

# Offshore & Dredging Engineering

## MSc Programme



Offshore and Dredging Engineering comprises the design and operation of semi stationary floating systems in a marine environment, with the purpose of exploring, exploiting, generating, storing and transporting/lifting (valuable) materials, like hydrocarbons, minerals and rare metals. ODE also deals with auxiliary systems and equipment for the construction, placement and decommissioning of these systems.

Degree	Master of Science in Offshore & Dredging Engineering
Starts	September
Credits	120 ECTS, 24 months
Language	English
Application deadline	April 1st: international students July 1st: Dutch degree
Scholarships	<a href="https://www.scholarships.tudelft.nl">scholarships.tudelft.nl</a>

### Programme

Offshore & Dredging Engineering is a multidisciplinary programme offered by the Faculty of Mechanical, Maritime and Materials Engineering and the Faculty of Civil Engineering & Geosciences. As a participant in the programme, you will pursue both theoretical and applied studies, including a multidisciplinary project and your final thesis project.

### Specialisations

#### **Floating Offshore Structures**

In extremely deep waters, the only practical choice of structure is a floating structure. Floating structures are also favoured when the activity in a particular location will be temporary.

Many forms of floating structures have been developed over the years, including ship-like forms when speed is important, and semisubmersible or spar platforms, when greater stability is an important factor. The Floating Structures – Offshore Hydromechanics specialization includes courses in Floating Structures, Drive Systems Design Principles, Offshore Moorings and Dynamic Positioning.

#### **Dredging Engineering, Trenching & Deepsea Mining**

Dredging Engineering focuses on the design and maintenance of dredging equipment with the goal of durable implementation of dredging projects. The sea-mining industry is also

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First Year	Second Year
Introduction to Offshore Engineering (3ECTS)	Survey of Offshore Engineering Project OR Research Exercise* (6ECTS)
Introduction to Dredging Engineering (3ECTS)	Problem Analysis Thesis (15ECTS)
Introduction to Ship and Offshore Hydromechanics (3ECTS)	Thesis (30ECTS)
Motions & Loading of Structures in Waves (5ECTS)	
Probabilistic Design (4ECTS)	
Ocean Waves (6ECTS)	

\* In the second year of the programme, students will be given the choice of taking either the surveying project, or to do a research exercise. The surveying project is to be done in large groups of students, whereas the research exercise is to be done individually. This research exercise has been introduced to allow students to pursue an internship abroad.

moving to deeper and deeper waters. Although operation depths do not currently exceed 150m, it is expected that within 10 years dredging and sea-mining will reach 500m to 3000m, requiring new technologies for resource recovery, as well as monitoring and control systems. Dredging Engineering includes courses in Dredging Processes I & II and Pumps & Slurry Transport.

### Bottom Founded Structures

Fixed, Bottom-Founded Structures include fixed towers with piled foundations, as well as jack-up structures and monopole structures commonly used for offshore wind energy applications. The dynamics of floating & fixed structures and arctic engineering become more and more important. Developing designs for cost effectiveness over the entire life cycle of the structure is a priority addressed in the programme. Courses offered in this specialization include Bottom Founded Structures, Structural Dynamics, Finite Element Methods and Offshore Soil Mechanics. Students in this track are eligible for the European Wind Energy Master.

### Structural Design & Analysis

Structural Design and Analysis is the youngest specialization focusing on mastering and advancing your knowledge when applied for design and analysis of steel and composite floating structures used by the maritime, offshore, dredging and renewable energy industries. Think here about floating wind structures, tidal energy structures, "Pioneering Spirit" of Allseas,

"Prelude" an FLNG of Shell, or the "Sleipnir" a new generation semisubmersible largest crane vessel in the world which is designed for worldwide offshore heavy lifting by HMC. But before these structures can be designed and analysed a lot of new knowledge is needed.

### Thesis opportunities

Within each specialisation, there is the opportunity to conclude the master with a thesis in more subject areas than the specialisations alone. As of 2018 it is possible to choose a topic within Ocean Energy Technology. Ocean Energy Technology considers the generation of energy by waves, thermal gradients, tides or aquatic biomass. It is expected that Ocean Energy will be a large energy source in the coming future. The thesis opportunities within the Offshore & Dredging Engineering master are in abundance. Feel free to approach the professors to ask them for more information.

### Career prospects

The MSc programme Offshore & Dredging Engineering in its current setting is unique in the world, due to the availability of a broad range of offshore and dredging companies and research institutes especially in the Netherlands. Some of the companies offering opportunities to graduates of the programme includes Shell, BP, Heerema, Allseas, Bluewater, SBM, Gusto, Damen, Huisman, Boskalis Dredging, IHC, and van Oord Dredging.

 **25%**  
international students

### Career perspective

 **95%**  
graduates within a company

 **95%**  
has a job within 3 months