

## 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 and teaching methods in academic year 2024-2025**

A (semester 2)	English	Gent	lecture excursion
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**Lecturers in academic year 2024-2025**

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

**Offered in the following programmes in 2024-2025**

	<b>crdts</b>	<b>offering</b>
<a href="#">Master of Science in Electromechanical Engineering(main subject Control Engineering and Automation)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Electrical Power Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Maritime Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Construction)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering(main subject Mechanical Energy Engineering)</a>	3	A
<a href="#">Master of Science in Civil Engineering</a>	3	A

**Teaching languages**

English

**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 : Yes

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](http://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.