GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Ship Behaviour in Shallow and Confined Water (E055320)

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

Credits 3.0 **Study time 90 h**

Course offerings in academic year 2026-2027

A (semester 2)	English	Gent
B (semester 2)	Dutch	Gent

Lecturers in academic year 2026-2027

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

Offered in the following programmes in 2026-2027	**crdts**	**offering**
Bridging Programme Master of Science in Engineering: Ships and Marine Technology	3	A
Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)	3	A
Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)	3	A
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	3	B
Master of Science in Electromechanical Engineering(main subject Maritime Engineering)	3	A
Master of Science in Electromechanical Engineering(main subject Mechanical Construction)	3	A
Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)	3	A
Master of Science in Civil Engineering	3	A
Master of Science in Electromechanical Engineering	3	A
Master of Science in Engineering: Ships and Marine Technology	3	B
Master of Science in Engineering: Ships and Marine Technology	3	A
Master of Science in Mechanical and Electrical Systems Engineering	3	A

Teaching languages

English, Dutch

Keywords

Shipping traffic, ship hydrodynamics, shallow water, confined waters, ports, access channels

Position of the course

Acquire theoretical insight into the behaviour of ships in shallow and confined waters such as access channels, canals and harbours, and introduction to common methods for treating related problems.

Contents

- Introduction: importance of safety and efficiency of shipping traffic in access channels and harbours
- Effect of water depth and blockage on ship resistance and propulsion
- Vertical motions of ships in channels and canals:
  - Squat
  - Response to hydro-meteo
- Steering and manoeuvring in ports and access channels:
  - Effect of water depth and under keel clearance on manoeuvring and steering behaviour
  - Ship-bank interaction

- Ship-ship interaction
- Tug assistance
- Effect of mud layers on ship behaviour
- Lock manoeuvres
- Manoeuvring simulation

- Moored ships:
  - Mooring lines, fenders
  - Forces on moored ships
  - Motions of moored ships
- Channels and fairways: design and access policy:
  - Concept versus detailed design
  - Deterministic versus probabilistic design
  - Tidal windows
  - Nautical bottom approach

Initial competences

Mathematics and physics courses from the bachelor's (required); This course builds on some learning outcomes of:

- OR Introduction to Ships and Marine Technology (if this course was not followed, the learning outcomes should be achieved by self-study).
- OR Hydrodynamic courses from the Maritime Engineering (Marine hydrostatics and stability, Ship resistance and propulsion, Ship manoeuvring and seakeeping). Maritime Engineering students should select this course in their second master year.

Final competences

1 Acquire thorough understanding of phenomena dominating a ship's behaviour in shallow and confined waters (e.g. access channels, canals, harbours) and of common methods appropriate to assess these effects.

2 Perform a concept design for the vertical and horizontal dimensions of a navigation channel by means of common design methods.

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

Excursion, Lecture, Independent work

Study material

Type: Syllabus

Name: Ship Behaviour in Shallow and Confined Water
Indicative price: € 25
Optional: no
Language : English
Number of Pages : 325
Oldest Usable Edition : 2024
Available on Ufora : No
Online Available : No
Available in the Library : No
Available through Student Association : No
Additional information: To be purchased at the Ships and Marine Technology Division

Type: Slides

Name: Ship Behaviour in Shallow and Confined Water
Indicative price: Free or paid by faculty
Optional: no
Language : English
Available on Ufora : Yes
Online Available : No
Available in the Library : No
Available through Student Association : No

Type: Excursion

Name: KGT Trip
Indicative price: Free or paid by faculty
Optional: no

Type: Project

Name: project information
Indicative price: Free or paid by faculty
Optional: no

References

www.shallowwater.be

Course content-related study coaching

Lecturers are available before/after lessons and on request.

Assessment moments

end-of-term and continuous assessment

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

Oral assessment open-book

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

Oral 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: presentation of the project report (oral open book exam). During semester: graded project reports.
The project report has to be delivered by May 15 (for the first session) or August 15 (for the second session).A point is deducted from the project report mark per 24h delay without valid reason (medical certificate). The minimal mark is 0/20.

Calculation of the examination mark

Project report: 40%
Excursion: 10% report DFDS trip
Oral open book exam: defense of the project report: 50%
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.