

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 hydro-carbons, 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	scholarships.tudelft.nl

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.

Specializations

Offshore Renewable Energy

Offshore renewable energy plays a significant role in contributing to the energy transition. The ocean offers a vast and untapped potential for energy generation from the marine environment

- including offshore wind, tidal, wave, floating solar and ocean thermal energy. Technological advances and innovation are required to reduce lifetime costs of the energy generated and raise the competitiveness of ocean energy technologies with respect to traditional fossil fuel solutions. This specialization includes courses in Offshore Wind Farm Design, Offshore Wind Support Structures and Drive & Energy Systems.

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

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First Year	Second Year
Introduction to Offshore Engineering (3ECTS)	Problem Analysis Thesis (10ECTS)
Introduction to Dredging Engineering (3ECTS)	Thesis (35ECTS)
Introduction to Ship and Offshore Hydromechanics (3ECTS)	
Motions & Loading of Structures in Waves (5ECTS)	
Probabilistic Design (4ECTS) OR Ultimate Strength of Marine Structures (5ECTS)	
Ocean Waves (6ECTS)	
Research Exercise (6ECTS) OR Offshore Renewable Energy (6ECTS)	
MANDATORY ELECTIVE (choose minimum 3 ECTS and maximum 6 ECTS)	
Ethics and Engineering (3ECTS), Philosophy of engineering science and design (3ECTS), Ethics of Transportation (3ECTS), Ethics of Technological Risks (3ECTS), Climate Ethics (3ECTS), Water Ethics (3ECTS)	

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. This 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 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

Bottom-Founded Structures include fixed towers with piled foundations, as well as jack-up structures and monopile 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 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 focuses 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 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. Before these structures can be designed and analysed a lot of new knowledge is needed.

Thesis opportunities

Within each specialization, there is the opportunity to conclude the master with a thesis in more subject areas than the specializations alone. The thesis opportunities within the Offshore & Dredging Engineering master are in abundance. Feel free to ask the professors for more information.

Career prospects

This MSc programme 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.



Career perspective

