

# Course Specifications

Valid in the academic year 2024-2025

# **Offshore Structures (E044666)**

Course size	(nominal v	alues; actual	values may depend on programme)		
Credits 4.0		Study time 120 h			
Course offerings	and teaching metho	ods in acadeı	mic year 2024-2025		
A (semester	2) E	nglish	Gent		
B (semester	2) E	nglish	Gent se	minar	
			gr	oup work	
			le	cture	
Lecturers in acad	emic year 2024-202	25			
Kortenhaus	Andreas		TW15	lecturer-in-	charge
Offered in the following programmes in 2024-2025				crdts	offering
International Master of Science in Advanced Design of Sustainable Ships and Offshore				3	В
Structures Master of So	ience in Civil Engine	ering		4	А
Teaching languag	es				
English					

#### Keywords

Offshore structures

# Position of the course

The goal of the course is allowing students to gain insight in all relevant engineering aspects of offshore techniques construction.

#### Contents

- Overview of offshore construction.
- Gravity structures, jacket construction, monopiles, ....
- Hydraulic forces (waves and currents) on offshore structures with clear distinction between singular structures (e.g. monopiles) and jacket structures.
- Offshore wind energy
- Ocean energy, mainly tidal- and wave energy (only for the version of 4 ECTS)
- Financial viability of offshore installations (only for the version of 4 ECTS)

#### Initial competences

Coastal engineering and Harbour construction, Geotechnics, Hydraulics

# **Final competences**

- 1 CONCEPTS: design of offshore structures; wave forces on piles; scour; offshore wind energy; renewable energy
- 2 INSIGHTS: distinction between breaking and non-breaking waves w.r.t. wave loading on piles; insight in potential and problems related to offshore constructions; renewable energies
- 3 SKILLS: design of offshore structures

#### 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**

#### Study material

#### Type: Slides

Name: Lectures (PDF) Indicative price: Free or paid by faculty Optional: no Language : English Number of Slides : 500 Available on Ufora : Yes Online Available : Yes Available in the Library : No Available through Student Association : No

# References

- Boyle, G. (2004): Renewable Energy Power for a sustainable future. Oxford, U. K.: Oxford University Press, 2nd edition, 452 p.
- EWEA (2013): Deep water The next step for offshore wind energy. The European Wind Energy Association, 50 p.
- Journée, J.M.J.; Massie, W.W. (2001): Offshore hydromechanics. Delft University of Technology, 530 p.
- Kortenhaus, A.; Vanneste, D. (2013): Wave forces on slender cylindrical piles. Department of Civil Engineering, Lecture Notes for 'Offshore Structures', Ghent, Belgium, 26 p.
- Lykke Andersen, T.; Frigaard, P. (2007): Lecture notes for the course in 'Water wave mechanics'. Department of Civil Engineering, DCE Lecture Notes No. 16, Aalborg, Denmark, 111 p.
- Rabaut, D. (2013): Strucural design of offshore steel structures: self-elevating units. DEME Dredging, Environmental & Marine Engineering, Lecture Notes, Offshore Structures, Ghent University, Version 1.02, 47 p.
- Van der Tempel, J. (2006): Design of support structures for offshore wind turbines. Ph.D. thesis, *Delft University of Technology*, Delft, The Netherlands, 194 p.
- Vannuci, D. (2011): ORECCA project: Technologies state of the art. 120 p.

# Course content-related study coaching

The teaching staff is available to the students before and after the scheduled courses and via email.

#### 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

Periodic evaluation (during examination period): oral open-book exam, written preparation.

Non-periodic evaluation (before examination period): evaluation of report on project assignments. Students submit the report before the start of the periodic evaluations, according to the terms announced during the lectures and via the electronic learning platform.

If not submitted the report in time, without a valid and timely communicated reason for it, then the student will receive a 0 for the non-periodical evaluation. For the non-periodic evaluation, a second chance is only possible in modified form, if less than 10 in 20 was achieved.

## Calculation of the examination mark

The periodic evaluation (oral exam) counts for 60% of the total, the non-periodic evaluation (project work) counts for 40% of the total. If for one of both evaluations (exam or project work) less than 10 (in 20) is scored, then this part is counted for 70% and the other part for 30%.