of information	
Basic	- CESAREO DIAZ FERNANDEZ (1969). TEORIA DEL BUQUE. Barcelon - C.B.Barrass and D.R. Derrett (2007). SHIP STABILITY. Oxford - H.J.Pursey (1992). MERCHANT SHIP STABILITY. Glasgow - Dr.C.B.Barrass (2001). SHIP STABILITY. Oxford - Antonio Bonilla de la Corte (1978). TEORIA DEL BUQUE. Cadiz - CESAREO DIAZ FERNANDEZ (1975). Resumen de Problemas de TB. Barcelona - Martin Rhodes (2009). Ship Stability OOW. Glasgow - Martin Rhodes (2015). Ship Stability. Mates/Masters. Edinburgh
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Mathematics I/631G01101 Phisics/631G01103 Naval Construction/631G01105
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Ship's Theory II/631G01404
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.