GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2024-2025

Marine Hydrostatics and Stability (E055020)

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

Credits 6.0 **Study time 180 h**

Course offerings in academic year 2024-2025

A (semester 1)	English	Gent
B (semester 1)	Dutch	Gent

Lecturers in academic year 2024-2025

Lataire, Evert	TW15	lecturer-in-charge
Delefortrie, Guillaume	TW15	co-lecturer

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bridging Programme Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	6	A
Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)	6	B
Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)	6	B
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	6	B
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	6	A
Master of Science in Electromechanical Engineering(main subject Mechanical Construction)	6	B
Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)	6	B
International Master of Science in Advanced Design of Sustainable Ships and Offshore Structures	6	A

Teaching languages

English, Dutch

Keywords

Ships, shipping, ship stability in normal and exceptional conditions

Position of the course

Introduction to the maritime world, providing basic information on characteristics, construction, stability, propulsion and motions of ships. Thorough knowledge concerning hydrostatics and stability of floating structures and ships.

Contents

- Shipping as part of the logistics chain.: The role of shipowners, shipyards and classification societies.
- General description of the ship as a means of transport or as an implement.: Function and short description of some ship types: cargo ships, dredgers, tugs,...
- Ship structures: materials and construction systems.
- Hydrostatics and stability of floating structures: background; influence of free liquid surfaces and of hanging loads, applications (e.g. sheer-legs pontoon); IMO regulation (load line, tonnage, stability).
- Hydrostatics of floating structures: damage calculations for ships.
- Hydrostatics of floating structures: contact with bottom.

Initial competences

Specific elements of the mathematics and physics courses from the bachelor's.

Final competences

1 Describe the main players in the shipping world.
2 Get acquainted with professional terminology concerning external characteristics, structure and primary members of maritime constructions.
3 Mastering hydrostatics and stability of floating structures.
4 Analyse the stability of floating structures, including the effects of free fluid surfaces, hanging weights, movable cargo.
5 Assess ship stability with respect to international conventions.
6 Analyse specific problems concerning hydrostatics and stability of ships and other floating structures.
7 Execute hydrostatic calculations and stability calculations for a ship by means of specialised software.
8 Be able to analyse the physical background and the consequences of damage to a ship on hydrostatics and stability. Distinguish the regulatory principles on which the criteria for damaged ships are based.
9 Be able to analyse the effects of supporting contact of a floating structure on the bottom (grounding, docking) on hydrostatics and stability.

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

Seminar, Lecture, Independent work

Extra information on the teaching methods

Lectures, excercises and project about the specific topics of the courses content, with
the possibility of asking questions.
If possible, the lectures are supplemented with visits to relevant research institutions
and companies.

Study material

Type: Syllabus

Name: syllabus of this course
Indicative price: € 20
Optional: no
Language : English
Number of Pages : 300
Oldest Usable Edition : 2024
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

Type: Slides

Name: slides
Indicative price: Free or paid by faculty
Optional: no
Language : English
Number of Slides : 1000
Oldest Usable Edition : 2024
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

Type: Laptop

Name: laptop
Indicative price: € 1,000
Optional: no

Available through Student Association : No
Usability and Lifetime within the Course Unit : regularly
Usability and Lifetime within the Study Programme : regularly
Usability and Lifetime after the Study Programme : regularly

References

- Lewis, E. V., & Society of Naval Architects and Marine Engineers (U.S.). (1988). Principles of naval architecture. Jersey City: Society of Naval Architects and Marine Engineers.
- Mansour, A. E., Liu, D., Paulling, J. R., & Society of Naval Architects and Marine Engineers (U.S.). (2008). Strength of ships and ocean structures. Jersey City, N. J: Society of Naval Architects and Marine Engineers.
- Scheepskennis (K. van Dokkum, Dokmar, Delfzijl 2001)

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

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

Oral assessment, Written assessment open-book

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

Oral assessment, Written assessment open-book

Examination methods in case of permanent assessment

Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

During examination period: oral closed-book exam, written preparation; written open-book exam. During semester: graded project reports.

Calculation of the examination mark

Oral closed-book exam during examination period: 50%
Written open-book exam during examination period: 25%
Project reports during semester: 25%
The student can only pass for the entire course if:
- for each of the above mentioned items a mark of at least 5 on 20 is obtained
- for two of the above mentioned items a mark of at least 10 on 20 is obtained

If the above conditions are not met the final mark is the minimum of 9/20 and the above mentioned weighted result.