Werktuigbouwkunde 3TU OW 2012

Offshore and Dredging Engineering,
Master's Programme
Delft University of Technology

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This report was finalized on 30 November 2012.

Report on the master's programme Offshore & Dredging Engineering of Delft University of Technology

This report takes the NVAO's Assessment Framework for Limited Programme Assessments as a starting point.

Administrative data regarding the programme

Master's programme Offshore & Dredging Engineering

Name of the programme:	Offshore & Dredging Engineering
CROHO number:	60178
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specializations or tracks:	Bottom Founded Structures, Floating Structures, Ship & Offshore Structures, Dredging Engineering;
Location(s):	Delft
Mode(s) of study:	full time
Expiration of accreditation:	31-12-2013

The visit of the assessment committee Werktuigbouwkunde 3TU OW 2012 to the Faculty Mechanical, Maritime and Materials Engineering of Delft University of Technology took place on 20 and 21 September 2012.

Administrative data regarding the institution

Name of the institution:	Delft University of Technology
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	positive

Quantitative data regarding the programme

The required quantitative data regarding the programme are included in Appendix 5.

Composition of the assessment committee

The committee that assessed the master's programme Offshore & Dredging Engineering consisted of:

- Prof. dr. J.K.M. de Schutter, professor in Mechanical Engineering, KU Leuven, Belgium;
- Prof. dr. ir. M. Vantorre, professor in Martime Technology, Ghent University, Belgium;
- Prof. dr. ir. P. Van Houtte, professor in Material Sciences, KU Leuven, Belgium;
- Ir. G. Calis, Chairman Division of Mechanical Engineers of the Royal Institute of Engineers in the Netherlands, former manager of Stork group of companies;

- Ir. H. Grunefeld, Department of Training and Consultancy, Centre for Education and Learning, University Utrecht;
- E.M. Porte, master student Mechanical Engineering, University Twente.

The committee was supported by Dr. B.M. van Balen, who acted as secretary.

Appendix 1 contains the curricula vitae of the members of the committee.

Working method of the assessment committee

Preparation

The assessment of the master's programme Offshore & Dredging Engineering of Delft University of Technology is part of a cluster assessment of ten Mechanical engineering degree programmes offered by three universities. The kick off meeting for the cluster assessment was scheduled on 4 September 2012. During this meeting the committee members received an introduction into the assessment framework and evaluation procedures and the committee agreed upon its general working method. For each visit a subcommittee was composed that ensures the necessary expertise to evaluate the programme. Furthermore the domain-specific requirements and the most recent developments concerning the Mechanical Engineering domain were discussed. These domain-specific requirements and the actual context form the starting point for the evaluation of the quality of the degree programmes.

In preparation of the assessment of the programme a self-assessment report was prepared by the programme management. This report was sent to QANU and, after a check by the secretary of the committee to ensure that the information provided was complete, forwarded to the committee members. The committee prepared the site visit by studying the self-assessment report and a number of master's theses. The secretary of the committee selected 22 master's theses randomly out of a list of all graduates of the last two years for the four TU Delft master's programmes included in this cluster evaluation. The following stratification is used: one third of the theses for each degree programme with low grades (6-6.5), one third of the theses with middle ranged grades (7-8) and one third of the theses with high grades. QANU asked the programmes to send the theses including the assessment by the supervisor and examiner and divided them among the subcommittee members.

When a committee member would have assessed a thesis as questionable or unsatisfactory by a committee member, a reassessment would have been done by another committee member. In the case that more than 10% of the theses were assessed as questionable or unsatisfactory by two committee members the selection of theses should have been extended to 30. This was not the case.

Site visit
The Committee members formulated questions after studying the self-assessment report. These questions were circulated in the committee.

The Committee visited the programme on 20-21 September 2012. The programme of the site visit was developed by the Committee's secretary in consultation with the programme management and the chair of the Committee. The Committee interviewed, besides students, teachers and alumni, the programme management and representatives of the Faculty Board,

the Examination Board and the student and teacher members of the Education Committee. An open office hour was scheduled and announced (but not used).

During the site visit the Committee studied additional material made available by the programme management. Appendix 7 gives an overview of all documents available during the site visit. The last hours of the site visit have been used by the Committee to establish the assessments of the programme and to prepare the oral presentation of the preliminary findings of the Committee to the representatives of the programme.

Report
The secretary wrote a draft report based on the findings of the committee. The draft report was amended and detailed by the committee members. After approval of the draft report by the committee, it was sent to the Department for a check on facts. The comments by the Department were discussed in the committee. This discussion resulted in some changes in the report. Subsequently the committee established the final report.

The assessment was performed according to the NVAO (Accreditation Organization of the Netherlands and Flanders) framework for limited programme assessment (as of 22 November 2011). In this framework a four-point scale is prescribed for both the general assessment and assessment of each of the three standards. The committee used the following definitions for the assessment of both the standards and the programme as a whole.

Decision rules
In accordance with the NVAO's Assessment Framework for Limited Programme Assessments (as of 22 November 2011), the committee used the following definitions for the assessment of both the standards and the programme as a whole.

Generic quality
The quality that can reasonably be expected in an international perspective from a higher education bachelor's or master's programme.

Unsatisfactory
The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory
The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good
The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent
The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

General Assessment

When standard 1 or standard 3 is assessed as 'unsatisfactory', the general assessment of a programme is 'unsatisfactory'.

The general assessment of the programme can be good when at least two standards, including standard 3, are assessed as 'good',

The general assessment of the programme can be excellent when at least two standards, including standard 3, are assessed as 'excellent'.

Summary judgement

Standard 1
Offshore & Dredging Engineering concerns the systematic and responsible application of science and other organized knowledge for practical purposes, where the applications

1. are situated at sea away from the coast, and
2. are centered at a more or less localized area on, in, or under the sea, and where these applications deal with man-made structures (hardware) that
3. by design and method of construction are strongly influenced by the environmental conditions at the intended location, while accepting the natural circumstances and the state of the environment at the location as given facts, and
4. serve for the exploitation of natural resources above, on, in or under the sea or for the support of a public utility.

The programme is a co-operation between the Faculty of Civil Engineering and the Faculty of Mechanical, Maritime and Materials Engineering (3mE).

The master's programme Offshore and Dredging Engineering has the ambition to provide students with a profound educational basis, allowing them to find excellent job positions after their graduation, either in business or in academia. The committee established that the international standards for the master's level are reflected in the intended learning outcomes. The intended learning outcomes are transparent and in line with the ambitions of the programme.

Standard 2
The first year of the master's programme consists of a core curriculum of about 27 EC courses. Students also have to carry out a project of 8 EC, either a field development project or an experimental exercise. The specialisations require compulsory courses of 15-17 EC. The first year is completed with elective courses.

The second year consists of an internship of 15 EC and the graduation project of 45 EC. The core curriculum is a combination of courses offered by the Faculty Civil Engineering and by the Faculty 3mE.

The programme offers four specialisations:

1. Bottom Founded Structures
2. Floating Structures
3. Ship & Offshore Structures
4. Dredging Engineering

The committee studied the content of the core curriculum and concludes that this provides the knowledge and skills students with different backgrounds need to be able to make a choice for a specialisation as well as to be able to do an internship and a research project in the second master's year.

The quantity and the quality of the teaching staff are adequate. Quality assurance on programme level is functioning adequately. The experimental facilities, like model basins, the dredging engineering lab and the cavitation tunnel are excellent. The committee appreciates that these facilities are used in teaching and are available for students. The facilities contribute to the quality of the programme.

Standard 3
The committee has looked into the assessment system and the master's theses in order to assess whether the intended learning outcomes are achieved. The committee is convinced that the assessment system is sufficiently valid and reliable. The committee has established that the Board of Examiners is in control and has made a start with the implementation of an updated, adapted to renewed legislation, test policy and with achieving uniformity of the Master's theses assessment forms.

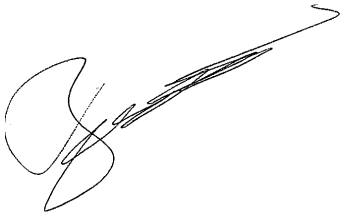
The theses are at the required level of an academic Master's programme. Master's graduates have a good foundation for a career in industry as well as in research.

The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

Standard 1: Intended learning outcomes	good
Standard 2: Teaching-learning environment	satisfactory
Standard 3: Assessment and achieved learning outcomes	good
General conclusion	good

The chair and the secretary of the committee hereby declare that all members of the committee have studied this report and agree with the judgements laid down in the report. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 30 November 2012



Prof. dr. J.K. De Schutter

Dr. B.M. van Balen

Description of the standards from the Assessment framework for limited programme assessments

The Master's programme Offshore and Dredging Engineering is offered by the Faculty Mechanical, Maritime and Materials Engineering (3mE) of Delft University of Technology. Besides this programme the Faculty 3mE also offers a Bachelor's and a Master's programme Mechanical Engineering and a Bachelor's and a Master's programme Marine Technology as well as four specific Master's programmes. The Mechanical Engineering and Marine Technology programmes and the Master's programme Materials Science and Engineering are also assessed in this cluster evaluation. The assessments of these programmes are reported separately.

In 2003, three groups from the Faculties of 3mE and Civil Engineering decided to establish a Master's programme in Offshore Engineering. The programme Offshore Engineering started in 2004 with a first inflow of about 15 students per year. A few years after the programme was established it was decided to move the administration from the Faculty Civil Engineering to the Faculty 3mE and the name of the MSc programme was changed from Offshore Engineering to Offshore & Dredging Engineering (ODE). The last accreditation and self-assessment was carried out in 2006 together with the accreditation of the Civil Engineering programmes. The programme ODE has its own Board of Studies (3mE/CiTG), which advises the Dean, the Director of Education and the Director of Studies on the contents and the structure of de educational programme and the examinations.

Throughout the report, the findings have been extracted from the self evaluation report, the interviews during the site visit and additional documentation provided by the programme management, unless mentioned otherwise.

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:
As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

1. Findings

This section contains the committee's assessment on the profile and orientation of the Master's programme (1.1), the domain-specific framework of reference (1.2) and the intended learning outcomes (1.3).

1.1. Profile and orientation of the programme

Offshore & Dredging engineering concerns the systematic and responsible application of science and other organized knowledge for practical purposes, where the applications

1. are situated at sea away from the coast, and
2. are centered at a more or less localized area on, in, or under the sea, and where these applications deal with man-made structures (hardware) that

3. by design and method of construction are strongly influenced by the environmental conditions at the intended location, while accepting the natural circumstances and the state of the environment at the location as given facts, and
4. serve for the exploitation of natural resources above, on, in or under the sea or for the support of a public utility.

These features are believed to be characteristic and exclusive; they distinguish Offshore & Dredging engineering from other fields of engineering.

The goal of the programme is modeling and controlling the interaction between the Offshore and Dredging Engineering systems on one hand and the elements (wind, water, waves, current and the seabed) on the other hand, with the aim to:

1. Establish physical models by carrying out fundamental research into the physics of the processes involved.
2. Develop algorithms (mathematical models) to predict the interaction between the elements (the environment) and the systems (the objects).
3. Develop new concepts for Offshore and Dredging Engineering systems, especially control systems, based on the physical behaviour.

1.2. Domain-specific framework of reference

As there is no other master's programme Offshore and Dredging engineering programme elsewhere in the world, it is difficult to compare the programme. Therefore the programme has defined its own domain-specific framework of reference, central problem statement and goal. (See Appendix 2).

Offshore & Dredging Engineering comprises the design and operation of semi-stationary floating systems in a marine environment, with the purpose of exploring, exploiting, storing and transporting/lifting (valuable) materials, like hydrocarbons, minerals and rare metals. ODE also deals with auxiliary systems and equipment for the construction and placement of these systems, for decommissioning, including autonomous and remotely operated vehicles. Offshore & Dredging Engineering has a strong inter-disciplinary character based on marine, mechanical and civil engineering, with extended use of control engineering, electronics, telematics and informatics.

To be able to understand and control the processes involved and to ensure the quality, safety and reliability of Offshore and Dredging engineering systems, thorough knowledge of the physical processes; solid mechanics, fluid mechanics (multi-phase flow), hydromechanics, soil mechanics, drilling and cutting mechanics is indispensable.

A second framework of reference is the general definition of engineering by the American Engineers' Council for Professional Development (ABET): the creative application of scientific principles to design or develop structures, machines, apparatuses or manufacturing processes, or works utilizing them singly or in combination, or to construct or operate the same with full recognizance of their design; or to forecast their behaviour under specific conditions; all with respect to an intended function, the economics of operation and safety to life and property.

ABET also provides the following criteria which apply to engineering programs including "ocean" and similar modifiers in their titles: 'The curriculum must prepare graduates to have the knowledge and the skills to apply the principles of fluid and solid mechanics, dynamics,

hydrostatics, probability and applied statistics, oceanography, water waves, and underwater acoustics to engineering problems and to work in groups to perform engineering design at the system level, integrating multiple technical areas and addressing design optimization.

The domain description provided by the programme, in combination with the general definition of engineering by ABET gives, according to the committee, an adequate frame for the goals and the intended learning outcomes of the Master's programme.

The committee appreciates the Professional Review Committee, which meets twice a year, but recommends to make better use of this platform to collect feedback on the intended learning outcomes of the programme and the quality of the graduates in a more structured way.

1.3. Intended learning outcomes

The final qualifications of the Master's Programme ODE are included in Appendix 3.
Graduates from the Master's programme:

- are qualified to independently solve technological problems such as performing research and/or designing innovative systems, equipment or other solutions;
- have a systematic scientific approach to analyse and solve problems;
- are able to evaluate and judge acquired information and literature critically;
- have mastered logical argumentation, analytical and critical thinking;
- are able to maintain and increase their capabilities by keeping track of developments in science and technology independently;
- are able to cooperate with other disciplines as well as in teams;
- can reflect on their work, on technology and science in the context of the economy, on sustainability and on social well-being;
- are well trained in communicative skills with regard to one's work and technology.

The committee has studied the intended learning outcomes and established that these are well defined. The intended learning outcomes clearly describe the competences students have to achieve in respect to knowledge, research, design and soft skills. The intended learning outcomes show the academic level required for Master's programmes as described in the Dublin descriptors and in the 3 TU Criteria for Academic Master's Programmes. The committee finds the learning outcomes clear and specific. They indicate in a transparent way the intended level and orientation of the programmes and the requirements the students have to meet for graduation.

Considerations

The committee concludes that the Master's programme Offshore & Dredging Engineering of the TU Delft is a unique programme, there are no comparable programmes offered in the Netherlands nor abroad. The profile of the programme is strongly related to the Delft engineering profiles and of academic level. The committee has verified and established that the profile and orientation are at an academic level.

The domain-specific framework of reference describes adequately what is expected of graduates. The international standards for the Master's level are reflected in the intended learning outcomes, both in general terms and for the domain Offshore and Dredging Engineering. The intended learning outcomes are transparent and specific and in line with the

ambitions of the programmes. The Master's programme, therefore, meets the criteria for standard 1 of the assessment framework.

Conclusion
Master's programme Offshore & Dredging Engineering: the committee assesses Standard 1 as **good.**

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:
The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

2. Findings

This section describes the following aspects: the structure of the curriculum (2.1), didactic principles (2.2), feasibility (2.3), staff (2.4), programme-specific facilities (2.5) and programme-specific quality assurance including the improvement measures that have been taken in response to the previous assessment (2.6).

2.1. Structure of the curriculum

During the review period the Master's programme was offered in three specialisations:

1. Bottom Founded Structures
2. Floating Structures
3. Dredging Engineering

Recently the number of specialisations was extended to four:

1. Bottom Founded Structures
2. Floating Structures
3. Ship & Offshore Structures
4. Dredging Engineering

The programme Offshore & Dredging Engineering consists of six parts:

1. The pre-master programme for Dutch HBO students (30 EC)
2. The core curriculum (27 EC)
3. Compulsory specialisation courses (15-17 EC)
4. Compulsory/elective project (8 EC)
5. Elective courses (8-10 EC)
6. Internship & MSc thesis (15 EC & 45 EC)

The first year of the master's programme consists of a core curriculum of about 27 EC. Students also have to carry out a project of 8 EC, either a field development project or an experimental exercise. The specialisations require compulsory courses of 15-17 EC. The 60 EC of the first year are completed with elective courses. The second year consists of an internship of 15 EC, which is compulsory for all the students with a university bachelor's degree, and the graduation project of 45 EC. The graduation project starts with a Problem

Analysis (15 EC), followed by the final thesis (30 EC), both about the same subject. Dutch students graduated from universities of applied sciences (HBO) have to choose 15 EC courses in order to improve their academic level. The first semester consists of 2 quarters which are filled with courses from the core curriculum. In the first semester there are some courses providing students with an overview of the whole field of Offshore & Dredging Engineering enabling the students to make the right choice.

Coherence of the programme is ensured by maintaining a core programme that is identical for all specialisations within the programme, extended with courses specific to each specialisation. The remaining credits are used for electives chosen in close conjunction with the graduation professor of the choice of the student. An overview of the programme is included in Appendix 4.

Recent developments from an industrial as well as from a scientific point of view are introduced in the courses and the examples provided. There is also a regular presentation of research results and new developments in the lecture courses. The master thesis project is frequently linked to a research project involving staff members and/or PhD students. The student is then supervised by the staff member involved and/or PhD student. In most cases, research projects are in co-operation with other partners: industry and research institutes. In other cases, the student assignments are linked to innovative projects of a research institute or an industrial partner. The (master thesis) projects always concern new developments, in the form of innovative designs (of systems, equipment or tools) or in the form of research, aiming to create new knowledge. In this way the master thesis project substantially contributes to the development of individual scientific skills (the project is almost always an individual assignment). It also contributes to a good understanding of the fundamental and domain-specific knowledge, the ability to apply it and the skills to set up and implement research. The main focus of the master is on (further) developing the academic skills and knowledge, such as analytical, modelling, literature research, complex problem solving. Good knowledge of the historical background of the route the industry and science have taken over the years will be helpful in achieving that goal. Although no explicit courses on the history of science for this section are given, individual courses pay attention to the gradual scientific progress and the changes of common practice over time.

The core curriculum is a combination of courses offered by the Faculty Civil Engineering and by the Faculty 3mE. The core curriculum in the first year is focussed on disciplinary knowledge and design. The assignments in the second year are much more focussed on scientific approach, conducting research and cooperating and communicating. Design and intellectual skills are exercised in the second year.

The committee studied the content of the courses in the core curriculum and concludes that they provide the knowledge and skills students with different backgrounds need to make a choice for a specialisation as well as to be able to do an internship and a research project in the second master year.

The committee noted that there is a tendency to develop specialisations within this Master's programme for every single full professor. The committee would not encourage that policy and recommends limiting the specialisations to the minimum required to cover the field. According to the committee too much dispersion will not necessarily lead to a common body of knowledge and acknowledged graduation profile of the ODE students.

2.2. Didactic principles

The teaching in the ODE programme is focused on the learning abilities of the students, which means that the teaching is meant to be student-centred. The overview of teaching forms used indicates that in the first year mainly lectures, tutorials and projects are used as teaching forms, while in the second year the main part of the programme is dedicated to the graduation project and the internship. The students report about a lot of small courses in the first semester of the Master's programme and a lot of exams. They have no problems with the teaching forms used. Most students seem to be practically oriented. They appreciate the project in the second semester of the first year and are looking forward to the internship and graduation project in the second year.

The committee concludes that the teaching forms used are appropriate. The alleged student-centeredness of the programme can mainly be recognized in the guidance and supervision of the internship and master's thesis in the second year.

2.3. Feasibility

Students with a BSc degree in Civil Engineering, Mechanical Engineering and Marine Technology can enrol directly into the programme. Students with a BSc degree in Aerospace Engineering or Technical Physics can also enrol. International students with these BSc degrees, a GPA of 75% and a sufficient TOEFL or IELTS test can also enrol. Students with a Dutch HBO degree in Mechanical Engineering, Civil Engineering or Marine Technology can enrol after completing a pre-masters course of about 30 EC. Students with a different background may apply and depending on their background there might be a dedicated solution, like following a pre-master's programme. The inflow of students has gradually increased from 15 in 2004 to 70 in 2011. The average duration of the study is estimated at 2.6 years. Study delay can often be traced to an extended internship, due to the company wishing to extend the internship period. The drop-out rate is probably low, although the programme could not give exact numbers.

As indicated, the students report a high study load in the first semester because of the number of courses offered. Other reasons for delay mentioned by the students are involvement in study associations, jobs, and a second internship, but in general the students found the programme feasible. Moreover, they told the committee that the teachers and programme management are willing to work on programme improvements to remove obstacles and avoid study delay. Students have no problem at all to find internships. They report that the business is booming and industry is very eager to attract students for internships, expecting and hoping to keep them after graduation.

The committee concludes that students can graduate within two years and that the study load of the courses is do-able. Improvements are possible but the committee understood that the programme management is restructuring the first semester by integrating the small courses into larger modules.

2.4. Staff

Teaching staff from different TUD faculties contribute to the ODE programme. Some lectures and projects are taught by external teachers. The total staff effort involved in teaching in the programme equals 5.9 fte with an average number of students registered of 180. This means that the teaching load is quite high (1: 30.5). There is a strong link between scientific research and education, due to the strong involvement of academic staff in both education and in research. Although appointment of scientific staff used to be based on scientific qualities and research achievements, during the last few years awareness has grown

that teaching qualities are equally important for personnel involved in the educational programmes. In the new method for job classification (UFO), teaching is an explicit part of the job description for academic staff. In the selection procedure of academic staff educational skills play an important role.

Teaching qualities are part of the employee assessment in the R&D staff cycle. The Basic Teaching Qualification programme (BTQ) has to be taken as a whole or as a set of tailor-made course by present teaching staff with no teaching experience. Lecturers who need to improve in certain areas, as a result of evaluations, or because of specific wishes or agreements with their manager, are given targeted training. Newly appointed lecturers must have obtained their BTQ within two years. Apart from the aforementioned BTQ, the level of proficiency in English of new staff is tested. Minimum standards do apply here as well and courses are offered to obtain and maintain this level of English. On top of these courses, staff has the opportunity to suggest courses to improve their teaching skills as well in their yearly job evaluation conversation.

Lecturers are either working in the industry or actively involved in the research. The attitude of the scientific staff that is involved in teaching is positive; they give education adequate priority. Involvement of teachers from both faculties as well as the input from external teachers working in industry is, according to the committee, a very good approach to ensure the necessary expertise from diverse disciplines.

Student evaluations show that the staff is seen as very approachable for the students and knowledgeable on their subjects. This evaluation was confirmed during the site visit by the students the committee has met. The students commend the staff for sharing their passion on their subjects. Students, however, consider the high work load of the staff as a limiting factor. When asked, one of the first improvements the students would like to implement is appointing more staff members. The committee has discussed the issue of understaffing with management and teachers and learned that solutions have been found in attracting teachers from other departments for thesis supervision. The committee appreciates this solution and established that quality and quantity of staff is adequate.

2.5. Programme specific facilities

The programme has a number of experimental facilities at its disposal, which it shares with the programme Marine Technology, such as model basins, workshops and a cavitation tunnel. Furthermore the section Dredging Engineering has a laboratory with a hydraulic pump system to carry out research into the hydraulic transport of high density solid / fluid mixtures. The committee made a tour to inspect some of the facilities and was impressed by the possibilities these have for education.

The committee concludes that the programme is very well equipped and appreciates that the excellent facilities are used for teaching. ODE students furthermore can make use of the study facilities in the Faculty 3mE. This faculty has to cope with a large inflow of students. The committee was impressed by the creativity of the management to find solutions for the large numbers of students it has to accommodate. All physical spaces are used in the most efficient way to create room for self study and projects.

2.6. Programme specific quality assurance

As part of the regular quality-assurance process, feedback from students, on both the programme and the individual courses, is obtained by means of on-line surveys and evaluation sessions. The committee met representatives of the Education Committee and

could establish that it is working adequately. The students reported to the committee that evaluation results are in fact discussed in the Evaluation Committee and that several of the reported issues resulted in changes and improvements in the programme. They also mentioned that many teachers have a personal response group and are continuously trying to improve themselves. Teachers can easily be approached by e-mail to make an appointment.

The programme management illustrated in its self evaluation report that it reacted positively to the recommendations by the previous assessment committee by, among others, introducing an introduction week in the curriculum and by building a more structured curriculum.

Considerations
The committee has investigated the different aspects of the teaching-learning environment to assess whether the intended learning objectives can be achieved. The meetings with students, staff and the Educational Committee gave clear information about the level and orientation of the programme.

The master's programme is well structured and contains all courses and trainings necessary to enable the students to achieve the intended learning outcomes. The programme enables the students to do an internship as well as a considerable research project. The described modes of instruction and teaching in the programmes are appropriate.

The committee appreciates the way solutions are sought for the understaffing of the programme due to the high increase of students. These solutions ensure that the academic staff involved in the programme is at an appropriate level, quantitatively and qualitatively.

The experimental facilities, like model basins and cavitation tunnels are excellent. The committee appreciates that these facilities are used in teaching and available for students. The facilities contribute to the quality of the ODE programme. The committee furthermore appreciates the creative way in which the Faculty management improves the study facilities with the limited means it has and the increasing student numbers.

Conclusion
Master's programme Offshore & Dredging Engineering: the committee assesses Standard 2 as **satisfactory.**

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:
The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

3. Findings

This section consists of two parts. First, it deals with the committee's findings with regard to the system of assessment (3.1). Secondly, it answers the question of whether students achieve the intended learning outcomes (3.2).

3.1. Assessment system

For each course in the curriculum the study results of the students are evaluated by one or more tests. All courses are tested by a written examination directly at the end of the teaching period. In case students fail a test, a resit is possible at the end of the next teaching period or in the August resit period. For each course two test possibilities are given per study year. In case a practical exercise is part of the course, the exercise will also be evaluated.

The Faculty 3mE has one Board of Examiners which is responsible for all degree programmes offered. It is responsible for the pass/fail rules, as well as the criteria for a degree with distinction (cum laude). The Board also sets the rules and guidelines for tests. The pass/fail rules for each type of courses/subjects of the different programmes are published in the study guide. The Board determines ten times per study year which students have passed and failed for the master's examinations. The pass/fail rules are then applied. In special cases the Board may deviate from these rules but always in favour of the student. For each course the testing method is determined by the responsible teacher of that course in consultation with the Director of Education and/or the Education Advisor.

The committee had a meeting with the Board of Examiners and established that the Board is in control of the rules and the procedures for exams. The committee has noted that the board is aware of the recent extension of its responsibilities and that it is in the process of developing and implementing policies and plans in regard to testing and exams 'the New Delft Test Methodology'. The committee noticed that a variety of forms were still used for the assessment of Master's graduation projects. The board of Examiners assured the committee that it has taken action to achieve uniformity of the forms and the way the forms are used.

3.2. Achievement of intended learning outcomes

During the site visit examinations including the students' answers were available for inspection by the committee. They were found to be at an adequate level and well-marked.

The committee has studied a selection of five Master's theses to assess whether the intended learning outcomes are achieved. The Master's theses the committee has studied were also adequately assessed. The Master's theses indicate that the graduates have achieved the level that can be expected in a Master's degree programme. Graduates of the ODE programme of the TU Delft easily find employment at an academic level and are satisfied with their education. Graduates of the programme also easily obtain a PhD position. Outcomes of a recently conducted employer survey, which were available for the committee, indicate that the graduates demonstrate above-average compliance with the final qualifications. On basis of these indications the committee concludes that ODE Master's students achieve the intended learning outcomes.

Considerations

The committee has looked into the assessment system and the theses in order to answer the question if the intended learning outcomes are achieved. The committee is convinced that the assessment system is sufficiently valid and reliable. The committee has seen that the Board of Examiners is in control and has made a start with the implementation of an updated, adapted to renewed legislation, test policy and with achieving uniformity of the Master's theses assessment forms.

The theses are at the required level of an academic Master's programme; graduates have an excellent foundation for a career in industry as well as in research

Conclusion
Master's programme Offshore & Dredging Engineering: the committee assesses Standard 3 as **good.**

General conclusion

The committee concludes that Master's programme Offshore & Dredging Engineering meets the requirements for accreditation. The intended learning outcomes are formulated in line with the Domain-specific framework and the requirements for an academic Master's programme. The curricula enable the students to achieve the intended learning outcomes. The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved. The assessment system is sufficiently valid and reliable. Graduates have an excellent foundation for a career in industry and research.

Conclusion
The committee assesses the *master's programme Offshore & Dredging Engineering* as **good.**

Appendices

Appendix 1: Curricula Vitae of the members of the assessment committee

Joris De Schutter (chair) received the M.Sc. degree in mechanical engineering from the Katholieke Universiteit Leuven, Belgium, in 1980, the M.Sc. degree from the Massachusetts Institute of Technology, in 1981, and the Ph.D. degree in mechanical engineering, also from KU Leuven, in 1986. Following work as a control systems engineer in industry, in 1986, he became a lecturer in the Department of Mechanical Engineering, KU Leuven, where he has been a full professor since 1995. He teaches courses in kinematics and dynamics of machinery, control, robotics and optimization. His research interests include sensor-based robot control and programming, optimal motion control of mechatronic systems, and modeling and simulation of human motion. In 2000-2001 he spent a sabbatical year in industry (environmental technology). From 2001 to 2003 he was president of K VIV, the Flemish association of university-graduated engineers.

Gijs Calis received his master's degree in Mechanical Engineering (Production Automation) from Eindhoven University of Technology in 1974. He held various management positions within the Stork group of companies as of 1974. His latest position was Corporate Director Risk Management, Stork B.V.; Corporate Head Office (2002 – 2010).
He retired in April 2010. His current other positions include being the chairman of the Division of Mechanical Engineers of the Royal Institute of Engineers in The Netherlands; vice-chairman and arbitrator of the Council of Arbitration for the Metal Trade and Industry; and chairman of the Policy Committee 'Machinebouw' of NEN, the standardisation institute of the Netherlands. Formerly he was a member of the Advisory Board of the Graduate School of Engineering Mechanics in the Netherlands (1996 -2011) and a member of the Advisory Committee to the Faculty of Mechanical Engineering of Delft University of Technology (1996 - 2000) and the UHD committee of this Faculty (2000 – 2005).

Hetty Grunefeld has a master's degree in Computer Science from the University of Twente (1988). Since then she worked as a teacher and as educational consultant within the Faculty of Computer Science on several curriculum development and quality enhancement projects. In 1995 she started working within the Educational Centre on similar projects in e.g. Mechanical Engineering. Since 2001 she has been working as an educational development consultant at Utrecht University. She is involved in curriculum development projects and quality enhancement. She is programme leader of the prestigious course Educational Leadership that was developed by Utrecht University. She was a member of the assessment committee that evaluated the quality of the Electrical Engineering programmes (HBO, 1995) and of the committee for Economics (WO, 2009).

Elze Porte is master student Mechanical Engineering uit the University Twente. She did her bachelor programme Mechanical Engineering in Twente and a minor at the Technical University in Vienna. She has been a member of the educational committee since 2010 and a member of the committee for the restructuring of the mechanical engineering programmes since 2011. In 2011 and 2012 she has been a student assistant for the Calculus 3 course.

Paul van Houtte is professor at the Department of Metallurgy and Materials Engineering of the Katholieke Universiteit Leuven, Belgium. He did his Master of Science in Mechanical Engineering in 1970 at the Faculty of Engineering of the "Katholieke Universiteit Leuven", Belgium and his Ph. D in 1975, directed by Prof. Etienne Aernoudt, of the Department of Metallurgy of the Katholieke Universiteit Leuven were Van Houtte remained during his career. From 1975 -1977: research associate (temporary position), 1977-1988: permanent position as assistant (several ranks), 1988-present: permanent position as professor (several

ranks); from 1995: Full Professor. He has been member and chair of several committees among which member of the evaluation commission of the Faculty of Engineering.

Marc Vantorre obtained his degree of naval architect (MSc) in 1981 and PhD titles in 1986 and 1990, all at Ghent University. Presently he holds the position of senior full professor at Ghent University (Faculty of Engineering and Architecture), where he is head of the Maritime Technology Division. He is responsible for the courses in maritime hydrostatics and hydrodynamics for students Master of Electromechanical Engineering (main subject Maritime Engineering). He also teaches courses Ship Technology and Water & Shipping on behalf of the interuniversity (UGent - UA) programmes Master of Maritime Science and Advanced Master Technology for Integrated Water Management, respectively. He is member of the Programme Committees of the mentioned master programmes. His research activities concern ship behaviour in shallow and restricted waters, including maneuvering and vertical motions induced by waves and squat, as well as wave energy conversion. The research on the first topic is mainly performed in close co-operation with Flanders Hydraulics Research (Antwerp, Flemish Government). He is and has been member of several international working groups (PIANC, ITTC).

Appendix 2: Domain-specific framework of reference

On a global scale, to ease the scarcity of land, hydrocarbons, minerals and rare metals and to reduce the impact on the environment and on society, the reclamation of land for industrial purposes and the exploration of hydrocarbons and minerals is moving more and more offshore into deeper waters. To open new horizons and to meet the challenges of the near future requires the development of new, innovative, inter-disciplinary technologies and methodologies. The exploration of hydrocarbons at 3000 m water depth, floating airports, trailing suction hopper dredges of 50.000 m3, diamond mining at the sea and ocean floor with remote/autonomous operated vehicles, pipe-laying in deep water, arctic engineering and deep sea mining will all be possible in the near future, but require a lot of fundamental research.

Offshore and Dredging Engineering comprises the design and operation of semi-stationary floating systems in a marine environment, with the purpose of exploring, exploiting, storing and transporting/lifting (valuable) materials, like hydrocarbons, minerals and rare metals.

ODE also deals with auxiliary systems and equipment for the construction and placement of these systems, for decommissioning, including autonomous and remotely operated vehicles.
Offshore and Dredging Engineering has a strong inter-disciplinary character based on marine, mechanical and civil engineering, with extended use of control engineering, electronics, telematics and informatics.

Offshore and Dredging Engineering systems are characterized by large scale, capital intensive, unique systems, with some connection to the sea-floor, subjected to an aggressive environment with wind, wave and current induced high static and dynamic forces, that influence the behaviour and operations.
During the last decennia the scale of Offshore and Dredging Engineering systems has increased (due to societal and economic demands) and is expected to further increase, with respect to dimensions, operating water depth, transport distance, production and thus investment. At the same time, the demand for higher quality, accuracy, safety, reliability and sustainability is also increasing, requiring a high level of process knowledge and control. The integrated use of modern technologies with respect to the design and operations stages such as solid modeling, FEM, DEM, multi-body, hydrodynamics, CFD and control engineering (simulation) software for the design stage and dynamic positioning, tracking and monitoring systems for the operations stage, requires an inter-disciplinary approach, similar to Mechatronics, but on a large scale: Megatronics.

Offshore and Dredging Engineering can be subdivided into the following phases:

- Exploration, investigation
- Installation, mobilisation
- Exploitation, excavation, mining
- Monitoring, survey
- Decommissioning

The processes involved can be subdivided into to following categories:

- Drilling, mining and cutting processes
- Reaction forces counteracting the drilling, mining and cutting forces (Mooring systems)

- Vertical transport
- Pre-processing and buffering
- Horizontal (hydraulic) transport, discharge and sedimentation
- Dispersed multi-phase flows
- The response of Offshore and Dredging systems to the aggressive offshore environment

A thorough knowledge of the physical processes; solid mechanics, fluid mechanics (multi-phase flow), hydromechanics, soil mechanics, drilling and cutting mechanics is indispensable to be able to understand and control the processes involved and to ensure the quality, safety and reliability of Offshore and Dredging engineering systems.

Appendix 3: Intended learning outcomes

The final qualifications show the competences of the graduated Master of Science in Offshore & Dredging Engineering. The elaborated final qualifications are the basis for the compulsory courses and the learning goals of each course.

1. Competence in one or more scientific disciplines

a. Most of the required knowledge has been obtained in the BSc or pre-master programme.

b. General Offshore & Dredging Engineering knowledge is obtained in the core curriculum, such as Hydromechanics, Ocean Waves, Oceanography, Soil Mechanics, Control Engineering.

c. More specific knowledge is obtained in the compulsory specialisation courses, such as Dynamics of Structures, Bottom Founded Structures, Dredging Processes, Hydraulic Transport.

2. Competence in conducting research

a. The research is focused on the understanding of the physics involved in Offshore & Dredging Engineering, this is covered in a number of courses, but more specifically in The Experimental Exercise and in the MSc thesis.

3. Competence in designing

a. Offshore & Dredging systems are very complex systems, which operate at the boundaries of what is physical possible. The design is based on the physical processes involved.

b. Offshore & Dredging Engineering is a global business, which means that most systems will operate in another part of the world.

c. The design on one hand requires a proper understanding of the physics and the available tools, on the other hand a proper understanding of the complexity of the systems.

d. The temporal and social context is very important in the design and are integrated in the design methodologies. Health, safety & environment are always an issue, but also the political situation and the way a country is organized (think of unions).

e. These aspects are taken into account mostly in the projects in the curriculum, like the Survey of Offshore project where the students have to make a design for oil or gas field development, but also in the Drive Systems Design project, the Offshore Moorings project and the Dredging Design project.

f. The MSc thesis in general also contains a large design component, although this depends on the subject.

4. Scientific approach

a. The ability to apply methods, tools and techniques based on the existing knowledge and skills in an advanced and more profound way to obtain optimum designs, efficient production processes, economic operations or in research.

b. Capability to independently formulate and execute a research or design plan, and to steer adaptations if required by technological developments within the discipline or by changing external circumstances.

c. This is developed and tested operationally mainly in the Problem Analysis Thesis and the MSc thesis, although some students already exercised this during the Experimental Exercise and in other projects.

5. Basic intellectual skills

a. Capability to decompose complex problems into subproblems, to analyse these subproblems and formulate innovative solutions, and to interpret the results in terms of the overall problem formulation. This includes the ability to detect and reformulate ill-posed research and design problems and to suggest remedies.

b. Capability to conceive knowledge gaps and to independently acquire expertise through studying the scientific literature on the discipline and/or to acquire this knowledge through other experts. Skill to contribute to the development of scientific knowledge or to design techniques in the area of specialisation.

c. Capability to conceive alternative and innovative solutions to discipline-related problems, including the ability to work out the chosen solution up to the level of real life implementation.

d. Awareness of the (historic) development of the discipline, of its technological and scientific boundaries, and consequently of the necessity of life-long learning to maintain the desired level.

e. This is developed and tested operationally mainly in the Problem Analysis Thesis and the MSc thesis, although some students already exercised this during the Survey Project, the Experimental Exercise and in other projects.

6. Competence in cooperating and communicating

a. Capability to work independently and in teams on problems of high technological and/ or scientific complexity.

b. Capability to set up and maintain a plan, to delegate and to coordinate tasks, to negotiate and handle conflicts, to recognise strong and weak points of themselves and of others.

c. Capability to handle tasks which initially seem straightforward, but at a later stage require additional knowledge.

d. Give well-structured presentations for different audiences using state-of-the-art presentation techniques.

e. Write well-structured and clear reports and contributions to scientific papers.

f. Convey acquired knowledge and results to others in a clear and convincing way.

g. Read, interpret and summarise literature; idem for verbal communication.

h. In the first week of the programme the students already work in teams and have to give presentations, in the Survey project, the Drive Systems project, the Offshore Moorings project, the Dredging Design project and the MSc thesis these skills have to be used, either as a team or individually.

7. Consideration of the temporal and social context

a. Describe and implement sustainable development.

b. Recognise moral issues, argue who play a role in these and be aware of his / her own position.

c. Assess safety risks both qualitatively and quantitatively; methods for reducing safety risks.

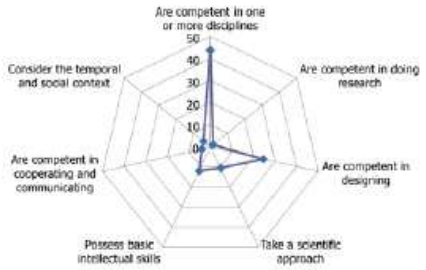
d. Analyse and assess the technical, economic and social feasibility of engineering solutions.

e. The Survey of Offshore project specifically.

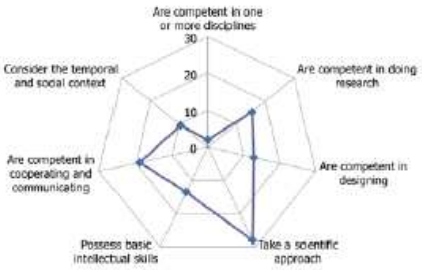
Appendix 4: Overview of the curriculum

The relationship between the final seven 3TU qualifications and the ODE programme contents has been investigated for each item of the programme. Each of the teachers has been asked to divide 100% over the seven qualifications for their courses and or projects. This has resulted in a detailed overview of the MSc programme Offshore & Dredging Engineering. The results of this investigation are shown in Figure 3, Figure 4, Figure 5, Figure 6 and Figure 7. It can be seen that the core curriculum in the 1st year is focussed on disciplinary knowledge and design, while the assignments in the 2nd year are much more focussed on scientific approach, conducting research and cooperating and communicating. Design and intellectual skills are exercised in the 2nd year. The total core curriculum (1st + 2nd year) gives a more balanced view. The spider graphs of the 4 specialisations (Figure 7) also include the specialisation courses and some elective courses. Because of adding more courses with disciplinary knowledge the graphs may shift a bit to this qualification, but overall the graphs look balanced. The small differences between the 4 specialisations are caused by the different focus of each specialisation, but also because of the inherent variance of the investigation.

Core Curriculum 1st Year

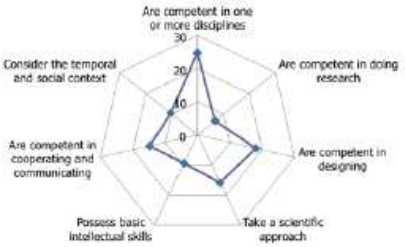


Core Curriculum 2nd Year

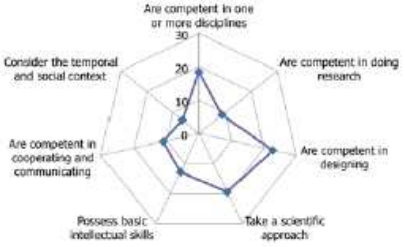


Core Curriculum Total

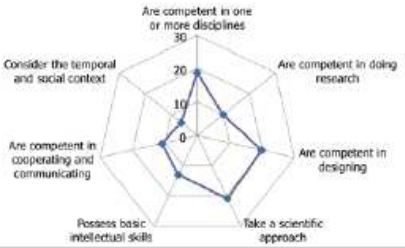
Bottom Founded Structures



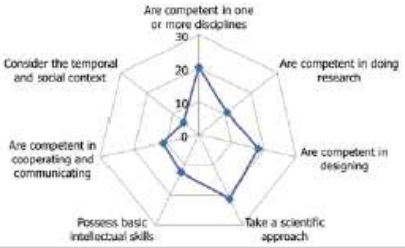
Floating Structures



Ship & Offshore Structures



Dredging Engineering



Program overview

28-Nov-2012 15:41

Year	**2012/2013**
Organization	**Werktuigbouwkunde, Maritieme Techniek & Technische Materiaalwetenschappen**
Education	**Master Offshore and Dredging Engineering**

Code	Omschrijving	ECTS	p1 | p2 | p3 | p4 | p5
Master ODE 2012	**Master Offshore & Dredging Engineering 2012**		
MSc ODE 1st year	**MSc Offshore & Dredging Engineering 1st year**		
AES1730	Soil Mechanics Applications	3	
CIE4130	Probabilistic Design	4	
CIE4325OE	Ocean Waves for Offshore	3	
CIE5317	Physical Oceanography	3	
OE4605	Introduction ODE	0	
OE4606	Introduction to Offshore Engineering	3	
OE4607	Introduction to Dredging Engineering	3	
OE4610	Survey of Offshore Engineering Projects	8	
OE4611	Experimental Engineering Exercise	8	
OE4630	Offshore Hydromechanics	8	
OE4630 D1	*Offshore Hydromechanics, Part 1*	*1,5*	
OE4630 D2	*Offshore Hydromechanics, Part 2*	*2*	
OE4630 D3	*Offshore Hydromechanics, Part 3*	*3*	
OE4630 D4	*Offshore Hydromechanics, Part 4*	*1,5*	
SC4026	Control System Design	3	
MSc ODE Bottom Founded Structures			
CIE4140	Structural Dynamics	4	
OE4624	Offshore Soil Mechanics	3	
OE4651-12	Bottom Founded Structures	5	
MSc ODE Dredging Engineering			
OE4623	Drive System Design Principles	3	
OE4625	Dredge Pumps and Slurry Transport	4	
OE4626	Dredging Processes	4	
OE5671	Dredging Equipment Design	4	
MSc ODE Floating Offshore Structures			
CIE4140	Structural Dynamics	4	
OE4623	Drive System Design Principles	3	
OE4652	Floating Structures	4	
OE5663	Dynamic Positioning	3	
OE5664	Offshore Moorings	3	
MSc ODE Ship & Offshore Structures			
CIE4140	Structural Dynamics	4	
MT523-S	Numerical Methods - Structural	2,5	
MT830	Applications of the Finite Element Method	3	
OE4652	Floating Structures	4	
OE5664	Offshore Moorings	3	
MSc ODE Elective Courses			
AE3W02TU	Introduction to Wind Energy	4	
AT327-12	Arctic Offshore Engineering (Spitsbergen)	6	
OE4640	Safety in Offshore Engineering	2	
OE4653	Marine Pipelines	4	
OE4654	Sub Sea Engineering	4	
OE4680-12	Arctic Engineering	4	
OE5662	Offshore Wind Farm Design	4	
OE5665-12	Offshore Wind Support Structures	4	
MSc ODE 2nd year	**MSc Offshore & Dredging Engineering 2nd year**		
OE5680-15	Industrial Practice	15	
OE5685-15	Problem Analysis Thesis	15	
OE5690-30	Thesis	30	

Appendix 5: Quantitative data regarding the programme

Data on intake, transfers and graduates

Dutch Technical Universities/Intake
Students with a BSc in Civil Engineering, Mechanical Engineering and Marine Technology from Dutch universities can enrol directly into the programme as well as students with a BSc in Aerospace Engineering or Technical Physics.
Students with other BSc degrees are required to follow repair courses on top of the 120 EC for the MSc programme before starting the actual programme. The number of EC of the repair courses depends on the individual situation. A proposal has to be submitted and be approved by the exam committee of 3mE.
Since regular students come from different backgrounds the curriculum contains two repair courses. Students with a Civil Engineering BSc have to follow a Control Engineering course, all other students a Soil Mechanics course. Both are part of the regular programme.

International Students/Intake
International students with the BSc degrees in Civil Engineering, Mechanical Engineering and Marine Technology, a GPA of 75% and a sufficient TOEFL or IELTS test can also enrol. Often the name of the BSc programme in other countries is different e.g. Ocean Engineering or Naval Architecture. If these programmes are sufficiently similar to the above BSc degrees, students with such a degree can also enrol.
It is difficult to make exceptions for alternative BSc degrees, since most repair courses will be in Dutch and most international students do not master the Dutch language.

Dutch HBO students/Intake
A special group is the Dutch HBO students. If they have a diploma in the above fields, they can enrol, but first they have to finish a pre-master programme of about 30 ECTS. The pre-master programme for HBO students with Civil Engineering is differs slightly from the programme for students with another diploma. International students cannot do this pre-master programme, since it is given in the Dutch language.

Intake numbers/Intake
The MSc programme Offshore & Dredging Engineering started in September 2004 with about 15 new students. At that moment there were still about 20 students following the old specialisations at Civil Engineering and Mechanical Engineering & Marine Technology leading to the respective diplomas. The inflow of students in the ODE programme has gradually increased from the 15 in 2004 up to about 70 in September 2011. However it is difficult to give exact numbers, since it is not always clear when a student finished the BSc and started the MSc. Since the Delft University introduced the "harde knip", meaning that a student can only register for the MSc programme after completing the BSc, the start date will be clear.
This system is implemented and starts to function in 2011/2012. The student population of ODE consists of about 10 international students, about 10 Dutch HBO students and about 50 university BSc degree students.
When the programme started in 2004 about 60%-70% of the students had a Civil Engineering background, but this has changed with the increased inflow. Now 60%-70% has a Mechanical Engineering or Marine Technology background, a single student an Aerospace Engineering or Physics background and the rest a Civil Engineering background.

Dropout rate
The dropout rate is low, although no exact numbers exist. An estimate would be between 0% and 5%.

Number of Diplomas
Since it is very difficult to quantify the intake, the number of diplomas is given in Table 2. Since we have the "harde knip", the intake is easier to determine. From September 1st 2011 about 70 students have enrolled and the number of diplomas in 2012 is expected to be approximately 60.

Table 2 *Number of Diplomas.*

Year	Number of Diplomas
2006	12
2007	26
2008	24
2009	31
2010	44
2011	53

Teacher-student ratio achieved

Table 4 *Student staff ratio at 3mE.*

year	number of students 3mE as per December 1st	total staff 3mE [FTE]	students/staff
2005	1.803	113,2	15,9
2006	1.914	126,2	15,2
2007	2.090	133,7	15,6
2008	2.308	133,3	17,3
2009	2.525	136,3	18,5
2010	2.633	137,8	19,1
2011	2.809	135,9	20,7

Average amount of face-to-face instruction per stage of the study programme

Estimated time that students spend in various forms of contact hours and self-study as a percentage of total study load (2011-2012)

	Contact hours				Self-study and group work				
				Total				Total	Total
	Lectures tutorials	Practical training, projects	Grad. project		Indiv. study	projects	Grad. project		
Year 1	21% 352 hr	5% 90 hr	0% 0 hr	26% 442 hr	44% 734 hr	30% 504 hr	0% 0 hr	74% 1238 hr	1680 hr
Year 2	0% 0 hr	2% 35 hr	6% 100 hr	8% 135 hr	0 % 0hr	30% 505 hr	62% 1040 hr	95% 1545 hr	1680 hr
Overall	10,5% 352 hr	3,5% 125 hr	3% 100 hr	17% 577 hr	22% 734 hr	30% 1009 hr	31% 1040 hr	83% 2783 hr	3360 hr

Appendix 6: Programme of the site visit

Sept 20th, 2012 (1st day)

time	Subject	invited persons	additional info
08.45-09.00	reception of the committee	Prof. dr. TS (Theun) Baller Prof. dr. ir.J (Hans) Hellendoorn Dr. ir. D (Dick) Nijveldt	Dean Director of Education QA/QC staff member
9.00-10.00	management 3mE	*Prof. dr. ir. J (Hans) Hellendoorn* Dr. ir. SA (Sape) Miedema F.P.M. (Frans) van der Meijden L.J.H. (Leonie) van den Boom Dr. ir. D (Dick) Nijveldt	Director of Education Programme Director ODE Head ESAD Head M&C QA/QC staff member
10.00-11.00	students BSc and MSc ME	*B.M. (Bart-Jan) van Roekel* J.C.R. (Joris) Molenaar N.J. (Nils) Velders R.M.M. (Romy) Welschen *S (Sander) van Weperen* S.F. (Sander) van den Broek V (Vincent) Oldenbroek J(Johann) Dugge	*BSc 4th year* BSc 3rd year BSc 3rd year BSc 2nd year MSc-BMD MSc-PME MSc-SPET MSc-SFM
11.00-11.45	lecturers BSc and MSc ME	Prof. dr. ir. J (Jerry) Westerweel *Prof. dr. R (Robert) Babuska* Dr. ir. SE (Erik) Offerman Dr. R (Roelof) Koekoek Dr. ir.GJM (Gabrielle) Tuijthof Dr. ir. A (Anton) van Beek Prof. dr. ir. AI (Andrzej) Stankiewicz Ir. E.J.H. (Edwin) de Vries	BSc/MSc BSc/MSc BSc/MSc BSc BSc/MSc BSc/MSc BSc/MSc BSc/MSc
11.45-12.15	Education Committee (ME)	*Prof. dr. R. (Robert) Babuska* Dr. ir. W (Wiebren) de Jong Ir. J.J.L. (Jan) Neve Dr. ir. D..L. (Dingena) Schott Dhr. P.G.J. (Pieter) Smorenberg Mw. C (Carmen) Molhoek H.C. (Dick) Kramers	Chairman Lecturer Lecturer Lecturer Student Student Student
12.15-13.00	committee lunch (private)	-	
13.00-13.45	tour of the facilities (ME and MSE)	Prof. dr. ir. J (Hans) Hellendoorn F.P.M. (Frans) van der Meijden Dr. ir. D (Dick) Nijveldt	Director of Education Head ESAD QA/QC staff member
13.45-14.00	Break	-	
14.00-14.30	students MSc ODE	*V.H.R.I. (Vincent) Doedee* R.A. (Robert) Weegenaar J.A. (Juri) Vogel M.W. (Marnix) Broer G.P.A. (Gerben) Smit	Student Student Student Student Student
14.30-15.00	lecturers MSc ODE	*Dr. ir. S.A. (Sape) Miedema*	Lecturer

		Prof. dr. ir. M.L. (Mirek) Kaminski	Lecturer
		Prof. dr. ir. C (Cees) van Rhee	Lecturer
		Prof. dr. ir. R.H.M .(René) Huijsmans	Lecturer
		A.B. (Gus) Cammaert	Lecturer
		Ir. J.S. (Jeroen) Hoving	Lecturer
		Ir. N.F.B. (Niels) Diepeveen	Lecturer
15.00-15.30	students MSc MSE	S.T. (Shoshan) Abrahami	Int. student
		W.S. (Wouter) Geertsma	Student
		W (William) Mao	Int. student
		D (Dany) Enciso	Int. student
		X (Ashley) Zhang	Int. student
		A.J. (Arnold) Kolk	HBO student
		M.C.J. (Maarten) van Ramshorst	Student
15.30-16.00	lecturers MSc MSE	Prof. dr. B.J.(Barend) Thijsse	Lecturer
		Dr. M.H.F. (Marcel) Sluiter	Lecturer
		Prof. dr. .IM. (Ian) Richardson	Lecturer
		Prof. dr. ir. J (Jilt) Sietsma	Lecturer
		Dr. A.J. (Amarante) Böttger	Lecturer
		Dr. ir. L (Lucia) Nicola	Lecturer
		Dr. ir. J.M.C. (Arjan) Mol	Lecturer
		Dr. ir. M (Michael) Janssen	Lecturer
16.00-16.30	Education Committee (ODE)	*Prof. dr. ir. C (Cees) van Rhee*	Chairman
		Prof. dr. A (Andrei) Metrikine	Lecturer
		V.H.R.I. (Vincent) Doedee	Student
		R.A. (Robert) Weegenaar	Student
	Education Committee (MSE)	*Prof. dr. J (Joris) Dik*	Chairman
		Dr. E (Eduardo) Mendes	Lecturer
		T.W. (Tomas) Verhallen	Student
		H (Harini) Pattabhiraman	Int. student
16.30-17.15	Board of Examiners 3mE	*Dr. ir. C.A. (Carlos) Infante Ferreira*	Chairman
		Dr. ir. S.A. (Sape) Miedema	Lecturer
		Dr. ir. R.A.J. (Ron) van Ostayen	Lecturer
		Dr. ir. A.J. (Arjan) den Dekker	Lecturer
		Prof. dr. I.M. (Ian) Richardson	Lecturer
		Dhr. E.P. (Ewoud) van Luik	Secretary
17.15-18.00	alumni 3mE	Michel Corbeau	Professional field ME
		Clemens van der Nat	Professional field MT-ODE
		Florian Wasser	Alumnus ODE
		Sjoed Hesjdahl	Alumnus ME-PME
		Tjark van Staveren	Alumnus MSE
		Frans Kortekaas	Alumnus ME-TE
		René Hiemstra	Alumnus MT-SC

Sept 21st, 2012 (2nd day)

time	Subject	invited persons	additional info

09.00-10.00	students BSc and MSc MT	H.W. (Hedde) van der Weg M (Menno) Sonnema *A.F. (Floor) Spaargaren* D.P.(Daniel) Langereis R (Roel) Karstens A (Arno) Dubois M.J. (Myriam) Koopmans	BSc 2nd year BSc 3rd year BSc 4th year BSc 3rd year MSc-DPO MSc-SC MSc-SC
10.00-10.45	lecturers BSc and MSc MT	Ir. P (Pepijn) de Jong *Prof. ir. J.J. (Hans) Hopman* Prof. dr. ir. R.H.M. (René) Huijsmans Prof. dr. ir. .M.L. (Mirek) Kaminski Ir. R.G. (Robert) Hekkenberg Ir. J.F.J. (Jeroen) Pruyn	BSc/MSc BSc/MSc MSc BSc/MSc BSc/MSc BSc/MSc
10.45-11.00	Break	-	
11.00-11.30	Education Committee (MT)	*Prof. ir. J.J. (Hans) Hopman* Prof. dr. ir. R.H.M. (René) Huijsmans Ir. R.G. (Robert) Hekkenberg J.M. (Jurrit) Bergsma C.W. (Coen) Bouhuijs S.E.M. (Salomon) Brummel A.F. (Floor) Spaargaren	Chairman Lecturer Lecturer Student Student Student Student
11.30-12.15	tour of the facilities (MT & ODE) / individual consultations as requested in parallel	Prof. dr. ir. J (Hans) Hellendoorn F.P.M. (Frans) van der Meijden Dr. ir. D (Dick) Nijveldt	Director of Education Head ESAD QA/QC staff member
12.15-13.00	committee lunch (private)	-	
13.00-13.30	preperation for the 2nd meeting with the management	-	
13.30-14.30	2nd meeting with the management 3mE	*Prof. dr. ir. J (Hans) Hellendoorn* Dr. ir. S.A. (Sape) Miedema F.P.M. (Frans) van der Meijden L.J.H. (Leonie) van den Boom Dr. ir. D (Dick) Nijveldt	Director of Education Programme Director ODE Head ESAD Head M&C QA/QC staff member
14.30-16.30	internal discussion session of the committee, assessment and preperation breefing session	-	
16.30-17.00	breefing session	public session	
17.00-18.00	get-together' with drinks	public session	

Appendix 7: Theses and documents studied by the committee

Prior to the site visit, the committee studied the theses of the students with the following student numbers:

Master:

1108743	1383450
1203940	1218395
1180576	1180592
1091468	1187449
1262173	1148028
1173766	1013017
1173626	1098438
9701306	1108271
1532189	1291874
1394169	1143484
1532065	1011138

During the site visit, the committee studied, among other things, the following documents (partly as hard copies and electronically distributed documents, partly via the institute's electronic learning environment):

Course materials for courses and projects:

- Course outlines
- Assignments
- Answers and assignment papers by students
- Evaluation forms

Educational committee:

- Annual educational reports
- Course evaluations

Board of Examiners;

- Annual reports
- Letters and communications to staff

Professional Field Advisory Board;

- Minutes

Appendix 8: Declarations of independence

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: BARBARA VAN BAIEN

PRIVÉ ADRES:

KLEINE HOUTWEG 8
2012 CH HAARLEM

IS ALS ~~DESKUNDIGE~~ / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Mechanical Engineering, Materials Science and Engineering, Marine Technology, Offshore and Dredging Engineering

AANGEVRAAGD DOOR DE INSTELLING:

TECHNISCHE Universiteit Delft.

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

1

nvao
nederlands - vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Utrecht DATUM: 28-8-2012

HANDTEKENING:

2

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Paul VAN HOUTTE

PRIVÉ ADRES: WIJNGAARD 23
BE - 3110 ROTSELAAR
BELGIË

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Werktuigbouwkunde 3TU OW 2012

AANGEVRAAGD DOOR DE INSTELLING:

T.U. DELFT

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

1

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

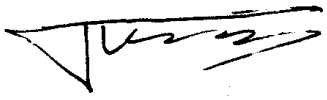
VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Rotterdam

DATUM: 4 / 9 / 2012

HANDTEKENING:



nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: JORIS DE SCHUTTER

PRIVÉ ADRES: TH. VAN RYSWYCKLAAN 1
B-2850 BOOM
BELGIE

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

WERKTUIGBOUWKUNDE

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft, TU Eindhoven
Universiteit Twente

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

1

nvao
nederlands - vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Boom DATUM: 2 september 2012

HANDTEKENING:

2

nvao
nederlands-vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Elze Porte

PRIVÉ ADRES:

Toekomststraat 6u

7521 CT Enschede

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Werktuigbouwkunde

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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nvao
nederlands-vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Rotterdam DATUM: 04-09-2012

HANDTEKENING:

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: G. Calis

PRIVÉ ADRES: Plasweg 50
3768 AM Soest

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Werktuigbouwkunde (en Maritieme Techniek)
aan TUD, TUE en UT

AANGEVRAAGD DOOR DE INSTELLING:

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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nvao
nederlands - vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/HAAR BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Rotterdam DATUM: 4 sept. 2012

HANDTEKENING:

nvao
nederlands-vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: ir H. Grunefeld

PRIVÉ ADRES:

Wevelaan 55
3571 XS Utrecht

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

werktuigbouwkunde, maritieme techn. TUD
werktuigbouwkunde TUE

AANGEVRAAGD DOOR DE INSTELLING:

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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nvao
nederlands-vlaamse accreditatieorganisatie

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VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS:
Rotterdam

DATUM:
4 september 2012

HANDTEKENING:
H Gruefeld

nvao
nederlands - vlaamse accreditatieorganisatie

ONAFHANKELIJKHEIDS- EN GEHEIMHOUDINGSVERKLARING

INDIENEN VOORAFGAAND AAN DE OPLEIDINGSBEOORDELING

ONDERGETEKENDE

NAAM: Marc VANTORRE

PRIVÉ ADRES:

Drakenhoflaan 61
B 2100 Antwerpen

IS ALS DESKUNDIGE / SECRETARIS GEVRAAGD VOOR HET BEOORDELEN VAN DE OPLEIDING:

Werktuigbouwkunde

AANGEVRAAGD DOOR DE INSTELLING:

TU Delft
Univ. Twente

VERKLAART HIERBIJ GEEN (FAMILIE)RELATIES OF BANDEN MET BOVENGENOEMDE INSTELLING TE ONDERHOUDEN, ALS PRIVÉPERSOON, ONDERZOEKER / DOCENT, BEROEPSBEOEFENAAR OF ALS ADVISEUR, DIE EEN VOLSTREKT ONAFHANKELIJKE OORDEELSVORMING OVER DE KWALITEIT VAN DE OPLEIDING TEN POSITIEVE OF TEN NEGATIEVE ZOUDEN KUNNEN BEÏNVLOEDEN;

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nvao
nederlands - vlaamse accreditatieorganisatie

VERKLAART HIERBIJ ZODANIGE RELATIES OF BANDEN MET DE INSTELLING DE AFGELOPEN VIJF JAAR NIET GEHAD TE HEBBEN;

VERKLAART STRIKTE GEHEIMHOUDING TE BETRACHTEN VAN AL HETGEEN IN VERBAND MET DE BEOORDELING AAN HEM/~~HAAR~~ BEKEND IS GEWORDEN EN WORDT, VOOR ZOVER DE OPLEIDING, DE INSTELLING OF DE NVAO HIER REDELIJKERWIJS AANSPRAAK OP KUNNEN MAKEN.

VERKLAART HIERBIJ OP DE HOOGTE TE ZIJN VAN DE NVAO GEDRAGSCODE.

PLAATS: Rotterdam

DATUM: 4/8/2012

HANDTEKENING:

Addendum

The following tables should be added to Assessment Report of the Offshore and Dredging Engineering, Master's Programme Delft University of Technology 30 November 2012 Appendix 5 page 33.

cohort	cohort size	relative cumulative MSc yield: relative to n years of study		average study duration	% with distinction	still enrolled	drop-out cumulative	maximu yield
		<= 2	<= 3					
2005	1	100 %		1.9			0 %	100 %
2006	1		100 %	2.1			0 %	100 %
2007	8	38 %	75 %	2.2	17 %		25 %	75 %
2008	11	27 %	73 %	2.2		27 %	0 %	100 %
2009	8	50 %		1.5		50 %	0 %	100 %
2010	12					100 %	0 %	100 %
average	**7**			**2.1**	**5 %**			

MSc Offshore Engineering: International-student yield data. Reference date: January 20th, 2012.

cohort	cohort size	absolute cumulative MSc yield: relative to n years of study		average study duration	still enrolled	drop-out cumulative	maximum yi
		<= 2	<= 3				
2005	1	1		1.9		0	1
2006	1		1	2.1		0	1
2007	8	3	6	2.2		2	6
2008	11	3	8	2.2	3	0	11
2009	8	4		1.5	4	0	8
2010	12				12	0	12
average	**7**			**2.1**			

MSc Offshore Engineering: International-student yield data. Reference date January 20th, 2012.

cohort	cohort size	cumulative MSc dropout: relative to n years of study				
		<=1 year	<= 2 years	<= 3 years	<= 4 years	at date of referer
2005	1	0 %	0 %			0 %
2006	1	0 %	0 %	0 %		0 %
2007	8	0 %	13 %	13 %	13 %	25 %
2008	11	0 %	0 %	0 %	0 %	0 %
2009	8	0 %	0 %	0 %		0 %
2010	12	0 %	0 %			0 %

MSc Offshore Engineering: International-student drop-out data. Reference date January 20th, 2012.