GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2020-2021

Navigation (C004364)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)

Credits	6.0	Study time	180 h	Contact hrs	50.0 h

Course offerings and teaching methods in academic year 2020-2021

A (year)	English	Gent	lecture	47.5 h
			practicum	3.75 h

Lecturers in academic year 2020-2021

Annaert, Axel	WE12	lecturer-in-charge
Sensen, Christophe	103879	co-lecturer

Offered in the following programmes in 2020-2021	crdts	offering
Postgraduate Hydrography B	6	A

Teaching languages

English

Keywords

Position of the course

Contents

NAVIGATION (partim 1)
CHARTS

- Describe the principal types of buoys and beacons, and their roles as aids to navigation
- Explain the function of radio and radar beacons.
- Describe the use of traffic separation schemes
- Explain the relationship of Notice to Mariners to nautical charts and publications, and describe the mariner's responsibility to provide information for inclusion in Notice to Mariners
- Interpret navigational warnings and Notice to Mariners
- Apply Notice to Mariners chart corrections to a nautical chart
- Explain the different uses of the nautical chart
- Classify nautical charts according to scale, objectives, edition, and form (paper - digital)

Describe the content of a nautical chart.

- Differentiate special purpose nautical charts
- Use nautical chart for various applications
- Recognize common charting symbols
- Explain the following components of a nautical chart: datum, projection, scale
- Describe the ENC and ECDIS standards, as well as raster nautical chart standards
- Describe other Electronic Chart Systems (ECS) and formats
- Explain the differences between these electronic charting products
- Describe the ENC production process
- Describe the source and content of sailing directions, light and radio lists, and tide and current tables

COLREG (partim 1)

- explanation of the rules of the road
- recognize which vessel should keep clear of the other vessel, in a variety of meeting, crossing, and overtaking situations
- Recognize the lights and day shapes displayed by common vessel types
- Describe the sound signals required when operating in reduced visibility
- Explain the responsibilities of a vessel operating in reduced visibility

INSTRUMENTS (partim 1)
- Describe the capabilities and limitations of magnetic and gyro compasses
- Explain the sources of magnetic and gyro compass error
- Determine and apply corrections for magnetic and gyro compass error
- basic principles of a sextant and its use
- errors of sextant and sextant observations

NAVIGATION
- comparison of horizontal and equatorial coordinates in order to create the geocentrical sphere (navigation triangle)
- be able to determine a fix (position) by sextant and peloris
- Explain the role of pilots for ships entering port
- Describe the responsibilities of the pilot and the vessel master when a pilot is aboard

MODULE 3

NAVIGATION (partim 2)

COLREG (partim 2)
- case studies of COLREG

INSTRUMENTS (partim 2)
- Explain the basic principles of radar operation, and describe the capabilities and limitations of radar
- Explain the basic principles of ARPA operation, and describe the capabilities and limitations of radar

MANOEUVRES
- Describe the manoeuvring capabilities of single and twin screw ships, as well as ships with bowthrusters and omni directional drive systems
- Explain how tows will handle at varying speeds and with varying amounts of tow line
- Describe the component parts of shipboard ground tackle (anchor, chain, windlass, stoppers, etc.)
- Describe how multiple anchors can be used to position a vessel over a fixed location
- Explain how the final position of the vessel can be adjusted
- Demonstrate the ability to manoeuvre a small boat
- Draw a diagram showing how an anchor should be rigged on a small boat

METEOROLOGY & OCEANOGRAPHY
- Description of the vertical structure of the atmosphere
- Definition of the following parameters and explanation on how they are measured/classified and what their effect on hydrographic operations is: temperature, humidity, dew-point, frost-point, atmospheric pressure, fog, clouds and precipitation, rain, snow, visibility
- Explanation of the relation between atmospheric pressure and winds
- The origin of geostrophic winds and Guy Ballot's law
- Description of wind circulation around pressure systems
- The effect of friction
- Operate instruments and sensors used to register temperatures pressure, direction and intensity of wind
- Identification of characteristics of weather by simple observation of the sea and the sky
- Recording meteorological parameters according to internationally accepted standards
- Synoptic weather charts
- Weather forecast based on synoptic charts
- Definition of salinity, conductivity, temperature, pressure, density and colour
- Description of the relationship between temperature and salinity in relation to depth
- Wind-waves and swell
- Definition of wave parameters
- Explanation of the elements involved in the wave growth process including typical fetches
- Classification of sea state according to Beaufort Scale
- Wave propagation
- Definition and practical examples of refraction, diffraction and reflection
- Explanation of breaking waves and long-shore and rip current processes

Initial competences

Same as to be admitted to higher education.

Final competences

Basic knowledge of all subjects, methodology and their practice. The aim of the course is also to convey to those students with a limited meteorological and oceanographic background as well as an insight in meteorological processes (athmosphere, wind, weather) and oceanographic processes (wind-waves and swell, wind propagation, physical properties of the sea water).

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, practicum

Learning materials and price

- Different compasses
- Ropes and wires
- Small boat
- Small RHIB

References

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- Bowditch, N. (2018). *American Practical Navigator, volume 1 en 2*. Paradise Cay Publications. ISBN: 9781937196820
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- Subramaniam, H. (2001). *Shipborne Radar*. Mumbai, Vijaya Publications.
- Thuman, H., Truhillo, A., (2004). Introductory Oceanography (10th Ed.). London, UK: Pearson Education.

Course content-related study coaching

Evaluation methods

end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period

Oral examination

Examination methods in case of periodic evaluation during the second examination period

Oral examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

not applicable

Calculation of the examination mark