

Programme jointly offered by Ghent University, University of Rostock, "Dunarea de Jos" University of Galati, École centrale de Nantes, Polytechnical University of Madrid, University of Liège, University of Lisboa

International Master of Science in Advanced Design of Sustainable Ships and Offshore Structures

Language of instruction: English

(Programme sheet as of: 2024)

Programme version 1

Valid as from the academic year 2024-2025 (ONTWERP)

1 General Courses

60 credits

The student takes the general courses at one of the universities mentioned below, in accordance with the mobility scheme as approved by the Steering Committee.

The first year is offered by Universiteit Gent (Belgium) and Dunarea de Jos University of Galati (UDJG, Roemenië).

More information: <https://www.emship.eu>

1.1 General Courses Ghent University

60.0 credits

The first master's year at Ghent University, in accordance with the mobility scheme as approved by the Steering Committee:

- 54 ECTS general courses
- 6 ECTS elective courses

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E044311 Structural Stability	3		1		C:1	90
2	E045280 Computational Fluid Dynamics	3		1		A:1	90
3	E900069 Composites	6		1		A:1	180
4	E055020 Marine Hydrostatics and Stability	6		1		A:1	180
5	E055060 Ship Manoeuvring and Seakeeping Behaviour of Floating Structures	6		1		A:1	180
6	E056600 Construction Techniques	3		1		B:2	90
7	E040670 Mechanical Vibrations	6		1		B:2	180
8	E044666 Offshore Structures	3		1		B:2	90
9	E055070 Ship and Marine Structures	6		1		A:2	180
10	E055080 Ship Resistance and Propulsion	6		1		A:2	180
11	E055090 Ship Design Project	6		1		A:J	180

1.1.1 Elective Course Ghent University

6.0 credits

Subscribe to 6 credit units from the following list. Subject to approval by the faculty.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E076221 Manufacturing Planning and Control	6				A:1	180
2	E076951 Engineering Economy	6				A:1	180
3	E076820 Project Management	6				A:2	180
4	E076431 Introduction to Entrepreneurship	3				A:1	90
5	F000892 Innovation Management	3				A:2	90

1.2 General Courses "Dunarea de Jos" University of Galati

60.0 credits

The first master's year at Dunarea de Jos University of Galati (UDJG, Roemenië), in accordance with the mobility scheme as approved by the Steering Committee:

- 44 ECTS general courses
- 12 ECTS general courses according to background in naval architecture
- 4 ECTS elective courses

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900844 Ship Structural Analysis and Design "Dunarea de Jos" University of Galati	5		1		A:1	150
2	E900845 Computational Fluid Dynamics I "Dunarea de Jos" University of Galati	4		1		A:1	120

3	E900846	Advanced Shipbuilding Technology "Dunarea de Jos" University of Galati	4	1	A:1	120
4	E900847	Analysis of Noise and Vibration "Dunarea de Jos" University of Galati	5	1	A:1	150
5	E900822	Complements in Propulsion Dynamics "Dunarea de Jos" University of Galati	5	1	A:2	150
6	E900823	Offshore Units and Systems "Dunarea de Jos" University of Galati	5	1	A:2	150
7	E900824	Structural Analysis and Hydroelasticity "Dunarea de Jos" University of Galati	5	1	A:2	150
8	E900826	Computational Fluid Dynamics II "Dunarea de Jos" University of Galati	4	1	A:2	120
9	E900825	Ship Design Project II "Dunarea de Jos" University of Galati	7	1	A:2	210

1.2.1 General Courses Naval Architecture "Dunarea de Jos" University of Galati 12.0 credits

Subscribe to 12 credit units from the following list. Subject to approval by the faculty.

- Students with a background in naval architecture: take the courses with reference a.
- Students without a background in naval architecture: take the courses with reference b.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900849 Composite Structure in Naval Architecture "Dunarea de Jos" University of Galati	5	a	1		A:1	150
2	E900848 Ship Design Project I "Dunarea de Jos" University of Galati	7	a	1		A:1	210
3	E900850 Seakeeping "Dunarea de Jos" University of Galati	5	b	1		A:1	150
4	E900851 Ship Hydrostatics and Stability "Dunarea de Jos" University of Galati	4	b	1		A:1	120
5	E900852 Ship Resistance "Dunarea de Jos" University of Galati	3	b	1		A:1	90

1.2.2 Elective Courses "Dunarea de Jos" University of Galati 4.0 credits

Subscribe to 4 credit units from the following list. Subject to approval by the faculty.

- Students with a background in naval architecture: choose a course with reference a.
- Students without a background in naval architecture: choose a course with reference b.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900828 Project Management "Dunarea de Jos" University of Galati	4	a	1		A:2	120
2	E900829 The Marine Environmental Protection Technologies "Dunarea de Jos" University of Galati	4	a	1		A:2	120
3	E900830 Ship Commissioning "Dunarea de Jos" University of Galati	4	a	1		A:2	120
4	E900827 Ship Manoeuvring "Dunarea de Jos" University of Galati	4	b	1		A:2	120

2 General Courses 30 credits

The student takes 30 ECTS in the second master's year at one of the universities mentioned below, in accordance with the mobility scheme as approved by the Steering Committee.

The second year is offered by University of Liège (ULiège, Belgium), Ecole Centrale de Nantes (ECN, France), University of Rostock (URO, Germany), Universidad Politécnica de Madrid (UPM, Spain) and Instituto Superior Técnico (IST, Portugal).

More information: <https://www.emship.eu>

2.1 General Courses Universidad Politécnica de Madrid 30.0 credits

The courses in the second master's year at Universidad Politécnica de Madrid (UPM, Spain) focus on Offshore Wind and Renewable Marine Energy.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900801 Oceanology Universidad Politecnica de Madrid	1.5		2		A:1	45
2	E900802 Structural Design Universidad Politecnica de Madrid	8		2		A:1	240
3	E900803 Electric Generation and Export Technologies Universidad Politecnica de Madrid	5.5		2		A:1	165

4	E900804	Manufacturing and Marine Operations Universidad Politecnica de Madrid	7	2	A:1	210
5	E900805	Project Operation and Management Universidad Politecnica de Madrid	4	2	A:1	120
6	E900806	Structural Analysis of Offshore Platforms Universidad Politecnica de Madrid	4	2	A:1	120

2.2 General Courses University of Rostock

30.0 credits

The courses in the second master's year at University of Rostock (URO, Germany) focus on Ship Technology and Ocean Engineering.

Students take:

- 6 ECTS general courses
- 24 ECTS elective courses

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900814 Team Project University of Rostock	6		2		A:1	180

2.2.1 Elective Courses University of Rostock

24.0 credits

Subscribe to 24 credit units from the following list. Subject to approval by the faculty.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900807 Design of Offshore Systems University of Rostock	6		2		A:1	180
2	E900808 Selected Topics for the Analysis of Marine Structures University of Rostock	6		2		A:1	180
3	E900809 Mathematical Models in Ship Theory University of Rostock	6		2		A:1	180
4	E900810 Ship Life Cycle Digitalization University of Rostock	6		2		A:1	180
5	E900811 Safety of Maritime Systems University of Rostock	6		2		A:1	180
6	E900812 Ocean Research Technologies University of Rostock	6		2		A:1	180
7	E900813 Large Engines, Energy Converters and Fuels for Climate Neutral Marine Applications University of Rostock	6		2		A:1	180

2.3 General Courses Ecole Centrale de Nantes

30.0 credits

The courses in the second master's year at Ecole Centrale de Nantes (ECN, France) focus on Hydrodynamics for Ocean Engineering.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900815 General Concepts of Hydrodynamics École centrale de Nantes	4		2		A:1	120
2	E900816 Water Waves and Sea State Modelling École centrale de Nantes	4		2		A:1	120
3	E900817 Wave-Structure Interactions and Moorings École centrale de Nantes	5		2		A:1	150
4	E900818 Numerical Hydrodynamics École centrale de Nantes	5		2		A:1	150
5	E900819 Experimental Hydrodynamics École centrale de Nantes	5		2		A:1	150
6	E900820 Naval Engineering École centrale de Nantes	5		2		A:1	150
7	E900821 Modern Languages École centrale de Nantes	2		2		A:1	60

2.4 General Courses University of Liège

30.0 credits

The courses in the second master's year at University of Liège (ULiège, Belgium) focus on Offshore Structures and Digital Twin.

Students take:

- 15 ECTS general courses
- 15 ECTS elective courses

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900831 Technology of Offshore Wind Structures Université de Liège	5		2		A:1	150
2	E900832 Structural Health Monitoring for Offshore Structures Université de Liège	5		2		A:1	150

3	E900833	Digital Twins and Operations of Marine Structures Université de Liège	5	2	A:1	150
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2.4.1 Elective Courses University of Liège 15.0 credits

Subscribe to 15 credit units from the following list. Subject to approval by the faculty.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900834 Reliability and Stochastic Modelling Université de Liège	5		2		A:1	150
2	E900835 Structural and Multi-disciplinary Optimization Université de Liège	5		2		A:1	150
3	E900836 Mechanics of Composites (of Marine Structures) Université de Liège	5		2		A:1	150
4	E900837 Fracture Mechanics, Damage and Fatigue Université de Liège	5		2		A:1	150
5	E900838 Vibration Testing and Experimental Modal Analysis Université de Liège	5		2		A:1	150

2.5 General Courses Instituto Superior Técnico 30.0 credits

The courses in the second master's year at Instituto Superior Técnico (IST, Portugal) focus on Safety and Logistics of Maritime Transportation.

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E900839 Ports Organization and Management Instituto Superior Técnico	6		2		A:1	180
2	E900840 Ship and Ocean Systems Design Instituto Superior Técnico	6		2		A:1	180
3	E900841 Maritime Transportation and Ports Instituto Superior Técnico	6		2		A:1	180
4	E900842 Modelling and Safety of Maritime Traffic Instituto Superior Técnico	6		2		A:1	180
5	E900843 Integrated Project in Naval Architecture and Ocean Engineering Instituto Superior Técnico	6		2		A:1	180

3 Master's Dissertation 30 credits

Nr	Course	CRDT	Ref	MT1	MT2	Session	Study
1	E091105 Master's Dissertation	30				A:J	900

Teaching languages

When a course is not taught (solely) in the programme's language of instruction, the effectively used languages are indicated in square brackets following the course name, using the following ISO codes:

bg: Bulgarian	de: German	es: Spanish	ja: Japanese	pl: Polish	sh: Croatian/Serbian	zh: Chinese
cs: Czech	el: Greek	fr: French	nl: Dutch	pt: Portuguese	sl: Slovene	
da: Danish	en: English	it: Italian	no: Norwegian	ru: Russian	sv: Swedish	

Semester

Semesters are indicated by their number (1 or 2); semester 3 represents the summer period and J indicates a course spanning semesters 1 and 2. When a capital letter precedes a semester number, the course has multiple offerings. The letter indicates the offering concerned.

When a semester is shown in brackets, the course is not offered this year in the specific offering.

The offering frequency and first year of offering are indicated by the following codes:

a: bi-annually	c: annually, from 2025-2026	f: annually, from 2026-2027	i: annually, from 2027-2028
b: tri-annually	d: bi-annually, from 2025-2026	g: bi-annually, from 2026-2027	j: bi-annually, from 2027-2028
	e: tri-annually, from 2025-2026	h: tri-annually, from 2026-2027	k: tri-annually, from 2027-2028