Course guide
280617 - 280617 - Electronic Aids to Navigation

Last modified: 18/01/2024

Unit in charge: Barcelona School of Nautical Studies
Teaching unit: 742 - CEN - Department of Nautical Sciences and Engineering.

Degree: BACHELOR'S DEGREE IN NAUTICAL SCIENCE AND MARITIME TRANSPORT (Syllabus 2010). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 7.5 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: JOSEP ALBERT RIBET GÓMEZ

Others: Segon quadrimestre:
JOAN AGUT TEBÉ - GNTM1, GNTM2, GNTM3
JOSEP ALBERT RIBET GÓMEZ - GNTM1, GNTM2, GNTM3

REQUIREMENTS

Having passed the subject 280610 Coastal navigation

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Knowledge of electronics applied to the ship and offshore installations and their application to board.
2. Knowledge of navigation techniques based on the determination of the position, heading, time, speed and distance. Ability to perform calculations: navigation co Ster kinematics of the ship, reckoning, plane sailing, navigation, great circle, celestial navigation, electronic navigation and inertial navigation. Lift charts.

Generical:
3. Capacitat PER CONCEBRE, I MANAGE TO IMPLEMENT SISTEMES Complexos L'ambit of L'ENGINYERIA NÀUTICA I TRANSPORT MARÍTIM

Transversal:
4. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
5. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

TEACHING METHODOLOGY

- Receive, understand and assimilate knowledge and skills.
- Analyze practical situations and justify the most favorable solutions.
- Perform exercises and deliver them within the established timetable, according to the pace of theorical learning, and in response to the continuous assimilation of contents.

LEARNING OBJECTIVES OF THE SUBJECT

To understand the operation and characteristics of the radio-electric and electronic navigation aid systems, and master their use on board.

Competencies
The ones corresponding to especific 8 and 18 together with the ones in chart A-II/1 of the STCW convention: "Use of Radar and Arpa to maintain safety of navigation" and part of "Use of ECDIS to maintain the safety of navigation" and part of "Plan and conduct a passage and determine position" in its section of Electronic systems of position fixing and navigation.

STUDY LOAD

Type	Hours	Percentage
Hours large group	40,0	21.33
Hours medium group	17,5	9.33
Hours small group	10,0	5.33
Guided activities	7,5	4.00
Self study	112,5	60.00

Total learning time: 187.5 h

CONTENTS

(ENG) RADAR I - RADAR fundamental principles

Full-or-part-time: 1h
Theory classes: 1h

(ENG) RADAR II - The radar system characteristics

(ENG) RADAR III - Target detection

(ENG) RADAR IV - Utilització de l'equip

(ENG) Cinemàtica de radar

(ENG) Introduction to the ARPA system

(ENG) Global satellite positioning and navigation

(ENG) El sistema ECDIS de cartografia electrònica

Description:
(ENG) Sistemes d'informació geogràfica marítima. Sistemes geodèsics i datums
Introducció a la cartografia electrònica. Normativa. Cartes de tipus raster i vectorials. Elaboració, distribució i actualització de cartes
electròniques
El sistema ECDIS de representació d'informació cartogràfica Característiques bàsiques. Fonaments tècnics i legals
Utilització del sistema. Modes de presentació. Funcionalitats bàsiques
Creació i monitorització de rutes mitjançant el sistema ECDIS
Integració amb altres sistemes

(ENG) Sistemes de pont integrat

GRADING SYSTEM

The final rating (Nfinal) is the partial sum of the following qualifications:
Nfinal NPP = 0.4 + 0.4 + 0.2 NPF Nat & L

NPP = partial qualification test.(50% theory + 50% kinematics)
NPF = rating of the final test.(50% theory + 50% kinematics)
Nat & L = rating of continuous assessment (Delivery of kinematic tasks and sailboat trips Barcelona 10% + Simulator practicals 10%)

EXAMINATION RULES.

- The student who does not appear for the partial test and, in addition, does not present any of the continuous assessment activities will be considered not presented
- The student who, having complied with part or all of the above aspects, does not appear for the final test will be considered not presented.
- In the realization of the supplies, the students will only be able to dispose of pens, keys and calculator. For the realization of practical exercises in kinematics, the student has to set up a normalized maneuvering rose

BIBLIOGRAPHY

Basic:
- Jaime Pérez, Ricard; Rodríguez-Martos Dauer, Ricard. Manual del observador de radar. Barcelona: Edicions UPC, 1995. ISBN 8476534930.
- Rodríguez-Martos Dauer, Ricard; Jaime Pérez, Ricard. Manual del operador de arpa. Barcelona: Edicions UPC, 1996. ISBN 8483011212.
- Jaime Pérez, Ricard. Radionavegació. 2a ed. Barcelona: Edicions UPC, 1997. ISBN 8483010895.
- Correia, Paul. Guía práctica del GPS. Barcelona: Marcombo, 2002. ISBN 8426713246.
- Tetley, Laurie; Calcutt, David. Electronic navigation systems. Amsterdam: Elsevier, 2001. ISBN 0750651385.
- Bowditch, Nathaniel. American practical navigator : an epitome of navigation [on line]. Springfield: NationalL Geospatial - Intelligence Agency, 2019 [Consultation: 22/03/2024]. Available on: https://msi.nga.mil/Publications/APN.

Complementary:
- z. Cinemática náutica. Madrid: Colegio Oficial de la Marina Mercante Española, 1994. ISBN 847916039X.
- Bole, A.; Dineley, B.; Wall, A. Radar and ARPA manual. 3rd ed. Oxford: Elsevier Butterworth-Heinemann, 2005. ISBN 9780080977522.
- García Melón, Enrique; Bermejo Díaz, Antonio C.; Perera Marrero, José. El Observador de radar. Madrid: Colegio Oficial de la Marina Mercante Española, 1994. ISBN 8479160209.
- National Imagery and mapping agency. Radar navigation and maneuvering board manual [on line]. 7th ed. Bethesda: National Imagery and mapping agency, 2001 [Consultation: 22/03/2024]. Available on: https://msi.nga.mil/Publications/RNMB.

- Lownsborough, Roger; Calcutt, David. Electronic aids to navigation : radar and ARPA. London: Edward Arnold, 1993. ISBN 0340592583.
- Tetley, L.; Calcutt, David. Electronic aids to navigation : position fixing. 2nd ed. London: Edward Arnold, 1991. ISBN 0340543809.
- Weintrit, Adam. Electronic chart display and information system (ECDIS) : an operational handbook. Boca Raton: CRC Press, 2009. ISBN 9780415482462.