Teaching Guide					
Identifying Data					2023/24
Subject (*)	Advanced Navigation			Code	631510203
Study programme	Mestrado Universitario en Náutica e Transporte Marítimo				
Descriptors					
Cycle	Period	Year		Type	Credits
Official Master's Degree	1st four-month period	First		Obligatory	6
Language	SpanishGalician				
Teaching method	Face-to-face				
Prerequisites					
Department	Ciencias da Navegación e Enxeñaría Mariña				
Coordinador	Lama Carballo, Francisco Javier		E-mail	javier.lama@udc.es	
Lecturers	Lama Carballo, Francisco Javier Lopez Varela, Pablo		E-mail	javier.lama@udc.es pablo.lopez@udc.es	
Web					
General description					

Study programme competences	
Code	Study programme competences
A1	Capacidade para planificar unha viaxe e dirixir a navegación.
A2	Capacidade para determinar por calquera medio a situación e exactitude do punto resultante.
A3	Capacidade para determinar e compensar os erros do compás.
A5	Capacidade para establecer os sistemas e procedementos do servizo de garda.
A6	Capacidade para manter a seguridade da navegación utilizando información do equipo e os sistemas de navegación para facilitar a toma de decisións.
A7	Capacidade para manter a seguridade da navegación utilizando o SIVCE e os sistemas de navegación conexos para facilitar a toma de decisións.
A19	Capacidade para a utilización das cualidades de liderado e xestión.
B4	Capacidade para comunicarse de forma efectiva nunha contorna de traballo.
B9	Capacidade de análise e síntese.
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
B14	CB8-Que os estudantes sexan capaces de integrar coñecementos e enfrontarse á complexidade de formular xuízos a partires dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vencelladas á aplicación dos seus coñecementos e xuízos
B15	CB9-Que os estudantes saiban comunicar as suas conclusións e os coñecementos e razóns últimas que as sustentan a públicos especializados e non especializados dun xeito claro e sin ambigüidades
B16	CB10-Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en grande medida autodirixido ou autónomo.
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
C11	C11-Capacidade para integrar coñecementos e enfrontarse á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos

Learning outcomes			
Learning outcomes	Study programme competences		
Knowledge and advanced management of navigation systems and equipment. Use of information obtained from them for the planning and execution of navigation. Possibility of planning the trip and direct browsing safely. Possibility of determining and compensating the deviations of the needle. Ability to establish the systems and procedures of the guard service. Acquire the skills, knowledge and attitudes set out in Table A-II/2 of the STCW 2010.	AJ1 AJ2 AJ3 AJ5 AJ6 AJ7 AJ19	BC4 BC9 BC12 BC13 BC14 BC15 BC16	CC2 CC6 CC10 CC11
Knowledge and use of particular methodologies and position lines of astronomical and/or terrestrial origin to determine the position. Acquiring the competences, knowledge and attitudes established in Table A-II/2 of the STCW 2010.	AJ2 AJ6	BC9 BC12 BC13 BC14	CC6 CC10 CC11
Knowledge and use of advanced methods of naval kinematics and their application in decision making. Acquiring the competences, knowledge and attitudes established in Table A-II/2 of the STCW 2010.	AJ1 AJ5 AJ6 AJ7 AJ19	BC4 BC9 BC13 BC14 BC15	CC6 CC10 CC11

Contents	
Topic	Sub-topic
1- "Voyage planning" advanced.	Voyage planning and navigation for all conditions by acceptable methods of plotting ocean tracks, taking into account, e.g.: .1 restricted waters .2 meteorological conditions .3 ice .4 restricted visibility .5 traffic separation schemes .6 vessel traffic service (VTS) areas .7 areas of extensive tidal effects Routeing in accordance with the General Provisions on Ships? Routeing Reporting in accordance with the General principles for Ship Reporting Systems and with VTS procedures The development of this topic complies with column 2, Knowledge, Understanding and Sufficiency, of the STCW Convention, modified by Manila 2010, of table AII/2.

2- Use of navigation equipment and systems, including ECDIS and its related systems, to facilitate decision-making and maintain the safety of navigation.	Advanced naval kinematics An appreciation of system errors and thorough understanding of the operational aspects of navigational systems Blind pilotage planning Evaluation of navigational information derived from all sources, including radar and ARPA, in order to make and implement command decisions for collision avoidance and for directing the safe navigation of the ship The interrelationship and optimumuse of all navigational data available for conducting navigation ECDIS and associated navigation systems: Management of operational procedures, system files and data, including: .1 manage procurement, licensing and updating of chart data and system software to conform to established procedures .2 system and information updating, including the ability to update ECDIS system version in accordance with vendor?s product development .3 create and maintain system configuration and backup files .4 create and maintain log files in accordance with established procedures .5 create and maintain route plan files in accordance with established procedures .6 use ECDIS log-book and track history functions for inspection of system functions, alarm settings and user responses Use ECDIS playback functionality for passage review, route planning and review of system functions The development of this topic complies with column 2, Knowledge, Understanding and Sufficiency, of the STCW Convention, modified by Manila 2010, of table AII/2.
3- Advanced methodology for the determination of the position and execution of navigation through celestial, terrestrial observations and the use of electronic aids to navigation.	Position determination in all conditions: .1 by celestial observations .2 by terrestrial observations, including the ability to use appropriate charts, notices to mariners and other publications to assess the accuracy of the resulting position fix .3 using modern electronic navigational aids, with specific knowledge of their operating principles, limitations, sources of error, detection of misrepresentation of information and methods of correction to obtain accurate position fixing The development of this topic complies with column 2, Knowledge, Understanding and Sufficiency, of the STCW Convention, modified by Manila 2010, of table AII/2.
4- Compass compensation.	Ability to determine and allow for errors of the magnetic and gyro-compasses Knowledge of the principles of magnetic and gyro-compasses An understanding of systems under the control of the master gyro and aknowledge of the operation and care of the main types of gyro-compass The development of this topic complies with column 2, Knowledge, Understanding and Sufficiency, of the STCW Convention, modified by Manila 2010, of table AII/2.

5- Establish watchkeeping arrangements and procedures. Leadership and management qualities	Thorough knowledge of the content, application and intent of the Principles to be observed in keeping a navigational watch Ability to apply task and workload management, including : .1 planning and co-ordination .2 personnel assignment .3 time and resource constraints .4 prioritization Knowledge and ability to apply effective resource management: .1 allocation, assignment, and prioritization of resources .2 effective communication on board and ashore .3 decisions reflect consideration of team experiences .4 assertiveness and leadership, including motivation .5 obtaining and maintaining situation awareness The development of this topic complies with column 2, Knowledge, Understanding and Sufficiency, of the STCW Convention, modified by Manila 2010, of table AII/2.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A1 A2 A3 A5 A6 A7 B13 B14 B16 C6 C10 C11	35	50	85
Workbook	A1 A2 A3 A5 A6 A7 B9 C2	0	6	6
Simulation	A1 A2 A5 A6 A7 A19 B4 B9 B13 B14 B15 C2 C6 C10 C11	4	0	4
Laboratory practice	A1 A2 A3 B12 B13 B14 C10	13	25	38
Objective test	A1 A2 A3 A5 A6 A7 B9 B13 C6	4	9	13
Personalized attention		4	0	4
(*)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	Lecture of the subject complemented with the use of audiovisual presentations and the introduction of some questions addressed to the students, in order to transmit knowledge and facilitate learning. Within this dynamic the intervention of the students will be open for the realization of questions or comments, which could lead to open debates. The texts and/or audiovisual presentations used will be made available to the student body sufficiently in advance so that they can read it beforehand.
Workbook	Documentation provided to students where the content to be developed in the subject is studied in depth.
Simulation	Exercises performed in the maneuver and navigation simulator in which students will be placed before hypothetical conditions that simulate situations that could occur in a real context, with the purpose of using them as learning experiences and evaluation procedures. In these simulations the students will demonstrate their skills in specific situations, their knowledge, their ability to make decisions.
Laboratory practice	Realization of practical exercises related to the theoretical concepts explained in the lectures

Objective test	Written test used to evaluate learning, whose distinctive feature is the ability to determine whether the answers given are correct or not. It is a measurement instrument, rigorously elaborated, that allows evaluating knowledge, abilities, skills, performance, etc. Objective testing can combine different types of questions: multiple-choice, short-answer, and / or developmental questions. You can also build with only one type of any of these questions.

Personalized attention	
Methodologies	**Description**
Guest lecture / keynote speech Simulation Laboratory practice	The follow-up of the work done by the students, both in the theoretical and practical classes, will be carried out continuously in the classroom and, if specific needs are detected, additional tutorials of individual character or in a very small group of support will be established. In the case of students with recognition of part-time dedication and academic waiver of exemption from attendance, a series of mandatory tutorials (at least one for each topic), face-to-face or remote, must be agreed with the teacher throughout the course to accredit the follow-up of the matter.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Objective test	A1 A2 A3 A5 A6 A7 B9 B13 C6	For students with regular class attendance (at least 80%), four partial tests will be carried out throughout the course to assess the follow-up of the work done during the semester (three practical exercises and a theoretical test). Those who pass all the partial exams with an average grade equal to or greater than 5 will not have to take the final exam, unless they wish to raise the grade for the course. The minimum mark to be able to compensate by arithmetic mean each one of the partials at the time of obtaining the mark of the course will be 3.5. In case of obtaining a grade lower than 3.5 in any of the partial exams, the grade for the course will be failed (with a maximum grade of 4). In case of not showing up to any of the partial exams, it will be considered that the student is not following the continuous evaluation system described and will be graded by course as not showing up. Students who do not follow the evaluation system described or fail the subject by course, must take the final exam of the official call, in which the entire subject will enter. The partial tests passed with a grade greater than or equal to 5, will release material for the final exam of the first opportunity, but not for that of the second opportunity (the students who must be examined in the second opportunity must do it for the entire subject). With this methodology, competencies A1, A2, A3, A5, A6, A7, B9, B13, C6 will be evaluated.	95
Simulation	A1 A2 A5 A6 A7 A19 B4 B9 B13 B14 B15 C2 C6 C10 C11	The simulation exercises will require attendance to pass the subject and will be evaluated without a numerical grade (pass or fail). Those students who do not attend 80% of the simulation classes will be classified as unfit. With this methodology, competencies A1, A2, A5, A6, A7, A19, B4, B9, B13, B14, B15, C2, C6, C10, C11 will be evaluated.	0

Laboratory practice	A1 A2 A3 B12 B13 B14 C10	In the event that a student has failed the subject with a grade equal to or greater than 4.5, he may pass the subject as long as he has completed 100% of the practices proposed in class throughout the course. With this methodology, competencies A1, A2, A3, B13, B14, C10 will be evaluated.	5

Assessment comments
Each exam, both partial and final, will consist of several clearly differentiated parts in terms of content and resolution methodology (for example different parts of theory or different types of exercises), which will be corrected separately in base 10. As long as the grade of each of these parts is equal to or greater than 3.5, the note of the examination will be the arithmetic mean of the parties. If a grade lower than 3.5 is obtained in any part of the exam, the exam grade will correspond to the weighted geometric average of the parts (giving greater weight to the lowest grade obtained). Students with recognition of part-time dedication and academic exemption of attendance exemption will not be required a minimum attendance to be able to take part exams, however, they must agree with the teacher a series of tutorials (face-to-face or non-presential) throughout the course to accredit the follow-up of the subject. Those students qualified as unsuitable in the simulation methodology can not pass the subject. In this case even surpassing the objective test and the laboratory practices the student will be qualified with a 4. The evaluation criteria contemplated in Table A-II/2 of the STCW Code, as amended, and included in the Quality Assurance System, will be taken into account when designing and carrying out the evaluation. 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.

Sources of information	
Basic	INTEGRATED BRIDGE SYSTEMS VOL 1: RADAR AND AIS - The Nautical InstituteINTEGRATED BRIDGE SYSTEMS VOL 2: ECDIS AND POSITIONING - The Nautical InstituteNAVIGAZIONE VOL. I Y II. Ideale Capasso, Sergio FedeNAVEGACIÓN Nº 1, 2 Y 3. Moreu Curbera ELECTRONIC SURVEYING AND NAVIGATION ? Simo H. LaurilaRADAR NAVIGATION AND MANEUVERING BOARD MANUAL ? National Imagery And Mapping Agency (http://msi.nga.mil/NGAPortal/MSI.portal?_nfpb=true&_pageLabel=msi_portal_page_62&pubCode=0008)CINEMATICA ANTICOLISIÓN ? Jesús Uribe-Echebarria PILOTING WITH ELECTRONICS ? Luke MeltonRADAR AND ARPA MANUAL ? A. G. Bole & W.O. DineleyDUTTONS NAVIGATION & PILOTING ? Maloney AMERICAN PRACTICAL NAVIGATION ? Bowditch (http://msi.nga.mil/NGAPortal/MSI.portal?_nfpb=true&_pageLabel=msi_portal_page_62&pubCode=0002) BRIDGE TEAM MANAGEMENT. A PRACTICAL GUIDE ? Capt. A.J. Swift ? The Nautical InstituteTHE ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS): AN OPERATIONAL HANDBOOK - Adam WeintritCONVENIO INTERNACIONAL PARA LA SEGURIDAD DE LA VIDA HUMANA EN EL MAR (SOLAS)
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.