SUBJECT TEACHING GUIDE

G1051 - Navigation III

Degree in Nautical Engineering and Maritime Transport

Academic year 2020-2021

1. IDENTIFYING DATA					
Degree	Degree in Nautical Engineering and Maritime Transport			Type and Year	Compulsory. Year 3
Faculty	School of Maritime Engineering				
Discipline	Subject Area: Navegation				
Course unit title and code	G1051 - Navigation III				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web	http://web.unican.es/departamentos/navycn/estudios/detalle-asignatura?c=G1051&p=125&a=2016				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DE LA NAVEGACION Y DE LA CONSTRUCCION NAVAL
Name of lecturer	ANDRES RAFAEL ORTEGA PIRIS
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Other lecturers	JOSE IVAN MARTINEZ GARCIA

3.1 LEARNING OUTCOMES
- Know how to solve Maritime Navigation problems on navigation techniques based on the determination of the position, heading, time, speed and distance in the vessel's kinematics, in loxodromic and orthodromic navigation.
- Plan and conduct a voyage and determine the position in accordance with Rule II / 1 of the STCW Code 2010 as amended
- - Maintain a safe navigation watch in accordance with Rule II / 1 of the STCW Code 2010 as amended
- Use of radar and ARPA for safe navigation in accordance with Rule II / 1 of the STCW Code 2010 as amended

4. OBJECTIVES
Ability to determine the ship's position by use of ortodromic navigation
Determine and compensate the gyroscopic compass errors. Ability to take into account the gyroscopic compasses errors. Knowledge of the principles of gyro compasses. Ability to determine the ship's position using electronic navigational aids: echo sounders and gyroscopic compasses. Knowledge of steering gear control systems, operating procedures and change from manual steering to automatic steering mode and vice versa. Adjusting the controls to achieve the highest performance.
Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA). Ability to operate and to interpret and analyse information obtained from radar. Principal types of ARPA, their display characteristics, performance standards and the dangers of over-reliance on ARPA.
Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice versa. Adjustment of controls for optimum performance
Radar Navigation: Knowledge of the fundamentals of radar and automatic radar ploting aids (APRA). Ability to use radar and to interpret and analyze the information obtained, taking into account the following: Operation, including: factors that affect its performance and precision. Ability to use radar and to interpret and analyze the information obtained, taking into account the following: Operation, including: adjustment initial and conservation of the image, detection of deficiencies in the presentation of information, false echoes, echoes of the sea, radio beacons and RESAR, range and marking; heading and speed of other ships; moment and distance of maximum approach of a ship that crosses, that comes back found or that reaches, identification of critical echoes; detection of changes in heading and speed of other ships; effect of such changes on the course and speed of the ship, application of the International Regulations for Preventing Collisions, 1972, as amended, dotting and concepts of relative and true movement, parallel indices. Main types of APRA, with their display characteristics and performance standards, and dangers of overdependence on APRA. Ability to use APRA, interpret and analyze the information obtained, taking into account the following: operation and precision of the system, tracking capabilities and limitations, and system processing delays, use of operational warnings and system tests, target capture methods and their limitations, true and relative vectors, graphical representation of information on targets and danger zones, deduction and analysis of information, critical echoes, exclusion zones and test maneuvers.

6. COURSE ORGANIZATION	
CONTENTS	
1	True and relative motion applied to navigation.- Naval kinematics. Direct problem.- Naval kinematics. Reverse problem.- Main types of APRA systems and their display characteristics.- Knowledge of the factors that influence the accuracy of vector.- Using a system APRA.- Targets Information.- Risk assessment. The lab works will be held in the navigating and maneuvering simulator, located in the basement floor.
2	GREAT CIRCLE SAILING.- Points and constants defining Great Circle Track.-Great Circle Track Equation.- Deduction of formulas for calculating the constants.- Plotting on a Mercator chart.- Calculation of the great circle distance between two points of the Earth surface.- Calculation of initial course depending on the great circle distance.- Calculation of the coordinates of a point of the track situated at a given distance from the starting or arrival point.- Calculation of final course.- Calculation of individual cases of Great Circle Sailing.- Plotting great circle track on a gnomonic chart and its transfer to the mercator chart.- Composite Great Circle Sailing.-
3	GYRO COMPASSES.- Gyroscopic rigidity and precession.- Two and three degrees of freedom gyro compasses: their behavior.- Effects of the Earth rotation movement.- Deviation of the gyro compass.- Description of the gyro compasses more used in the merchant navy.- Repeaters.- Startup, repeaters synchronization and stop.- Equipment cares.- Autopilot.
4	Depth sonundings. Logs

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Minimum mark: 5.00 Duration: 2 hours Date of completion: After the 3th week of class Reassessment conditions: Final Exam in February Comments: The topics of great circle and rhumb will be included	Written exam	No	Yes	30,00
Minimum mark: 5.00 Duration: 2 hours Date of completion: After the 12th week of class Reassessment conditions: Final Exam in February Comments: The test consists of a theoretical part and a practical part about kinematics to be held in the radar simulator	Written exam	No	Yes	30,00
Simulator practice	Laboratory evaluation	No	No	40,00
TOTAL				100,00

Observations

The student who passes all exams will not have to take the final exam.
The evaluation criteria of the competence will be those set by the STCW 2010.
To pass the subject students must have passed the subjects G 1049 and G1050 Navigation I and Navigation II.
Both in the partial exams and in the final exams, it is compulsory to pass the theoretical part so that the teacher can correct the practical part.
A remote assessment scenario may be presented, which would only be used if the competent health and educational authorities so indicate.

Observations for part-time students

Part-time students will agree with the teacher the time of the partial exams depending on their availability.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Número: 59288
Autor: Moreu Curbera, José María.
Título: Astronomía y navegación / Moreu Curbera, Martínez Jiménez.
Edición: 3a ed.
Editorial: [s.l. : [s.n.], D.L. 1972-1987 (Madrid : Minuesa).
Descripción física: 3 v. : il. ; 24 cm.
Notas: Incluye actualizaciones en T. I y T. III (NR 302586)
Contiene: T. I. Primer curso de náutica - T. II. Segundo curso de náutica - T. III. Curso de capitanes
ISBN: 84-404-0253-8 : (T. 2)
84-85645-01-4 : (T. 1)

Número: 270150
Autor: Bowditch, Nathaniel.
Título: The american practical navigator / originally by Nathaniel Bowditch.
Edición: 2002 bicentennial ed. / prepared by the National Imagery and Mapping Agency.
Editorial: [Deerfield Beach (Florida)] : Lighthouse Press, [2002]
Descripción física: XI, 879 p. : il. n. ; 28 cm. + 1 disco compacto.
ISBN: 978-1-57785-272-8

Apuntes de curso de ARPA suministrados por el profesor