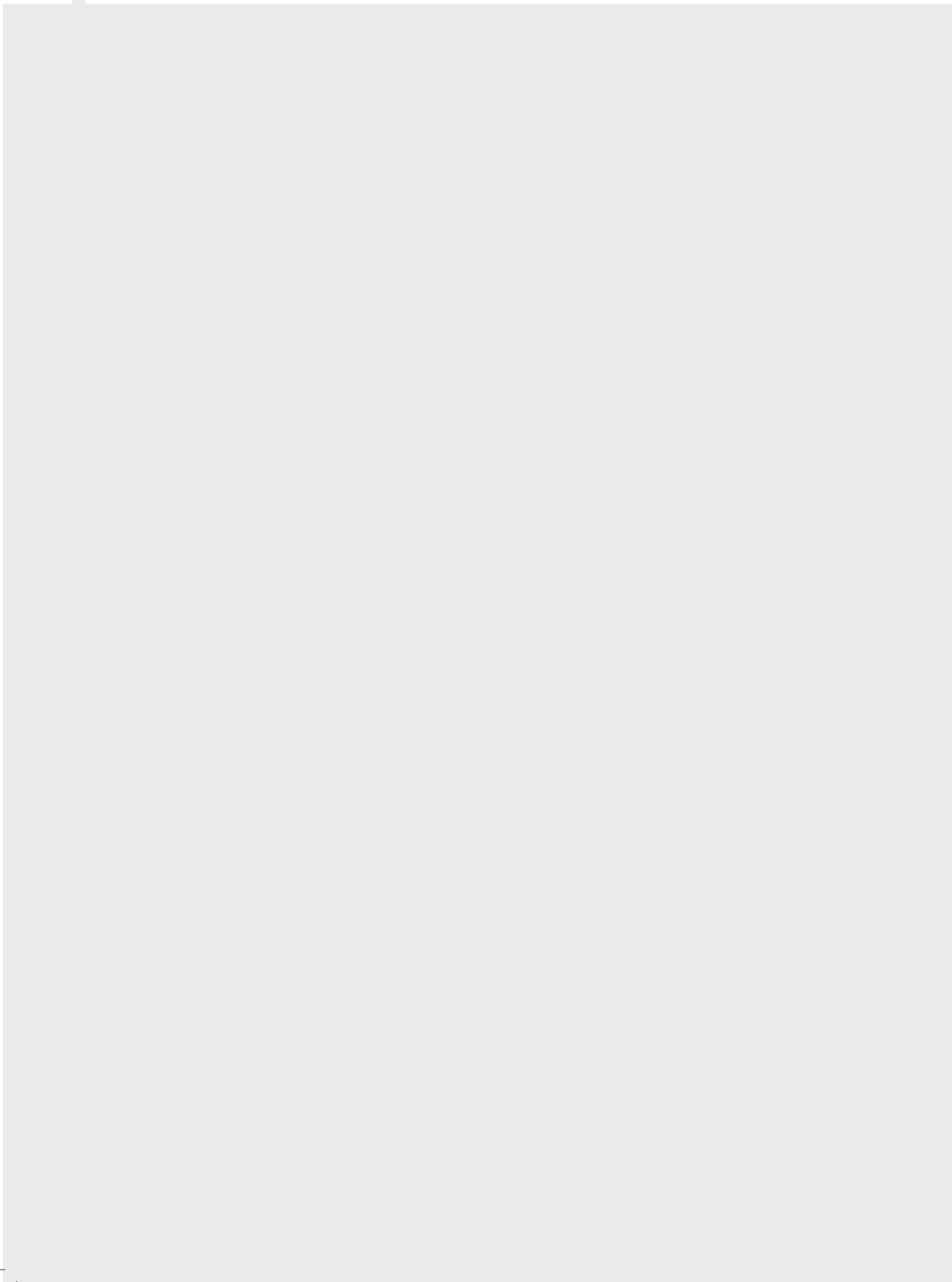
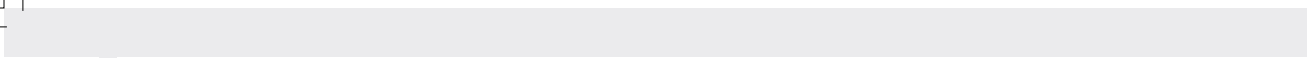


MT - Compass



Master **2003 - 2004**
MT-Compass
Study guide Master programme Marine Technology

Colophon

| | |
|-----------------|---|
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| Restriction | This study guide has been issued under responsibility of the Education Support Staff. Even though much care is taken with respect to the accuracy and completeness of this study guide, (programme) changes are possible. The most up to date information can be found on the website. http://www.wbmt.tudelft.nl |



Preface

The MT-compass is the primary information source for all existing and future MSc-students Marine Technology.

The guide has the same lay out as the previous course year. Some changes have been made:

- The study load for each course is no longer given in Dutch study points but in European Credits (EC). These credits are in line with the European Credit Transfer System (ECTS), which is used within the European Union in all higher education. One EC equals 28 hours of study, whereas the previous Dutch study point equalled 40 hours. The study load of one course year has been unchanged: 1680 hours. Consequently one course year equals 60 EC. The learning goals and contents of the different courses were not affected by ECTS. However because the study load is given as an integer number of EC, the nominal number of study hours may have changed marginally.
- The admission to the study programme has been enlarged. It is now possible for Bachelors of Science with a degree in Marine Technology, Applied Physics, Aerospace Engineering, Civil Engineering, Industrial Design Engineering or Mechanical Engineering to get entrance to the study programme. Also bachelors of a polytechnic high school with a relevant diploma can get entrance through a pre master programme.
- Course schedules have been included, so that all information for study planning can be found in the guide. It is no longer necessary to consult other documents to find the location, semester period and lecturing hours of a course.
- The new MT2000 study programme is fully implemented this course year 2003-2004. That means that new parts of the MSc-programme, such as the Mechatronics Project, the Maritime Business Game and the course on Design Methodology & Knowledge Engineering will be offered for the first time.

Much care has been given to publish correct information in this guide. Nevertheless sometimes it may be necessary to adapt course information or scheduling. In such a case the most up to date information can be found on the website <http://www.wbmt.tudelft.nl>.

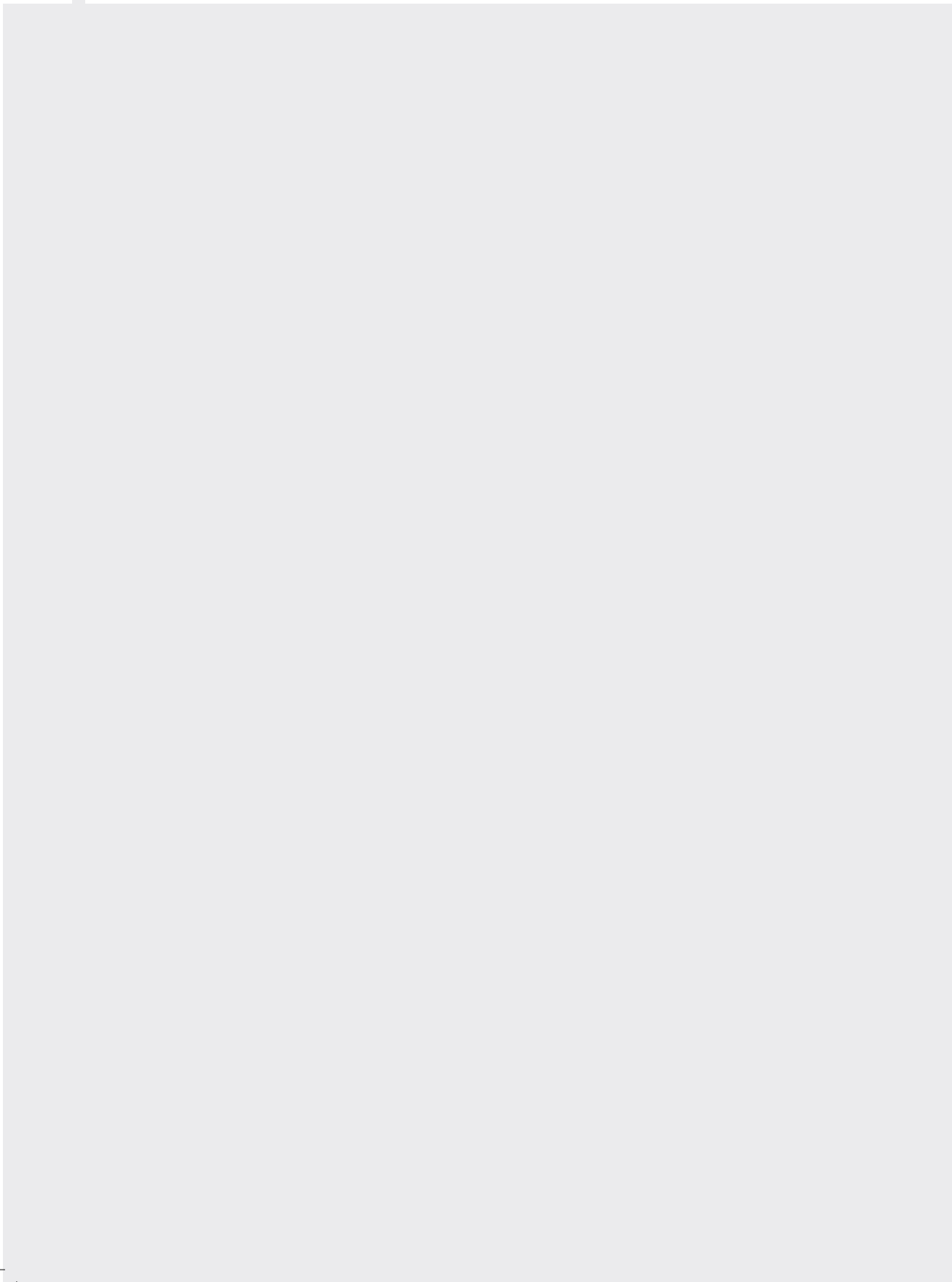
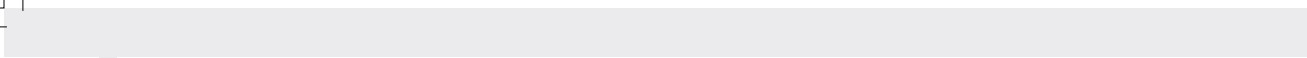
The editors of this guide wish all students a pleasant and successful study year.

prof. J. Klein Woud, MSc, FIMarEST.
Director of Education Marine Technology.

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MSc programme

Organisation

Facilities

Service for Students

Course descriptions

Appendices

MSc programme

1 MSc Marine Technology

1.1 Goal

The goal of the educational programme Marine Technology is to educate engineers Marine Technology (MSc), who have the following qualities:

- Broad and deep knowledge of the basic engineering sciences
- Broad basic technical and scientific knowledge of the Marine Technology disciplines: marine systems design, marine operations, marine hydrodynamics and structures, marine systems production
- Specialized in at least one Marine Technology discipline
- Ability to innovate, model and design marine systems
- Ability to contribute to solving multidisciplinary problems by means of a systematic approach, analysis and synthesis and to work both in multidisciplinary teams and independently in the international marine context
- Ability to communicate effectively with team members and environment
- Ethical conduct, taking responsibility with regard to sustainability, economy and social welfare
- Ability to maintain professional competence through life-long-learning-

1.2 Educational Concept and Assessment

The study programme involves two years of study, each with a study load of 60 EC (European credits). The total programme involves 120 EC.

Based on the choice of variant and specialization the master programme involves two major parts:

Lecture courses (50-70 EC)

These courses are divided in two parts:

- Obligatory courses variant (20 EC)
- Obligatory courses specialisation (15 EC)
- Elective courses (at least 15 EC).

The courses should include at least 6 EC social courses and 9 EC fundamental courses. Most courses are assessed by means of an oral or written examination.

Assignments (50 - 70 EC)

The assignments take place in the second year of the MSc-programme. In general the assignments are carried out individually.

The assignments may involve:

- An internship in industry or a project task defined in consultation with an external party (industry, research institute, etc.) of 15 EC. In case the MSc-thesis is performed in cooperation with and at the office of an external party this part of the programme may be combined with the MSc-thesis.
- MSc-thesis project (35 - 60 EC)
- If necessary other individual or group assignments

The assignments are assessed, based on a written report and possible on an oral presentation.

The MSc-thesis project is the final assignment in the MSc-programme.

The student prepares this thesis as a report of his/her research project. The thesis work is evaluated through an oral presentation by the candidate and an oral examination before an MSc examination committee composed of at least three scientific staff members, including the thesis supervisor. The examination committee may also include external examiners from research institutes or from industrial partners. In paragraph 1.5 the requirements for assignments are specified.

1.3 Study programme and general structure

Marine Technology offers a Master of Science course of two years.

Each course year is divided in two semesters. Every semester consists of two periods.

In this study guide, these periods will be referred to as 1A, 1B, 2A and 2B. A period consists of seven weeks of lectures, followed by two or three weeks in which tests can be scheduled.

Most examinations will be held orally. For those subjects where written examinations are taking place, the student will get at least one opportunity per year to do a resit. Resits generally take place in the first period after the regular period for a certain examination. Resits for the tests given in period 2B are scheduled in the second half of August.

The study load of a course is expressed in European Credits. This is a result of the European Credit Transfer System (ECTS), which encourages acknowledgement of study results between higher education institutions within the European Union. The study load for one study year is 60 EC. These EC give an indication of the weight of a certain part of the course. One EC involves approximately 28 hours of study. These 28 hours include all time spent on the course: lectures, self study, internship, assignments, examinations, etc.

1.4 Admission to the programme

There are several ways to be admitted to the MSc-programme Marine Technology. Usually the MSc-programme is a continuation of an academic BSc-programme, however the master's programme can also be entered after completing a Bachelor-programme of a polytechnic high school or Hoge Zeevaarschool.

Admission to the MSc-programme is described in the following two subsections.

1.4.1 Academic bachelor degree

Academic BSc-degree Marine Technology

Students holding an academic BSc-degree Marine Technology of Delft University of Technology can enter the MSc programme without selection.

A student in the BSc-programme is permitted to do examinations of the MSc-programme, if the examination committee approves. When the student has passed the propaedeutic examination and has a study result of the second and third year of at least 100 EC, including the BSc-thesis, the student can be conditionally admitted to the MSc-programme, to take part in examinations of a few MSc-courses. Final admittance is granted after completing the BSc-programme.

BSc-degree Mechanical Engineering, Civil Engineering, Aerospace Engineering, Industrial Design Engineering and Applied Physics

Students in this category can enter the MSc-programme without selection. In order to enter the MSc-programme additional courses have to be followed. These are courses of the BSc-programme Marine Technology of in total 20 EC or less and will be part of the elective courses of the chosen variant. For Bachelors Civil Engineering, Industrial Design Engineering and Applied Physics the additional programme involves maximum 40 EC, of which 20 EC will be part of the elective courses. The total programme will become then $120 + \max 20 = \max 140$ EC.

- Additional courses for Mechanical Engineering, Aerospace Engineering and Civil Engineering:

| | | |
|----------|---------------------------------|--------|
| - mt517 | Geometry and Stability of ships | 2 EC |
| - mt215 | Marine Engineering A | 2 EC |
| - mt518 | Resistance and Propulsion 1 | 2 EC |
| - mt519 | Ship motions and manoeuvring 1 | 1.5 EC |
| - mt731 | Ship Production 2 | 2 EC |
| - mt803 | Ship Constructions 2 | 3.5 EC |
| - mtp203 | Project 2-3: Design 1 | 5 EC |
| | Total | 19 EC |

For BSc-degree Civil Engineering two more additional courses are required:

- wb2104 Systems and Control Engineering 1 2 EC
- wb1126mt Thermodynamics 1 2 EC

Industrial Design Engineering and Applied Physics:

- In consult with the student adviser.

Other Academic BSc-degree Technical University

The contents of the BSc-degree and study results of each candidate will be evaluated. The intake-coordinator of the board of examiners is responsible for this selection. The selection procedure can result in:

- admission without additional requirements
- admission with additional requirements of less than 20 EC. This case is comparable to that of BSc-degree Mechanical Engineering, or Aerospace Engineering, as described above.
- admission with additional requirements between 20 and 40 EC. In this case 20 EC are part of the 120 EC of the regular MSc-programme and 20 EC at most are additionally required above the regular MSc-programme.
- no admission. The candidate has to obtain the Marine Technology BSc-degree first. Within the BSc-programme exemption for some courses is possible, depending on earlier education.

The student can be conditionally admitted to the MSc-programme, when the propaedeutic examination is passed and at least 100 EC of the second and third year of the BSc-programme have been obtained. Final admittance is granted after completing the additional courses.

1.4.2 Marine Technology Bachelor degree of Dutch polytechnic high school (TH) or "Hogere Zeevaartschool" (HZS)

A candidate can be admitted, if the candidate has completed the TH- or HZS- Bachelors-programme within 4 years, with good results. An number of additional courses, of the second year of the Marine Technology BSc-programme has to be followed:

These additional requirements will ensure that the student has at least an entrance level comparable to the second-course year of the Mechanical Engineering BSc-programme. The lecturer of the chosen variant and specialization may require that also a number of third year courses of the BSc-programme, in the field of the specialization is followed.

Candidates are admitted to the pre-MSc-programme. This means that both the pre-MSc-programme and MSc courses can be followed. Final admission to the MSc-programme is given after completing the pre-MSc-programme.

Courses are given in Dutch. A summary of additional courses and requirements is given below, in Dutch.

- De TH- en HZS-student mag tijdens het volgen van het aanvullende pakket al vakken volgen van de gekozen specialisatie van de MSc-variant en daarin tentamen doen.
- De TH- en HZS-student krijgt gezien zijn vooropleiding vrijstelling van de stage (15 EC).
- De HZS-student krijgt vrijstelling voor de MSc-eis van 6 EC Maatschappijvakken.
- In overleg met de specialisatie docent zal in het keuzedeel een aantal vakken opgenomen worden om het BSc- en MSc-niveau van de specialisatie te behalen.
- De totale studielast voor een TH-student komt hiermee op $28,5 + 120 - 15 = 133,5$ EC.
- De totale studielast voor een HZS-student komt hiermee op $43,5 + 120 - 21 = 142,5$ EC.

Coördinator voor de TH/HZS-instroom is Ir. Jaap van der Zanden.
Secretaris van de Examencommissie is Ewoud van Luik.



PRE-MASTER PROGRAMMA**Contact-uren p/w en tentamens
of EC per semester**

| Vakcode | Vaknaam | Docent | EC | 1A | 1B | 2A | 2B | Herk | TV | BEO |
|--------------------------------------|----------------------------|------------|------------------------|----------|-----------------------|-----------|------------|------|----|-----|
| VOOR TH- EN HZS-STUDENTEN | | | | | | | | | | |
| MT201TH WISKUNDE | | | 15 | | | | | | | ec |
| wi1152th | Analyse 1 TH | Tholen | 3 | 4t | ht | | | | s | dc |
| wi1153th | Analyse 2 TH | Tholen | 3 | | 4t | ht | | | s | dc |
| wi1154th | Analyse 3 TH | Tholen | 3 | | | 4t | ht | | s | dc |
| wi2256th d1 | Lineaire algebra 1 TH | Van Beek | 3 | 2 | 2t | ht | | | s | dc |
| wi2256th d2 | Lineaire algebra 2 TH | Van Beek | 3 | | | 4t | ht | | s | dc |
| MT202TH FUNDAMENTEEL | | | 13,5 | | | | | | | ec |
| et2019mt 1) | Elektrische aandrijvingen | Bauer | 3 | | 4t | ht | | | s | dc |
| mt806 | Sterkteleer 2 | Hommel | 3 | | | 4t | ht | | s | dc |
| mt825 | Inl. eindige element meth. | Hommel | 1,5 | | 2t | ht | | | s | dc |
| wb1113mt | Dynamica A | Wisse | 3 | 5t | ht | | | | s | dc |
| wb2104 | Systeem- en regeltechn. 1 | Dijkstra | 3 | | | 4t | ht | | s | dc |
| Totaal TH (HZS) | | | 28,5 (25,5) | 6 | 10,5 (7,5) | 12 | | | | |
| AANVULLING VOOR HZS-STUDENTEN | | | | | | | | | | |
| mt215 | Maritieme werktuigkunde A | Klein Woud | 2 | | 3t | ht | | | s | ec |
| mt517 | Geometrie en stabiliteit | Pinkster J | 2 | 3t | ht | | | | s | ec |
| mt518 | Weerstand en voortst. 1 | Terwisga v | 2 | | | 3t | ht | | s | ec |
| mt519 | Bewegingen en sturen 1 | Pinkster J | 1,5 | | 2t | ht | | | s | ec |
| mt731 | Scheepsproductie 2 | Dirkse | 2 | | | | 2t | ht | s | ec |
| mt803 | Scheepsconstructies 2 | Vink | 3,5 | | | | 4t | ht | s | ec |
| mtp203 | Project 2-3 Ontwerpen 1 | Boonstra | 5 | | | 5 EC 2) | | | p | ec |
| Totaal HZS | | | 43,5 | 2 | 3,5 | 7 | 5,5 | | | |

1) Niet voor HZS-studenten

2) Gezien de zwaarte van semester 2A wordt aanbevolen dit project in het 2e jaar verblijfsjaar aan te vangen.

Zie voor het college rooster appendix 6.6.

Slaagregels / toelichting afkortingen

- dc deeltcijfer; wordt meegerekend voor eindcijfer (ec) indien cijfers $\geq 4,5$ zijn.
- ec eindcijfer (op heel getal afgerond) ; wordt toegekend indien het gewogen gemiddelde van de daar-
onder vallende vakken is $\geq 6,0$. weefactor is het EC. In het MSc-programma (dus in het programma dat
aansluit op bovengenoemd "pre-MSc programma") mag 1 eindcijfer 5 in de vakken voorkomen.
- EC European Credits. 1 EC komt overeen met 28 uur studielast.
- s schriftelijk tentamen
- xt x uren college per week, gevolgd door tentamen/toets

1.5 MSc-programme Marine Technology

In order to enter the MSc-programme the student should compile a list of courses, which should be approved by the lecturer of the chosen specialization. This list should be filled in at a form, which can be acquired at the desk of the Education support staff and at the website.

In paragraph 1.2 the general requirements concerning the study programme are described.

Variants and specializations

There are 2 different variants and 7 specializations Marine Technology:

- 1 Science
 - 1.1 Ship Hydromechanics
 - 1.2 Ship and Offshore Construction

- 2 Design, Production and Operation
 - 2.1 Marine Engineering
 - 2.2 Ship Building
 - 2.3 Ship Design
 - 2.4 Shipping Management
 - 2.5 Offshore Units Design

Annotations

There are also 3 annotations, which can be done as a supplement to the variant programme:

- a Technical Marketing
- b Offshore Technology
- c Sustainable Development



1.5.1 Variant Science

Introduction

The development of new concepts of ships and other floating structures and the application of new construction materials require in-depth knowledge of and skills in the application of the fundamentals of hydrodynamics and structural strength. This is necessary since the design of novel structures generally cannot be based on past experience and existing concepts alone. Design based on the application of knowledge and skills with respect to first-principles are key words in this respect. The variant science is aimed at further development of such knowledge and skills under the assumption that the basics have been mastered in the bachelor phase of the program.

Mathematics, advanced hydrodynamics, properties of new materials, advanced methods of structural analysis as well as advanced ship concepts make up the main part of the variant science.

Within the science variant the student may select from following 2 specialisation subjects:

- Ship Hydromechanics
- Ship and Offshore Construction.

If preferred, the final year master project may cover both areas.

For the science variant, in the first year 20 EC are devoted to compulsory subjects which include selected topics from both the hydrodynamic and structural disciplines as shown in the table below.

Obligatory courses MSc variant

| Course code | Course name | Lecture hours | EC |
|--------------|----------------------------------|---------------|-----------|
| mt514 | Ship Motions and Manoeuvring 3 | 0/0/0/4 | 3 |
| mt523 | Numerical Methods for MT | 0/0/0/4 | 4 |
| mt835 | Hydro Structural Subjects | 0/0/4/0 | 3 |
| mt836 | Advanced Programming | 0/0/2/2 | 3 |
| wb2310 | System and Control Engineering 3 | 0/4/0/0 | 4 |
| wm0732mt | Maritime Law | 4/0/0/0 | 3 |
| Total | | | 20 |

Another 30-45 EC will be devoted to specific subjects selected in consultation with the head of the hydrodynamics or structural program. A part of these EC may be used for a internship in industry. This internship may also be fulfilled in the final year, such after consultation with the head of the department.

The final year masters project may be carried out in co-operation with industry, research institutes or in-house depending on the students preference and availability of positions in industry.

1.5.1.1 Specialisation Hydromechanics

| | | | |
|------------------|-------------------------------|-----------------|-------------------------------|
| | prof. dr. ir. J.A. Pinkster | +31 15 278 3598 | j.a.pinkster@wbmt.tudelft.nl |
| | prof. dr. ir. T. van Terwisga | +31 15 2786860 | t.vanterwisga@wbmt.tudelft.nl |
| | dr. ir. J.A. Keuning | +31 15 278 1897 | j.a.keuning@wbmt.tudelft.nl |
| Secretary | P.W. de Heer | +31 15 278 6873 | p.w.deheer@wbmt.tudelft.nl |

In the design and operation of ships and other floating structures, hydromechanics ,i.e. hydrostatics and hydrodynamics, play an increasingly important role. This role is increasing due to the fact that as time passes more numerical methods for predicting the behaviour of the vessel and of its propulsor are becoming available for use in evaluating a particular design or operation at an early stage of the development. As a final check on the performance of a ship model tests are often performed as in many cases computational methods, while giving an enormously increased insight in the effect of design parameters on the performance, do not always provide sufficiently accurate quantitative results for, for instance, contract purposes.

For the practicing hydrodynamicist, insight in the background of hydromechanic theory and the corresponding numerical methods used to generate practical data are indispensable. As a basis for understanding applied hydromechanics, knowledge and insight in the fundamental physics of ship/water and propulsor/water interaction as well as the underlying mathematical theories of hydromechanics are also necessary.

The specialization of Ship Hydromechanics in the master phase of the educational program is aimed at providing such knowledge and insight under the assumption that students have obtained the basic knowledge of ships and other floating structures and the processes involved in design, production and operation in the bachelor phase of the program.

On completion of the master phase in Hydromechanics, the student can look forward to applying his or her knowledge and skills in the marine industry or in research institutes active in the marine field.

The following components make up the master program:

First year:

- Mathematics
- Applied aerodynamics
- Numerical methods in hydromechanics
- Mathematical methods in hydromechanics
- Advanced marine vehicles
- Manoeuvring and Seakeeping behaviour of ships and other structures
- Propulsion and Resistance of ships

Second year:

- An internship with industry or at a research institute (6-10 weeks)
- Master project carried out either in co-operation with industry in the field of applied hydromechanics or a research project carried out at a research institute or in-house.

- MSc-thesis** Examples of recent master thesis projects:
- A theoretical and experimental investigation into the hydrodynamics of slamming of the bow-flare of ships
 - Dynamic motions analysis of a moored Kingsize Heavy Lift Vessel in waves
 - Analysis and optimization of 'DICAS', a closer look at the Differentiated Compliance Anchoring System
 - Wave-feed-forward in Dynamic Positioning using a real-time estimation of the wave field
 - Application of the Extended Maximum Likelihood Method (EMLM) in Wave Drift Force estimation
 - Design of a Cyclic Pitch Propeller for the Autonomous Underwater Vehicle S-COUT
 - Observations of a three-dimensional sheet cavity on a hydrofoil
 - Low-wash design of planing hulls
 - Experimental study on water motions in a moonpool
 - Surfing of sailing vessels in following seas
 - Realistic inflow conditions for numerical simulation of green water loading

Obligatory courses specialisation Ship Hydromechanics

| Course code | Course name | Lecture hours | EC |
|-------------|--------------------------------------|---------------|----|
| mt515 | Resistance and Propulsion 3 | 2/2/0/0 | 3 |
| mt524 | Hydromechanics of Special Ship Types | 0/0/4/0 | 3 |

Recommended elective courses specialisation Ship Hydromechanics

| Course code | Course name | Lecture hours | EC |
|-------------|--|---------------|----|
| ae2-115 | Aërodynamica B | | 3 |
| ae3-130 | Aërodynamica D | | 3 |
| ae4-151 | Num. Meth. in de vliegtuig-aërodynamica | | 3 |
| ct4130 | Probabilistisch ontwerpen | | 4 |
| mt218 | Mechatronics in Marine Technology | 0/0/4/0 | 5 |
| mt411 | Offshore Technology | 4/0/0/0 | 3 |
| wi1089HWBC | Partiële differentiaalvergelijkingen | | 3 |
| wi2090 | Continuüm mechanica I | | 5 |
| wi3025 | Continuüm mechanica II | | 6 |
| wi4007tu | Fourier- en Laplace-transformaties | | 4 |
| wi4011 | Numerieke stromingsleer | | 6 |
| wi4014tu | Numerical analysis c2 | | 6 |
| wi4048 | Mathematische methoden in de hydrodynamica | | 6 |

1.5.1.2 Specialisation Ship and Offshore Construction

| | | | |
|------------------|---------------|-----------------|----------------------------|
| | ir. G. Hommel | +31 15 278 6507 | g.hommel@wbmt.tudelft.nl |
| Secretary | P.W. de Heer | +31 15 278 6873 | p.w.deheer@wbmt.tudelft.nl |

Ever since the advent of "open" ships, Ro-Ro ships and offshore constructions, design has become one of the most important fields of study for the marine engineer. Together with the classification societies, the engineers concerned at shipyards and design agencies bear responsibility for shape, choice of materials, production technology and dimensioning of the connecting parts. An important complication in this is that the fracture safety in welded constructions does not exclusively relate to the calculated stresses.

A designer should always be looking for the impossible. Relatively new sciences, such as finite element calculations and fracture mechanics, are just as well parts of the curriculum as are the knowledge of the quality degeneration of materials as a result of welding and cutting or the suppression of vibration and noise pollution.

Because of the situation described above, there is a definite demand for all-round strength experts. At the moment the opportunities for employment agree with the order of the following list:

Firms of consulting engineers.

- Oil industry.
- Classification societies.
- Shipyards.
- Research institutes (e.g. TNO).
- Navy.

Within the section there are various specialisms which are reflected in the scientific research being carried out in the Ship Construction Laboratory.

The section mainly concentrates on the effects of the topology, material and fabrication influences (imperfections, residual stresses etc.) of a construction on its behavior under varying loadings due to the seaway (fatigue) and at low temperatures (brittle fracture). Furthermore, attention is paid to impact-resistance and plastic collapse under compression.

The section also occupies itself with the controlling of vibrations and noise, generated by the propeller, the engines, the pumps, the ventilation systems, waves, etc. Attention is paid to a practical and fundamental discussion of vibration problems. As vibrations and noise activate one another, the problems of producing, transmitting and reducing noise from source to recipient are considered as well.

During the 4th year course work and the completing of one's studies, there is ample opportunity to get involved in the ongoing laboratory research. Another possibility is the participation in practical projects.

MSc-thesis Examples of recent master thesis projects are:

- Numerical simulation of the impact strength of a Y-shaped shell structure during collision,
- Optimization of structural configurations for superstructures of mega-yachts,
- Research into the strength aspects of application of composites for sailing yachts,

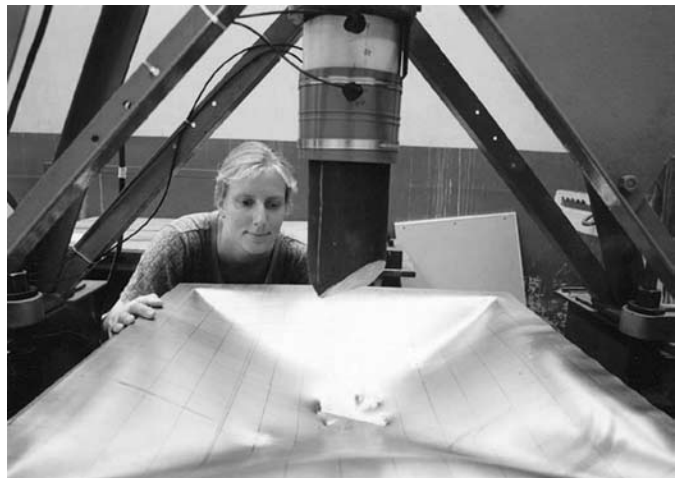
- Simulation of structural response in the bow flare region of ships under impact pressures in heavy seas,
- Assessment of the possibilities of the Hot Spot SN method for fatigue life prediction of welded aluminium details,
- Optimization of lightweight aluminium panels for application in shipbuilding,
- Analysis of defects in the construction of suction hopper dredgers,
- Verification of a damage evolution model for G.R.P. woven fabric laminates,
- Evaluation of the reliability of the hull girder of a FPSO with respect to ductile collapse,
- Fatigue life prediction for a typical structural detail in aluminium,
- Ultimate strength assessment of a chord-section for a leg of the LeTourneau jackup,
- Evaluation of the fatigue strength of an "egg box" type intersection of plates in HTS,
- Impact strength of aluminium panels.

Courses Ship and Offshore Construction

This specialization knows only two obligatory courses. After a consultation between student and supervisor, a curriculum is drawn up from the wide range of elective courses the university has to offer. The students wishes and expectations with respect to his/her future job and, if possible, his/her final project, are taken into account.

Obligatory courses specialisation Ship and Offshore Constructions

| Course code | Course name | Lecture hours | EC |
|-------------|---|---------------|----|
| mt815 | Ship Construction and Strength Special Subjects | 0/0/3/0 | 2 |
| mt830 | Application of FEM | 0/0/0/4 | 3 |



Recommended elective courses specialisation Ship and Offshore Constructions

| Course code | Course name | Lecture hours | EC |
|-------------|--|---------------|----|
| ae3-525 | FEM in constructies | | 3 |
| ae4-528 | Computerized structural analysis | | 3 |
| ae4-533 | Stab. v Dunwandige Constr. I | | 4 |
| ae4-534 | Stab. v Dunwandige Constr. II | | 3 |
| ae4-535 | Constr. Ontw. & Optimalisatie A | | 3 |
| ae4-535 | Constr. Ontw. & Optimalisatie B | | 3 |
| ct4130 | Probabilistisch ontwerpen | | 4 |
| ct5126 | Vermoeiing | | 3 |
| ct5122 | Capita selecta: staal, alumin, vvk | | 4 |
| mk2411B | Bezwijkgedrag: Breukleer | | 3 |
| mk3411A | Bezwijkgedrag: Plasticiteit | | 3 |
| mk5171 | Lastechnologie | | 3 |
| mk5641 | Breukmech. Concepten bij Schadeanalyse | | 3 |
| mt212 | Marine Engineering B | 2/0/0/0 | 3 |
| mt213 | Marine Engineering C | 0/2/0/0 | 2 |
| mt218 | Mechatronics in Mar. Technology (not in 2002/2003) | 0/0/4/0 | 4 |
| mt411 | Offshore Technology | 4/0/0/0 | 3 |
| mt515 | Resistance and Propulsion 3 | 2/2/0/0 | 3 |
| mt524 | Hydromechanics of Special Ship Types | 0/0/4/0 | 3 |
| mt814 | Ship Vibrations and Noise | 0/0/0/4 | 3 |
| mt816 | Composite Materials for Ship Construction | 0/0/0/2 | 2 |
| ot4623 | EEM voor Offshore Technologie | | 4 |
| wb1402A | Plates and Shells A | 2/4/0/0 | 4 |
| wb1405A | Stability of Thinwalled Structures I | 0/0/4/2 | 4 |
| wb1406 | Experimental Mechanics | 0/0/2/2 | 3 |
| wb1409 | Theory of Elasticity | 2/2/0/0 | 3 |
| wb1412 | Non Linear Vibrations | 0/0/2/2 | 3 |
| wb1416 | Num. Methods for Dynamics | 0/0/2/2 | 3 |
| wb1430A | Intr. to Fibre Reinf. Plastics | 2/2/0/0 | 3 |
| wb1430B | Fibre Reinf. Plastics: ext. course | 0/0/4/4 | 6 |
| wb1432 | Mechanics of F.R.P. | 2/2/0/0 | 4 |
| wi3025 | Continuum Mechanica II | | 6 |

1.5.2 Variant Design, Production and Operation

The variant forms the basis of a number of specialisations, which each give ample possibilities to combine in-depth technical studies with other more general aspects, such as logistics, management, finance, technical marketing and sustainability. As such, the variant is tailored at students of the applied maritime sciences. It will be of interest to students aiming at being an allround maritime graduate rather than a specialist.

This variant covers the following specialisations:

- Marine Engineering
- Shipbuilding
- Ship Design
- Shipping Management
- Offshore Units Design

which may be combined with the following annotations:

- Technical marketing,
- Sustainability.

The variant covers 22 EC of obligatory courses spanning a wide range of subjects of interest for students of this variant. These are shown in the table below.

Obligatory courses MSc variant

| Course code | Course name | Lecture hours | EC |
|--------------|--|---------------|-----------|
| mt217 | Design Methodology & Knowledge Engineering | 2/0/0/0 | 4 |
| mt218 | Mechatronics in Maritime Technology | 0/0/4/0 | 5 |
| mt411 | Offshore Technology | 4/0/0/0 | 3 |
| mt726 | Project Management | 0/4/0/0 | 4 |
| wm0732mt | Maritime Law | 4/0/0/0 | 3 |
| | Maritime Business Game | 0/0/0/4 | 3 |
| Total | | | 22 |



1.5.2.1 Specialisation Marine Engineering

| | | | |
|------------------|-------------------------|----------------|--------------------------------|
| | Prof. ir J. Klein Woud | +31 15 2781556 | j.kleinwoud@wbmt.tudelft.nl |
| | Ir ing. H.T. Grimmelijs | +31 15 2782746 | h.t.grimmelijs@wbmt.tudelft.nl |
| Secretary | Ing. O. van Lent | +31 15 2786564 | o.vanlent@wbmt.tudelft.nl |

Marine Engineering is the discipline that covers the design, installation and operational use of ship machinery and electrical plants. It covers a wide variety of systems, such as: ship propulsion plants, electric power generation, refrigeration and climate control, auxiliary systems for cooling and lubrication, cargo handling, loading and unloading. The main issue is "installation technology": integration of different equipment to well functioning, efficient and cost effective systems. It requires extensive knowledge of machinery and electrical equipment (principle of operation and characteristics such as controllability and maintainability) as well as of fluid dynamics, mechanical vibrations and strength, thermodynamics, reliability and maintainability. The design of the equipment to be installed is not a main topic of study.

The students specialising in marine engineering have a wide choice with regard to elective courses. Approximately 36 EC can be used for elective courses. The master thesis covers 60 EC and will frequently be performed in co-operation with industry or an external research institute. The specialisation has good contacts with universities abroad, which gives the opportunity to perform a part of the study (courses or the master's thesis) abroad.

MSc-thesis The master thesis will be performed on one of the research topics on which the section is active:

- Investigation in the dynamic behaviour of machinery systems. To realise this, much effort is paid to the development simulation models of equipment and systems and the dynamic simulation of complete systems;
- Maintenance engineering. Work is done on the development of cost effective and safe maintenance plans as well as on intelligent condition monitoring. Use is made of artificial intelligence and also system simulations;
- Development of new design tools and innovative system designs;
The master thesis may have a practical as well as a more fundamental theoretical nature.

Examples of recent master thesis projects are:

- Development of a simulation model of a dredging pump;
- Technical and economical investigation into an all-electric ship (AES) concept for a chemical tanker;
- Model development and simulation of the dynamic behaviour of a complete propulsion system (engine, propeller and ship) in a heavy seaway;
- Sensor monitoring with the help of neural networks;
- Development of an economical decision model for spare parts to be carried on board.

Obligatory courses specialisation Marine Engineering

| Course code | Course name | Lecture hours | EC |
|-------------|----------------------|---------------|----|
| mt212 | Marine engineering B | 2/0/0/0 | 3 |
| mt213 | Marine engineering C | 0/2/0/0 | 2 |

Recommended elective courses specialisation Marine Engineering

| Course code | Course name | Lecture hours | EC |
|-------------|--|---------------|----|
| ae4-496 | Maintenance technology | 0/0/2/2 | 3 |
| in4013tu | Expert systems in a technical environment | 0/2/2/0 | 4 |
| tn3713 | Advanced thermodynamics | 0/0/2/2 | 3 |
| wb1321 | Heat and mass transfer | 0/0/4/0 | 3 |
| wb1413 | Multi – body dynamics | 0/0/2/2 | 3 |
| wb2310 | System and control technology 3 | 0/4/0/0 | 4 |
| wb2311 | Introduction to modelling | 4/0/0/0 | 3 |
| wb2400 | Process control | 0/0/2/2 | 3 |
| wb2402 | Hydraulic servo systems | 2/2/0/0 | 3 |
| wb4408A | Diesel engines A | 0/0/2/2 | 4 |
| wb4408B | Diesel engines B | 2/2/0/0 | 4 |
| wb4410A | Refrigeration fundamentals | 2/2/0/0 | 3 |
| wb4420 | Gas turbines | 2/2/0/0 | 3 |
| wb4421 | Gas turbines simulation and application | 0/0/2/2 | 3 |
| wb4424 | Indoor climate control design | 0/0/2/2 | 4 |
| wb4426 | Indoor climate control fundamentals | 0/0/2/2 | 3 |
| wb4427 | Refrigeration technology and applications | 0/0/2/2 | 3 |
| wi3021tu | Applied statistics B | 0/0/2/2 | 4 |
| wi4019 | Non-linear differential equations | 0/4/0/0 | 6 |
| wi4052 | Risk analysis | 0/0/2/2 | 3 |
| wm0301tu | Introduction to philosophy for technologists | 0/2/0/0 | 3 |
| wm0324lr | Ethics and technology LR | | 3 |
| wm0801tu | Introduction to safety: methods and techniques | 0/4/0/0 | 3 |
| wm0903tu | Technology and global development | 0/0/2/2 | 4 |
| wm0909tu | Technology assessment | 0/0/2/2 | 3 |
| wm1102tu | Written English for technologists | | 3 |

1.5.2.2 Specialisation Shipbuilding

| | | | |
|------------------|---------------------------|----------------|-----------------------------|
| | Prof. dr. ir. U. Nienhuis | +31 15 2785306 | u.nienhuis@wbmt.tudelft.nl |
| | Ir. C. Dirkse | +31 15 2784057 | c.dirkse@wbmt.tudelft.nl |
| Secretary | Mrs. A. Nieuwland-Jobse | +31 15 2783882 | a.nieuwland@wbmt.tudelft.nl |

Shipbuilding covers all subjects related to the newbuilding, modification, repair, maintenance and scrapping of ships, offshore platforms and other floating maritime objects. It covers the entire process, starting from its product definition as given by the design, through the production itself and the delivery to the client, to the ensuing warranty and ultimate scrapping.

Important areas of interest are:

- The technical processes involved in the various production steps, from engineering through prefabrication to assembly and conservation;
- The production tools used for all the process steps, including CAM, ICT and robotics;
- The mutual dependence the design of the product (ship) and the processes (yard) to fabricate it and the consequent optimisation of the latter;
- The production factors and constraints involved in shipbuilding, such as labour, technology, environmental considerations, access to capital etc;
- The building strategies ranging from 'doing all in-house' through sub-contracting and co-makership to large-scale outsourcing; and from largely labour-dominated to fully automated work methods;
- The flow of materials, information and people in the process and all the interactions that take place;
- The logistics and management involved in such complex processes, including project management, organisational behaviour, general management, negotiating and resolving conflicts;
- The financial and legal issues involved in building ships, from labour relations to contracts and financing arrangements to financial analysis of shipyard performance;
- The dynamics of the world-wide shipbuilding and repair market including price developments, newbuilding volumes, globalisations, subsidies, niche-markets, second-hand pricing, etc;
- Decision-making processes to harmonise all of the above and develop strategically sound approaches to various problems.

Shipbuilding involves building mobile objects in a transparent, global market and thus is faced with world-wide competition in which the various production factors and the efficiencies decide the success of an individual company. Ships are complex objects, invariably made as a one-of or in very small series. The fact that ships operate in harsh environments and must be able to be autonomous for many weeks and sometimes months, leads to a multitude of different systems which all must be fitted harmoniously to each other and to the (steel or aluminium or composite) structure of the ship. Graduates in shipbuilding are expected to be able to oversee this complex process at the various levels of aggregation and synthesise the various aspects into a sound decision-making model.

Research

The research of the section "Shipbuilding" is focussed on:

- Identifying the parameters which impact on the various parts of the 'shipbuilding' system and investigating the cause and effect relations between the relevant parameters;
- Researching the qualitative and ultimately as much as possible quantitative models describing the relations;
- Researching the optimal management and control strategies to streamline and rationalise the processes;
- Developing the methodology and technology for the proper application of the research results in practical situations.

The precise choice of topics is of course driven both by the expected mid-term and long-term developments in basic technology and the way the industry is expected to unfold. The research is co-ordinated within a single DUT-research programme, entitled "Intelligent Shipbuilding & Shipping Processes", for which the description is available on the internet. In this programme the section co-operates intensively with the sections of Ship Design and, for the part of shipping, the University of Antwerp – ITMMA.

Based on this research core the section participates in industrially relevant, applied research. While the Dutch shipbuilding sector is the prime partner in the research and education, the horizon of the section stretches across Europe into the global market of shipbuilding. Typical examples of recent research projects are:

- Developing robots for the building of mid-size and small ships in small series;
- Planning and job-preparation on ship repair yards;
- 3D photographic measuring techniques for ship repair;
- Exploitation models for inland shipping;
- Establishing a development strategy for the Dutch shipbuilding industry.

Within the scope of a long-term research effort in co-operation with the Dutch industry the following projects will be undertaken together with other major players:

- Concurrent engineering;
- Virtual prototyping;
- Product-data modelling and design tools (in co-operation with the section of Ship Design);
- Optimisation of the match between product and process;
- Standardisation and modularization;
- Robotisation of various tasks, not limited to welding;
- Supply chain optimisation between yard and suppliers.

Shipbuilding and its research require the synthesis of many facets. Since the section does not aim at specialised, but vital technologies such as ICT and robotics, co-operation with specialised groups within and outside the DUT is explicitly pursued.

Other maritime fields covered by the section

Next to the core activities as highlighted above, the section provides specialist knowledge and courses on:

- Inland shipping;
- Salvage, which are taught at the MSc-level and also may serve as the basis for specific graduation research work.

MSc-thesis

Thesis subjects preferably, but not necessarily, fit the focal area of the section's research programme. The relations with industry not only benefit the mentioned research but also serve as interesting placements for graduation work.

Obligatory courses specialisation Ship Building

| Course code | Course name | Lecture hours | EC |
|-------------------|--------------------------------|---------------|----|
| mt728 | Ship repair and salvage | 0/0/2/0 | 3 |
| wm0504tu/wm0505tu | Industrial organisation A or B | 4/0/4/0 | 3 |

Recommended elective courses specialisation Ship Building

| Course code | Course name | Lecture hours | EC |
|-------------|---|---------------|----|
| mt724 | Ship finance | 0/0/2/0 | 2 |
| mt725 | Inland shipping | 0/2/0/0 | 2 |
| | Labour and organisational psychology * | | |
| | Transport, routing and scheduling | | |
| | Logistics | | |
| | Planning techniques | | |
| | Shipyards process simulation and strategy | | |
| | Financial management | | |
| | Operations research | | |
| | Robotics | | |
| | Materials | | |
| | Composites | | |
| | Fabrication techniques and welding | | |
| | Information and communication systems | | |
| | Data-base management | | |



1.5.2.3 Specialisation Ship Design

Prof.ir. A.Aalbers +31 15 2781732 a.aalbers@wbmt.tudelft.nl
 ir. H.Boonstra +31 15 2781521 h.boonstra@wbmt.tudelft.nl

The design of vessels can be characterised as reaching a synthesis of knowledge in order to design a vessel which can be operated in an optimal, economical way in a harsh Marine environment. The thesis is generally done in co-operation with maritime oriented companies like yards, ship owners etc. This unique approach creates the opportunity to study and develop actual subjects. On top of this it guarantees a thesis based on recent technical and economical information.

Subjects for a thesis could be:

- MSc-thesis**
- Design of a ship a maritime construction or a part of it;
 - Development of a design method for a new ship-type or a part of it;
 - Development and creation of design tools;
 - Calculation of the economical performance of the designs using optimisation methods.

Some titles of executed thesis studies are:

- The development of a new multifunctional salvage vessel for big salvage operations at sea;
- A design study of a 2.2 million barrel oil tanker with double skin;
- The influence of the tank arrangement on the design of chemical tankers;
- The design of seagoing container vessels with a dedicated transfer system towards inland barges;
- Concept exploration model for semi-submergible platforms;
- Design study for a single-point moored tanker for the oil production.

Some typical research areas of the department self are safety and environment, CAD/CAM design and calculation models and the design of advanced marine vehicles.

Jobs will be found in the following types of companies:

- Shipyards;
- Independent engineering offices;
- Ship owners;
- Royal Navy;
- University.

Because the design of vessels is actually the most multidisciplinary direction of all within Marine Technology, it enables people to find a broad area of possible employers.

Obligatory courses specialisation Ship Design

| Course code | Course name | Lecture hours | EC |
|-------------|--------------------------------|---------------|----|
| mt112 | Ship design 3 | 4/0/0/0 | 3 |
| mt113 | Ship design 4 | 0/4/0/0 | 3 |
| mt514 | Ship motions and manoeuvring 3 | 0/0/0/4 | 3 |
| mt515 | Resistance and propulsion 2 | 2/2/0/0 | 3 |

Recommended elective courses specialisation Ship Design

| Course code | Course name | Lecture hours | EC |
|-------------|-------------------------------------|---------------|----|
| mt213 | Marine engineering C | 0/2/0/0 | 2 |
| mt816 | Composite materials in shipbuilding | 0/0/0/x | 2 |
| wb3410-03 | Large-scale transportation systems | 0/0/2/0 | 3 |
| wb3413 | Dredging processes 1 | 2/2/0/0 | 4 |
| wb3414 | Dredging processes 2 | 0/0/2/2 | 4 |
| wm0102tu | Psychology of work | 0/0/2/2 | 3 |
| wm0504tu | Industrial organisation A | 4/0/0/0 | 3 |
| wm0610tu | Micro-economics | 2/0/0/0 | 2 |
| wm0611tu | Cost information | 0/2/0/0 | 2 |

1.5.2.4 Specialisation Shipping Management

| | | | |
|------------------|---------------------------|----------------|---------------------------|
| Professor | Prof.dr. E. van de Voorde | +32 3 220 4157 | eddy.vandevoorde@ua.ac.be |
| Deputy | Ir. J. Frouws | +31 15 2786606 | j.frouws@wbmt.tudelft.nl |

The specialisation is a joint activity of TU Delft and the Institute of Transport & Maritime Management (ITMMA) of Antwerp University. Prof. Dr. E. van de Voorde of ITMMA heads the specialisation, while the co-ordination is in the hands of ir J.W. Frouws (TU Delft). The Chair in Shipping, Ship Innovation and Shipping Management is part of the section Design of Ships.

The Chair started in 1973, under responsibility of Prof. ir. Dijkshoorn. When he retired, in 1988, 43 students had graduated. Since 1988 95 engineers have graduated, and hundreds of students from several faculties have attended the lectures. Also, some students from the department of Logistics Engineering and from Mechanical Engineering have graduated with the chair.

Marine Technology is a department that teaches their students how to design a ship for a mission, e.g. cargo transport or services. One piece in the process that translates the mission into a new ship, is determining the demands made on the ship. These demands come from international and national organisations, like IMO, Lloyd Register or Scheepvaartinspectie. Just as important, however, are the demands made by the market and the customers.

The last category is par excellence the field of the Chair in Shipping, Ship Innovation and Shipping Management. This specialisation concentrates on the use of the ship, and the demands this makes on the ship. This generates questions like:

- What will I use my ship for?
- What ship type should I use?
- Do I order a dedicated ship type, e.g. an oil tanker, or a combination carrier, e.g. an OBO carrier?
- What size must my ship be?

- Will I buy a new ship or a second-hand one?
- Where will I build my ship: In the Far East or in Europe?
- May a new concept ship design be necessary?

This is only a small number of the questions that concerns a ship owner. To give a good answer to these questions, the ship owner must observe his environment very carefully. He will consider whether there is a need for his service and whether there is enough demand for cargo capacity to make his ship profitable. To achieve this, he makes market analyses, studies of cargo flows and observes his competition.

The ship owner may concentrate on a large market, like the oil market or the bulk market, but he may also concentrate on a niche market, like heavy lift transport. In the first case he is one of the many players and he has little influence on the market, in the second case he is an important player with a high level of specialisation. Both market types have advantages and disadvantages, and both have their specific effects on the ship design. Niche markets often require specialised, advanced ship types.

Ship owners consider the design of ships from the viewpoint of shipping. Without knowledge of shipping, the exploitation of ships, the shipping world, cargo markets, financing, freight markets, etc., one cannot design a good ship. Innovations in ship design are often initiated by the maritime world and are not necessarily technology-driven.

The shipping engineer shapes new opportunities, supported by the knowledge from this complex environment.

A ship owner should try to distinguish himself from his competitors and this way establish a better competitive position. An example is the HSS of Stena Line, which, with a speed of 40 knots, makes the passage between Holyhead and Dun Laoghaire much faster. This is not only beneficial for the passenger, but it also means that the ship owner can better utilise his ship. Instead of one crossing per day, he may be able to make two crossings per day with only one ship. This is a way to increase revenues and profits, in spite of the higher building and operating costs of the ship. The concept is so successful that in Stena has decided to perform also the service between Harwich and Hook of Holland with this type of vessel.

Most graduates from the chair work in the shipping industry, e.g. for ship owners, transport companies, ship financiers, maritime researchers, government, etc. They have united in the NVVR (Nederlandse Vereniging van Rederijkundigen) and keep in touch regularly.

Obligatory courses specialisation Shipping Management

| Course code | Course name | Lecture hours | EC |
|-------------|-------------------------|---------------|----|
| mt313 | Shipping management | 0/0/0/4 | 3 |
| wb3420-03 | Logistics: introduction | 0/0/2/2 | 3 |

Recommended elective courses specialisation Shipping Management

| Course code | Course name | Lecture hours | EC |
|-------------|---|---------------|----|
| mt112 | Ship design 3 | 4/0/0/0 | 3 |
| mt113 | Ship design 4 | 0/4/0/0 | 3 |
| wb3417-03 | Discrete systems: modeling, prototyping, simulation & control | 2/2/0/0 | 4 |
| wi4070tu | Digital simulation A | 4/0/0/0 | 4 |
| wm0605tu | Business economics for engineers | 2/0/0/0 | 4 |
| wm0611tu | Cost information | 0/2/0/0 | 2 |
| ct4330 | Ports and shipping lanes 1 | | |
| ct5306 | Ports and shipping lanes 2 | | |

1.5.2.5 Specialisation Offshore Units Design

Ir. H. Boonstra +31 15 2781521 h.boonstra@wbmt.tudelft.nl

This specialisation is part of the section Design of Ships.

The Maritime Offshore is active with the design of floating structures, which can be used for industrial activities at sea. Examples of existing floating or sinkable constructions are: semi submersibles, tension leg platforms, self-rising islands, one point moored tankers etc. the industrial activities executed on board of these structures are often a result of oil and gas exploration of the seas. Other activities are dredging, mining, energy production and civil building or salvage operations. This discipline focuses on the design of constructions and integration of certain specific hydrodynamic and structural aspects in these kind of constructions.

Very often is one of the more specific disciplines the leading factor in the design of the structure. In that case a combination is made between the specific chair for example construction or hydrodynamics and design. In that case the student finalises his study under the responsibility of two chairs.

General fields of study are:

- Design of units or a part of it;
- Feasibility studies of new concepts;
- Development of design tools;
- Optimisation (technically and/or economically) of units.

MSc-thesis Typical examples of subjects for thesis are:

- Development of a computer program for the analysis of jack-up platforms;
- Design aspects of dynamic positioned "weather-vaning" production platforms;
- Design of unmanned booster stations;
- Design tools for the conceptual design of semi submersibles;
- Design of a construction for the installation of sub-sea equipment.

Jobs are normally found in engineering offices, oil-companies, yards, classification societies, research institutes and construction companies etc.

Obligatory courses specialisation Offshore Units Design

| Course code | Course name | Lecture hours | EC |
|-------------|---------------------------------|---------------|----|
| mt112 | Ship design 3 | 4/0/0/0 | 3 |
| mt113 | Ship design 4 | 0/4/0/0 | 3 |
| mt514 | Ship motions and manoeuvring 3 | 0/0/0/4 | 3 |
| ot4652 | Floating offshore constructions | 0/4/0/0 | 3 |
| ot4652 | Offshore moorings | 0/0/4/0 | 3 |

Recommended elective courses specialisation Offshore Units Design

| Course code | Course name | Lecture hours | EC |
|-------------|---------------------------------------|---------------|----|
| mt213 | Maritime engineering C | 0/2/0/0 | 2 |
| mt816 | Composite materials in shipbuilding | 0/0/0/2 | 2 |
| mt830 | Application of finite element methods | 0/0/0/4 | 3 |
| wb3410-03 | Large-scale transportation systems | 0/0/2/0 | 3 |
| wb3413 | Dredging processes 1 | 2/2/0/0 | 4 |
| wb3414 | Dredging processes 2 | 0/0/2/2 | 4 |
| wm0102tu | Psychology of work | 0/0/2/2 | 3 |
| wm0504tu | Industrial organisation A | 4/0/0/0 | 3 |
| wm0610tu | Micro-economics | 2/0/0/0 | 2 |
| wm0611tu | Cost information | 0/2/0/0 | 2 |



1.5.3 Annotations

As an addition to the variant programme there are three annotations, to broaden the knowledge on a certain subject. After completing such an annotation, the student gets a supplement to the MSc-degree, which declares a more than average knowledge about that subject. These annotations are:

- a Technical Marketing
- b Offshore Technology
- c Sustainable Development

The study programme, including an annotation, has to comply with the requirements of paragraph 1.2 (120 EC).

Annotation Technical Marketing

The Technical Marketing annotation offers students the possibility to get knowledge and skills in a more commercial direction. The study programme is meant for students, who want to prepare themselves for a technical commercial function (sales, marketing), in the area of their variant and specialisation.

The study programme will be determined in consultation between student, lecturer responsible for the chosen variant and specialisation and the responsible lecturer for Technical Marketing (prof. mr. dr. ir. Sicco S. Santema). The marketing component in the study programme consists of at least 10 EC marketing courses and 16 EC of the MSc- thesis should be devoted to marketing aspects. This means that a major part of the elective courses has to be used for technical marketing. The marketing content of the MSc- thesis should be complementary to the chosen variant and specialisation. Normally this part involves a marketing research study, for products, which still have to be developed, or a market introduction study, for developed products, but not yet introduced into the market. At the end of the MSc- thesis integration between marketing and technology will take place. This will result in a synthesis report.

Both the lecturer of the chosen variant and specialisation and a technical marketing lecturer will guide the student.

The responsible lecturer for Technical Marketing is prof. mr. dr. ir. Sicco C.Santema (phone +31 15 27 83076; e-mail S.C.Santema@io.tudelft.nl).

Obligatory courses annotation Technical Marketing

| Course code | Course name | Lecture hours | EC |
|--------------|---------------------------------------|---------------|-----------|
| ID4141 | Consumer research | 0/0/3/3 | 6 |
| ID5131 | Business marketing for engineers | 0/0/2/0 | 3 |
| IDE511 | Integral aspect of business marketing | 0/0/0/4 | 3 |
| Total | | | 12 |

Annotation Offshore Technology

The Participant's guide to the interfaculty Offshore Technology MSc curriculum can be obtained from DICOT (W.W. Massie MSc, tel. +31 15 27 84614).

The Offshore Technology annotation offers students the possibility to get knowledge and skills with regard to the complete field of offshore engineering. It is an interfaculty study programme, which is offered via the Delft Interfaculty Centre for Offshore Technology (DICOT). The annotation can be obtained in combination with a number of variants and specialisations.

The study programme will be determined in consultation between student, lecturer responsible for the chosen variant and specialisation and the responsible lecturer for Offshore Engineering (prof. Meek or W.W. Massie). The offshore component in the study programme consists of at least 35 EC offshore courses and the master thesis



should be devoted to an offshore technology subject. This means that the elective courses have to be used for offshore engineering; some of the obligatory courses for the chosen variant and specialisation may be left out in consultation with the lecturers. The offshore content of the master thesis should be complementary to the chosen variant and specialisation.

Both the lecturer of the chosen variant and specialisation and an offshore lecturer will guide the student.

Obligatory courses annotation Offshore Technology

| Course code | Course name | EC |
|-------------|-------------------------------|-----------|
| ot4600 | Survey of offshore technology | 10 |
| ot4615 | Oceanography and waves | 6 |
| ct4130 | Probabilistic design | 4 |
| ot4620 | Offshore hydromechanics | 7 |
| | total | 27 |

Elective courses annotation Offshore Technology (at least 8 EC)

| Course code | Course name | EC |
|-------------|---|----|
| ot4624 | Offshore soil mechanics | 3 |
| ot4651 | Bottom founded structure design | 6 |
| ot4652 | Design of floating structures | 4 |
| ot4653 | Subsea engineering and marine pipelines | 4 |
| ot4561 | Offshore moorings | 4 |
| ot4654 | Subsea engineering design | 4 |
| ot4662 | Offshore windfarm design | 4 |

Annotation Sustainable Development

Sustainable development is becoming of increasing importance. Questions are: "What does the world look like in 50 years?" or: "What should the world look like in 50 years?". The curriculum is based on elective courses, a colloquium and the MSc-Thesis. The aim of the colloquium is to develop broad knowledge of all kinds of environmental and technical issues and to place this in perspective.

- colloquium in sustainable development of 3 EC
- Courses to be chosen from the following two clusters (at least 6 EC from each cluster):
 - Technology and Design
 - Organisation and society
- MSc-thesis, which shall be devoted also to sustainable development. The coordinator shall approve the problem formulation of the thesis and the extent to which sustainable development is integrated into the thesis. The coordinator shall further determine whether the theme of sustainable development has been sufficiently integrated into the problem formulation, the execution of the project and the project report.

Further information on the available courses can be obtained at the website <http://www.odo.tudelft.nl> and from ir. J.W. Frouws (phone: 015 27 86606, email: j.w.frouws@wbmt.tudelft.nl), who is the coordinating lecturer for Marine Technology, with regard to sustainable development.

For enquiries concerning the colloquium and enrolling: Gertjan de Werk, g.dewerk@tbm.tudelft.nl.

1.5.4 Technical University Teacher Course (TULO)

Graduated Masters of Science Marine Technology, Mechanical Engineering or Maritime Technology have the opportunity to participate in a special course to become a high school teacher in science or mathematics.

There is a standard course, which includes 60 EC. A maximum of 30 of these points can be integrated in the MSc study programme, the other, at least, 30 points have to be earned in a post MSc course.

For more information on admission to the programme and the study programme please contact the office of TULO.

Office of TULO
 faculty TBM
 Jaffalaan 5, 2628 BX Delft.
 Phone: 015 27 82786 / 015 27 83768
 E-mail: j.geerlings@tbm.tudelft.nl

1.6 Study and internship abroad

Study abroad offers a lot of attractive prospects. You become acquainted with a different (organisational) culture, a different university life and a different educational system. Besides you enlarge your personal network, you learn to live within a foreign environment, and you improve your knowledge of languages. To put it briefly: a period of study abroad will make a valuable contribution to your personal education and you will draw much benefit from it at your search for a proper job.

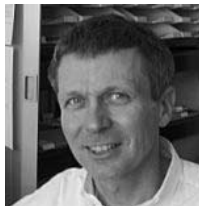
You can make use of one of many exchange agreements with European and non-European universities for your study at a foreign university. Within such an agreement you do not pay the foreign university any tuition fee. In addition to this, grants are available for financing the additional expenses for staying abroad. For your first information on studying abroad it is recommended to visit the *Back Office International Programmes* of the Student Facility Centre. Much documentation about study abroad is available at this Centre, like information on all universities with which an exchange agreement exists, possibilities of financing, and travel reports from students. Also information is available at the website: <http://www.sfc.tudelft.nl>.

If you got a clear idea about where you want to go to, you can ask the Coordinator for International Exchange Marine Technology for advise about your programme at the foreign university and about the recognition of your results at the host university. Your graduation professor will judge your work afterwards according to the rules you agreed upon, prior to departure.

The foreign programme should at least contribute 12 EC to your MSc programme. To arrange everything you have to do a lot yourself. Therefore you have to take a preparation period into account of preferably a year, but at least half a year.

Internship

Usually a internship is arranged via one of the staff members of the section to which your specialization belongs. In addition to this you can visit the Information Centre of the Student Facility Centre (see above). They offer a lot of information, not only on a large number of companies abroad, but also on financially related affairs, working permits, visa, etc. Additional information is available at the website: <http://www.sfc.tudelft.nl>.



Coordinator for International Exchange Marine Technology
dr.ir. D. Nijveldt
Room 8B – 2 - 27
Mekelweg 2
2628 CD Delft
Phone: 015 27 85921
Fax: 015 27 88340
E-mail: d.nijveldt@wbmt.tudelft.nl

1.7 Enrolling for courses and tests

There are different procedures to enroll. Usually it is necessary to enroll for courses and tests.

- Courses** Students can enroll for specific courses at Blackboard. Most of the communication between lecturer and students goes by blackboard announcements. Also exchange of information, assignments and reports often takes place via at Blackboard.
- Tests** Enrolling for tests is compulsory and can be done at the TAS-site ('Tentamen Aanmeld Systeem' <http://www.tas.tudelft.nl>). This should be done two weeks before the test takes place, at the latest, otherwise the test will not be accounted for by the lecturer. If a student has enrolled, but decided not to do the test, the student must cancel this, at least one week before the test takes place.
- Using TAS** When first using TAS the student must choose a personal password. This can be done by using the campus card in a card reader. At the faculty there are two card readers: one is located near the Pallas / Parthemus computerroom (4, 1st) and one is located at Education support staff (8B, 2th).

1.8 Pass rules and criteria for 'honours-degree'

- Pass rules** To pass a course or assignment, a grade of at least 6,0 is necessary. It is possible to pass the MSc- examination with one grade of 5. The grades are rounded off to the nearest integer.
- Examination** On completing the programme, the student should apply for the Master's examination by means of a form, available from the Education Support Staff.
- 'honours- degree'** The 'honours-degree' is granted to graduates with the following study results:
- grade average, excluding the MSc-thesis, is at least 7,5
 - no grades lower than 6
 - grade for MSc-thesis is at least 8
 - not more than 2,5 years to complete the MSc-programme
- This is a summary from part of the "Regulations and guidelines for the board of examiners", appendix 6.1 of this studyguide.

1.9 Honours Track

During the course year 2003-2004 it is possible to follow an honours track for excellent students. An honours track is a special individual programme, in addition to the regular Master programme, of 30 EC (840 hours) and is related to Marine Technology and / or to the role of technology within society. The extra programme has to be finished during

the Master programme of the student. Students who have successfully completed their honours track receive a special certificate of the university. Students, who have finished the Bachelor programme with a weighted averaged mark of 7.5 or higher and students who have shown an excellent performance during the first semester (no fails and weighted averaged mark 7.5 or higher), are eligible for following the honours track in their Master programme. The Director of Education is responsible for the programme of each individual honours track.

1.10 Profile of the Marine Technology Engineer

MSc graduates find their jobs in nearly all branches of industry, in management, design office, research, development or technical department. An increasing number of engineers plays a role in giving advice on and selling high-grade products and capital-intensive equipment. In our technologically highly developed society government bodies constantly need people with a technical-scientific education, i.a. for policymaking. In scientific education too mechanical engineers have their jobs.

The combination of broad technical-scientific BSc-programme and large choice of specialisations within the MSc-programme, give the Marine Technology engineer from Delft a versatile employability. This versatility is illustrated by the variety of professions, among which there are: designer, scientific researcher, organization expert and automation consultant. Many engineers occupy management positions within a short period: between 25 and 30 % lead a team of 5 to 6 persons in average within about one year.



© Damen Shipyards 2003, Flying Focus Aerial Photography

1.11 Cheating, Citation and plagiarism

When doing an assignment, project or other educational activity, the student uses sources and knowledge of other people. This is allowed if the following points are taken in mind:

Citation Citation, literally copying text is allowed, if:

- the text is limited in length and
- the citation is made between quotation marks and
- the source, even when this is an internet source, is mentioned in a correct and complete manner.

Paraphrasing Paraphrasing means describing a text of a third party in your own words. This is allowed, if:

- it is mentioned what is being copied and of whom and
- the source, even when this is an internet source, is mentioned in a correct and complete manner and
- there is a clear separation between the ideas of the third party and own ideas.

Plagiarism Plagiarism means copying of pieces of text, ideas, design and theories of others, without mentioning the source. Plagiarism is a form of cheating and is illegal.

Cheating Passengers Cheating is wider than plagiarism and also includes taking a look at other's work during exams or refusing to make an proportional amount of effort in a group assignment, which is assessed based on the effort of the group as a whole. People, who do this are called passengers.

Students suspected of copying, cheating, or being passengers, run the risk of being barred by the examination board from all tests and examinations held by TU Delft for up to one year. This can also have wide-ranging consequences for both the duration and the financial aspects of your course of study.

(With information from the TBM flyer 'Copying is a copout')

Organisation

2 Organisation

2.1 Faculty

The faculty Mechanical Engineering and Marine Technology offers the study programmes Mechanical Engineering (ME), Marine Technology (MT) and Systems and Control (SC).

The organisation of the faculty and the structure of the educational and board of examiners of the faculty are described in the faculty regulations.

The dean has the final responsibility for the faculty. He is assisted by the education director. Together with the department heads they form the management team. The dean is supported by the Faculty Staff and is advised by a number of advisory boards.



Dean prof. ir. W. L. Dalmijn, room 8F – 1 –14, phone: 015 27 85401, e-mail: w.l.dalmijn@wbmt.tudelft.nl

2.2 Education support staff

The education support staff is executing the education support of the study Marine Technology. For all issues related to the Marine Technology study the students can get information. The Education Support Staff consists of the following persons:

| | | | |
|--------------------------|--|---------------------------------|-------------------|
| prof.ir. Hans Klein Woud | Director of Education | j.kleinwoud@wbmt.tudelft.nl | Tel. 015 27 81556 |
| ir. Nic-Jan van Bommel | Manager Educational Programmes | n.j.vanbommel@wbmt.tudelft.nl | Tel. 015 27 88791 |
| Fatma Çinar | Education Administration office | f.s.cinar@wbmt.tudelft.nl | Tel. 015 27 86753 |
| Teuni Eden | Student adviser | t.eden@wbmt.tudelft.nl | Tel.015 278 2176 |
| Lies Gesink | Education Administration office | e.g.gesink@wbmt.tudelft.nl | Tel. 015 27 86591 |
| Aad Gutteling | Study Administration office | a.gutteling@wbmt.tudelft.nl | Tel. 015 27 86753 |
| Louise Karreman | Study Administration office | l.m.karreman@wbmt.tudelft.nl | Tel. 015 27 83457 |
| Ewoud van Luik | Manager Education Administration office & webmaster | e.p.vanluik@wbmt.tudelft.nl | Tel. 015 27 85734 |
| dr. ir. Dick Nijveldt | Educational Adviser & Coordinator international exchange | d.nijveldt@wbmt.tudelft.nl | Tel. 015 27 85921 |
| Carel Piguillet | Software Support | c.f.f.piguillet@wbmt.tudelft.nl | Tel. 015 27 86820 |
| ir. Jaap v.d. Zanden | Student adviser | j.vanderzanden@wbmt.tudelft.nl | Tel. 015 27 82996 |

Education Support Staff
Mekelweg 2, 2628 CD Delft
Location 8B, 2th floor
Phone: 015 27 86959 / 015 27 83457
Fax: 015 27 88340

2.3 Education committee

The education committee advises the dean and the education director on the contents and the structure of the study programme and the examinations.

The education committee consists of four lecturers and four students. Also the education director, the education adviser and a student adviser take part in the meetings.

Chairman prof. dr. ir. J.A. Pinkster
room 7 – 1 - 127
Mekelweg 2
2628 CD Delft
015 27 83598
j.a.pinkster@wbmt.tudelft.nl

Secretary mw. F.S. Çinar
room 8D – 2 - 26
Mekelweg 2
2628 CD Delft
015 27 86753
f.s.cinar@wbmt.tudelft.nl

2.4 Board of examiners

The board of examiners consists of all lecturers, involved in the study programme, as mentioned in paragraph 1.5.

The board of examiners is responsible for the rules and regulations of the examinations and the assessment of the examination results. Requests can be addressed to the board of examiners for participating in a deviating study programme.

Chairman prof. ir. J. Klein Woud
room 7-1-121
Mekelweg 2
2628 CD Delft
015 27 81556
j.kleinwoud@wbmt.tudelft.nl

Secretary E.P. van Luik
room 8B-2-33
Mekelweg 2
2628 CD Delft
015 27 85734
e.p.vanluik@wbmt.tudelft.nl

2.5 Students association

'Scheepsbouwkundig Gezelschap "William Froude" is the students association for all students Marine Technology, an association for and by students. Froude acts in the benefits of the students and organizes a variety of social and technical activities.



Activities Froude organizes excursions to enterprises in Holland and abroad, case tours, workshops and overnight-tours. Further Froude organizes symposia and lectures.

To support contact with fellow students sports days, drinks and parties are being organized. Froude coordinates the contact between students and the faculty. Students have a say in the organization of the education and changes in the study programme. Froude has organized a variety of excursions abroad over the years. Every year the MBE ("multiple day excursion") is organized. The MBE is a five-day journey orientated on Marine Technology to, for example, Sweden, Scotland, Italy or Denmark. Once every two years a two or three weeks journey is organized. These journeys have destinations like the USA, Russia, Japan, Korea and China. By working on a maritime project in an enterprise, students can earn a part of the travelling expenses.

Centenary

17 november 2003 it will be 100 years ago that Froude was founded. Of course, this can't go over without recognising it. The lustrum-committee and the sub-committees are very busy to organise two unforgettable weeks. During this period, a interesting symposium will be held, a book about 100 years Froude will come out and parties and surprising activities will take place. This two weeks will be round off with a chic ball.

Pass by

Froude has an office in the corridor behind the design studios (8B, 1st). In our room the coffee is ready and the soda is cold. Everybody is welcome to ask questions about lectures, to complain about assignments or just to tell his/her story. It is very important for us to know what is going on in the study, so, when necessary, we can act on it.

S.G. "William Froude"
Mekelweg 2
2628 CD Delft
Phone: 015 27 86562
Fax: 015 27 85602
E-mail: froude@wbmt.tudelft.nl
<http://www.froude.tudelft.nl>



2.6 Student guidance

For assistance and advice to students the faculty has two student advisers. The student adviser is the person for questions or problems related to the study or about issues, which may influence the ability to study. The student adviser functions as oracle (vraagbaak) and as confidential consultant to students.

The student adviser has no educational responsibilities and can, therefore, devote himself totally to individual students and to help solving their problems which may be an obstacle to their study progress. He also takes seat in a lot of boards and has contact with the lecturers, so that he has up to date information about what is going on in the study Marine Technology. He also has contact with other student advisers and personal advisers at the TU Delft and outside the University; so he knows what is going on elsewhere.

During a talk with a student adviser, often intimate information comes up. The student can be sure that this information will be dealt with confidentially. This kind of information will only be used after consultation with the student, to plead to apply TU- or faculty regulations. A student adviser can decide, as result of certain conditions, to advise e.g. the board of examiners, in favour of a specific student. When necessary the student adviser becomes an intermediary between TU Delft personal advisers: student, deans, psychologists and physicians.

The amount, in which the student adviser pays attention to a student, is up to the student. The student adviser keeps an eye on the study progress of most of the students and calls up one when necessary, but it is strongly recommended to contact the student adviser yourself when a question or problem comes up. Waiting often results in an increase of the problem.

The two student advisers at the faculty are available for all questions. They also have their own specialisms.



mrs. Teuni Eden, for all students BSc-MSc WbMT.

Specialisms: exchange students, social programme exchange students

Mekelweg 2, 8B 2th floor, room 28B

Email: t.eden@wbmt.tudelft.nl

Phone: 015 27 82176

Consulting hours on Mondays en Wednesdays from 12.30 till 13.30 hrs.



ir. Jaap v.d. Zanden

Specialisms: MSc students, polytechnic high school students, quality control, student mentors

Mekelweg 2, 8B 2th floor, room 28A

Email: j.vanderzanden@wbmt.tudelft.nl

Phone: 015 27 82996

Consulting hours on Tuesdays en Thursdays from 12.30 till 13.30 hrs.

Dyslexia

Students having dyslexia usually have problems with reading and understanding of long texts. This can be an obstacle to 'normal' study progress. Therefore these students are advised to contact one of the student advisers and to set up a remedial plan. Important issues are:

- A planned study delay often helps
- When necessary, longer time for tests is possible
- Studying with a fellow student often results in more study progress
- IBG has extra student grants

Working conditions and RSI

RSI (Repetitive Strain Injury) is a well known problem by now. Within the TU Delft the number of complaints caused by RSI is increasing. Still too many employees and students neglect the first symptoms of RSI, without knowing where to go with their questions and complaints. On the internet there is a lot of information to be found on this matter. An example is <http://www.rsi.pagina.nl>.

Free software, can be downloaded on the WbMT website, that helps you to prevent RSI: <http://www.wbmt.tudelft.nl>, button: "facilities".

Causes There are two mechanisms that cause RSI:

- Dynamic loading: repetitive dynamic loading of muscles in fingers and hands, without taking breaks, can cause an overload in these muscles. Friction between muscles, tendons and bones can eventually cause damage.
- Static loading: constant stressing of muscles in the neck, shoulders and arms prevents blood circulation and squeezes off nerves. This results in cold and tingling fingers. Mental stress and unfavourable positioning of the body increases this effect.

Symptoms There are various symptoms, which indicate RSI: pain, stiffness, tingling and a loss of strength can occur in neck shoulders, arms, wrists, hands and sometimes even in legs. Without resting these symptoms will only get worse.

Prevention How to prevent RSI:

- Vary repetitive tasks, like typing and using a mouse, with non repetitive tasks, like walking to the printer or reading documents.
- Take regular breaks. It is recommended for every two hours work to take a 10-minute break and for every 10 minutes work to take a 20-second break, to improve blood circulation. It is even better to do exercises, within these breaks. For this purpose anti-RSI-software can help.
- It is strongly disrecommended to do more than six hours of computer work a day.

- Make sure that the working position of the body is correct. A good installed workplace is important for a correct working position. Sit straight in front of your monitor and keyboard. The height and distance of the monitor and desk should be sufficient. A chair with a convex back at waist height is favourable.
- Try not to work under stress caused by deadlines or private problems.

Don't neglect the symptoms of RSI. For questions you can contact the following people:

- Student adviser
- Student Health Care (SGZ), tel: 015 2121507, studentenartsen@sgz.nl
- Student Facility Centre (SFC), <http://www.sfc.tudelft.nl>
- VSSD support, tel: 015 27 82057, <http://www.vssd.nl>

2.7 Quality Control

The education quality is continuously monitored and evaluated. This is done by the faculty itself and by external organisations. The results of the evaluations are public. A summary of these results can be found on the internet.

Based on these results the education committee, together with the education director advises the dean.

Internal Quality Control:

- SENSOR** - To evaluate the opinion of the students the "**SENSOR-course-evaluation-system**" (CENS) exists. This system gives all students the opportunity to give their opinion on the education anonymously. The study programme and courses are evaluated for each period. The results of evaluations can be found on the website, as well as the pass rates.
- Poll** - At the end of each year there is a poll: 'eindejaarsenquête'.
- Complaints** - Regular **Evaluation meetings** with students and lecturers.
- Submitting and dealing with **complaints**. These complaints can be lodged at the students association or at the education director.
- The faculty evaluates itself regularly in a self-assessment.
- The student association establishes "Lecture Response Groups". These groups publish, together with lecturers, in the 'Meer dan Konsumentengids' their comments on the courses. They also give a direct feedback to lecturers.

External quality control:

- The study is being examined every five years, by a accreditation committee. This results in index numbers and efficiency performance indicators. For more information see www.vsnu.nl.
- ABET** - Every six years the educational programme is examined and evaluated by the ABET (Accreditation Board for Engineering and Technology, in Baltimore, USA). This takes place on voluntary base.

2.8 Information services

- Study guide** This study guide is the main information source of the study programme and is available to all students at the study administration.
The website, however always contains the most recent information. Announcements, which are of importance for the study, like changes in the schedules, are made timely on
- Blackboard** the homepage of the faculty and at Black Board.
Schedules about the lectures, assignments and examinations are available at the desk of the study administration. At the homepage of the faculty and Black Board the changes in these schedules are given.
Information that is not related directly to the study e.g. information by students association 'Gezelschap Leeghwater', will be published on publication boards. Members of 'Gezelschap Leeghwater' will be kept informed by e-mail.

2.9 Rules and Regulations

Faculty regulations

- Students have to follow the instructions given by staff members. Staff members are those who support or give lectures and those who are responsible for buildings and the surrounding areas.
- On the first demand of a staff member the student should identify him- or herself by showing the campus card.
- The student should be present in time, before the start of a lecture, assignment, instruction or meeting. The lecturer or assistant may reject students who are late.
- Regular times for lectures to start are:

| Lecture | Start | End |
|-----------------------|-------|-------|
| 1 st hour: | 8.45 | 9.30 |
| 2 nd hour: | 9.45 | 10.30 |
| 3 rd hour: | 10.45 | 11.30 |
| 4 th hour: | 11.45 | 12.30 |
| 5 th hour | 13.45 | 14.30 |
| 6 th hour | 14.45 | 15.30 |
| 7 th hour | 15.45 | 16.30 |
| 8 th hour | 16.45 | 17.30 |

- Bikes should be placed in the bike stands provided
- There is an opportunity to store personal belongings in lockers which are provided in the main hall. In the corridor situated next to lecture rooms A till F, bigger lockers can be used to store helmets. At the end of the study year, before the 15th of July, the lockers should be empty and the keys should be returned. Lockers, still in use after the 15th of July, will get a new lock on cost of the student.

- Eating and drinking is only allowed in the canteen, the coffee corner and in the immediate surroundings of a soda, candy, coffee or soup dispensers.
- Writing on, drawing on, sticking things on or scratching in furniture, walls, doors or windows is prohibited.
- Garbage and paper should be disposed in bins.
- For the use of computers, network connections, printers and plotters there are rules and regulations, which should be taken in consideration.
- Disobeying of rules and regulations can result in a suspension or a denial of certain facilities. Theft or destruction on purpose of properties of TU Delft and also serious misdemeanours (misdragingen) will be mentioned to the proper authorities.

Student Statute (Studentenstatuut)

The Education Specific Part of the Student Statute (OSDS) applies to the education and the exams of the study Marine Technology.

The OSDS defines which educational services are given by the faculty and what is demanded from the students. The OSDS intends to offer the students an easy way to accomplish improvements in the educational situation, with help of the education director.

The OSDS consists of:

- This Study Guide
- The Course and Examination Regulations for the study Marine Technology (CER, see appendix 6.1)
- Implementation Procedures (appendix 6.2)
- Regulations and guidelines for the board of examiners (appendix 6.3)

Internet facilities

Using the internet facilities at the faculty is bound to some regulations:

It is allowed to:

- Send e-mail to persons (or applications) from which can be expected that they will not consider the e-mail as annoying. Also you can receive e-mails which can be temporary stored in the inbox.
- Read online magazines and to place articles in it.
- Use the network information services like WWW-servers and FTP-servers, which are in use at this moment and also which will become available in the future. All use of services is bounded by regulations.
- Use the "Intranet DUNeT" on telephones provided through the faculty.

It is not allowed to:

- Damage or disable facilities
- Use available facilities in any other way as they were supposed to be used:
 - downloading, uploading and filesharing of copyright protected items, such as texts, audio and video files, in any format
 - downloading and installing any applications on the faculty computers
 - playing computer games using network facilities
- Make excessive use of the facilities
- Let a third party use available facilities (including fellow students)
- Do damage or obstruct other users or equipment linked to the world wide web
- Disrespect other peoples privacy, for example by sending information under a false name
- Become member of a mailing list outside the faculty without permission of the "dutwmail director". This rule only applies to the students.
- Distribute or show material that can be regarded as offending, for example insulting phrases or pornographic images or movies.

Sanctions:

- account deactivation immediately after a violation has occurred
- in case of serious violation and in case of repeated violation: prohibition of the use of ICT facilities, up to a year
- in case of law violation: notification to the police
- all claims, as a result of violations, are passed to the violator

Facilities

3 Facilities

The locations of facilities, as mentioned in this chapter, can be found at the faculty map in appendix 6.7. In this study guide is being referred to this map, with a number and a letter, which corresponds to a certain part of the building. The floor is also indicated (BG= ground floor, 1st = first floor, etc.).

3.1 Lecture Rooms / Meeting Rooms

Lecture rooms are used for lectures, (graduation) presentations and instructions. The next table shows all the lecture rooms, their capacity and their location.

| Room | Capacity | Location |
|----------------|----------|-------------------------------|
| A | 300 | 6, BG |
| B | 200 | 6, BG |
| C | 150 | 6, BG |
| D | 150 | 6, BG |
| E | 70 | 6, BG |
| F | 70 | 6, BG |
| J | 50 | 8D, 1 st |
| K | 30 | 8G, 1 st |
| L | 30 | 8G, 1 st |
| M | 20 | 8A, 2 nd , room 17 |
| R | 70 | 6, BG |
| Meeting room 4 | | 8B, 2 nd |
| Meeting room 5 | | 8B, 2 nd |

Meeting rooms are available for meetings, discussions etc. of small groups of students. Reservations can be made as the desk of the education administration.



3.2 Student work facilities

Study places

At several locations in the faculty individual study places are available. Some of these study places are equipped with computers. Every student can use such a place. It is not possible to make a reservation. No student has to vacate a study place for a fellow student. Places should be left clean and tidy.

Study places in the library

Besides the study places as mentioned above, there are also places to study in the library. Individual students can use these places. In the library students have to be silent. The same rules apply as for the study places.



3.3 Computer rooms

Besides computers at the different study places, there are computers available in the computer rooms. Each computer room is provided with a network printer. All computers give access to the internet. The computer rooms are sometimes in use for instructions or assignments. When they are, the computer rooms are not accessible for everybody. A schedule, on the door of each computer room tells when these instructions or assignments take place. If computer rooms are not in use for instructions or assignments, individual students can use them.

The next table shows all the computer rooms and their location.

| Room | Location |
|----------------|--------------------|
| Athena room | 4, 1 st |
| Parthemus room | 4, 1 st |
| Pallas room | 4, 1 st |
| Design studios | 8G, BG |

3.4 Research facilities

The faculty has a number of research laboratories. Students may perform a part of their study e.g. the MSc-Thesis or an laboratory exercise in these laboratories. The laboratories are used for research activities of Ph.D.- Students and staff.

The different laboratories are:

Hydromechanics Laboratory

Facilities 140 m Towing tank
85 m Towing tank
Cavitation tunnel

Location: 7



Ship Structures Laboratory

Facilities Servo-hydraulics testing machines of different capacities
Data acquisition equipment
1000-tons test machine for large-scale fatigue tests

Location: 7

3.5 Library

Central library

Prometheusplein 1
Postbus 98
2600 MG Delft
tel: 015 27 85678
fax: 015 27 85706
www.library.tudelft.nl

The library of the TU Delft consists of a main building and smaller libraries in each faculty. The main building has a large collection of books, reference books and magazines. The main part of the collection can be lent from the library, a smaller part is only available within the library. The main part of the collection has to be requested and will be available at the desk within half an hour after requesting. The other part, like study books and lecture notes, is available in the bookcases in the back of the building. The main building has more than 1000 study places (at the ground floor, on the different floors of 'the cone' and in a couple of group rooms), a computer room and coffee and candy dispensers. To lend a book, a student should possess a library card. This pass can be acquired at the desk in the main building or at the library of the student's faculty.

Opening hours Monday to Thursday 9:00 - 24:00
Friday 9:00 - 18:00
Saturday and Sunday 10:00 - 18:00

Book desk Monday to Thursday 9:00 - 19:00
Friday 9:00 - 17:00
Saturday 10:00 - 13:00



Books can be borrowed for a period of 28 days. This term can be extended as long as no other person makes a reservation for the book.

The central library is behind the auditorium (aula) at the Prometheusplein, see appendix 6.5.

Faculty Library

The faculty library is a part of the TU Delft library. It has a collection, specifically for Mechanical Engineering and Marine Technology. This doesn't mean that all books on these subjects can be found here. A part of the books on Mechanical Engineering and Marine Technology can be found in the central library. In the faculty library the lecture-notes and books, used in the study, are available. These books and lecture-notes are not lent out in general. The faculty library also offers places to study. Print and scan equipment is available and there are several recent technical magazines. The library is located at the ground floor in section 8D.

Opening hours Monday to Friday 9:00 - 17:00

Request Searching and requesting books is possible by the online catalogue at <http://www.library.tudelft.nl>. This catalogue includes all collections of all libraries of the TU Delft. Besides the catalogue, requesting of books is possible at the desk of the central library and the faculty library.

Library card In order to use the library facilities a student is supposed to have a library card. This card can be requested at the desk of the central library or faculty library. To make the request the student must bring an Personal Identification (passport, driver's licence, etc.) and an Address Identification (recent bank statement, insurance policy, etc.). The library card is free from charge and for personal use only.

3.6 Lecture notes

Most lecture notes, which are used for lectures at the faculty, are available at the selling point for lecture notes, at the repro. Also books and office articles are available.

Opening hours: Monday to Friday 9:00 - 16:00

<http://www.io.tudelft.nl/repro/>, 015 2783062

Location: 10, BG.

3.7 Mailbox and access to the internet

E-mail account Each student has the possibility to communicate on the Internet. Therefore each student gets an e-mail account. This e-mail account is connected to the faculty server. It is also possible to use this account at home. Students also get an account on the NT-computers in the faculty. At these computers the student is able to access the Internet, print and use other network facilities.

Printing Printing is paid for by a print account. Each student gets a welcome account of €11.50 to start with. At the reception desk the account can be upgraded, from 8:30 till 16:30. It is possible to check the print account at all time, by pointing with the mouse on the 'dollar sign'-symbol in the taskbar at any computer at the faculty.

The services mentioned above are taken care of by:

I&A Service information and automation (Dienst Informatisering en Automatisering) (I&A):
Managing of computers, servers and the network
Phone: 015 27 82001
E-mail: helpdesk@wbmt.tudelft.nl

System administrator and postmaster J.M.Kalkman, phone: 015 27 86858, e-mail: j.m.kalkman@ocp.tudelft.nl, room 8A-1-06

DTO Service Technical Support (Dienst Technische Ondersteuning) (DTO):
Supporting when problems with accounts occur
Phone: 015 27 82000
E-mail: info@dto.tudelft.nl



3.8 Available software

The student is able to use a large variety of software provided on the computers at the faculty. The table below shows all available software in the computer rooms and the project tables.

| | |
|-----------------------|----------------------------|
| Acrobat Reader 5.1 | Microsoft Frontpage 2000 |
| Adams 12 | Microsoft Office 2000 |
| Ansys 5.7.1 | Microsoft Visual Basic 6.0 |
| Autocad 14 | News Xpress |
| Autocad Lite 2002 | Paint Shop Pro 7 |
| Borland Pascal 7.0 | Powerarchiver 6.1 |
| Card | Pro Engineer 2001 |
| CMS | Qres |
| Corel Draw | Real One Player |
| Flash | Shockwave |
| GSP 9.111 | SMS |
| Holtrop | Sophos Antivirus |
| Internet Explorer 6.0 | TAS |
| Maple 8 | TNT Lite 6.6 |
| Mathcad 5.0 | WBalance |
| Mathtype 4 | Workpace |
| Matlab 6.1 | WS-FTP LE 5.08 |

3.9 Catering

The faculty offers a variety of catering facilities.

- Canteen** The faculty canteen serves a comprehensive lunch. The canteen can be found at location 10, BG.
- Coffee corner** The coffee corner is specialised in a quick snack. The coffee corner is situated in the main hall (8F). Chairs and couches are available. Opposite of the coffee corner there are dispensers for serve coffee, candy bars, sodas and soup. Paying at these dispensers is only possible by using a chipknip.
- Faculty room** The faculty room is a place for giving symposia, meetings or graduation drinks ("afstudeerborrels"). A reservation can be made at the reception desk (6).
- Lagerhuysch** The Lagerhuysch is situated in the cellar beneath section 8B. There is an access on the square in front of the faculty. The Lagerhuysch offers the possibility for giving graduation drinks (afstudeerborrels), but also for organising symposia and meetings. The students associations Gezelschap Leeghwater and William Froude regularly organise a reception. On the site <http://www.lagerhuysch.tudelft.nl> a route description and a reservation form for the Lagerhuysch can be found.
- Auditorium** Within the TU Delft auditorium a variety of catering facilities is available. Lunch time is from 11.30 till 13.30, diner time from 16.30 till 19.30. See [appendix 6.5](#) for the location of the auditorium.

Service for Students

4 TU - Services for students

The TU Delft provides several service centres for students:

- Student Facility Centre
- Sports Centre
- Cultural Centre TU Delft 'Mekelweg 10'
- Library TU Delft

For all other services: refer to the TU Delft website, <http://www.tudelft.nl>.

SFC The Student Facilities Centre (SFC) consists of several departments, which provide a diversity of services to students, staff members and faculties.

Some examples of these services are provision of information concerning:

- Studying abroad
- All possible forms of education at the TU Delft
- Study support and advise
- Housing
- Financial support and sponsoring for students and student associations

Student Facilities Centre Front Office

Julianalaan 134

2628 BL Delft

Postbus 5

2600 AA Delft

Phone: 015 27 88012

<http://www.sfc.tudelft.nl>

Sports Centre The Sports Centre provides all kinds of sports facilities:

- Indoors, this means accommodation in several halls and gyms, in which almost any kind of sport can be done.
- Courses and trainings organized by professional instructors.
- Outdoors there are 12 tennis courts and (natural) grass fields for playing soccer, hockey, cricket, rugby, baseball and softball. Most of these fields are illuminated during evenings.

Also it is possible to use the facilities on an individual basis.

Sports Centre

Mekelweg 8

2628 CD Delft

Phone: 015 27 82443

Fax: 015 27 87087

<http://www.sc.tudelft.nl>

Cultural Centre 'Mekelweg 10'

Anyone who likes to express oneself in an artistic manner can do this at the Cultural Centre. The activities and courses are aimed at cultural education and at stimulating forms of expression such as: audio-visual, visual, communicative, musical and dancing. 'Mekelweg 10' also supports cultural activities of student organisations and members of staff of TU Delft.

The facilities are:

- Design studios
- Several studios for midi and DeeJay's
- Darkroom for photography
- Video editing room
- Rehearsal room for musicians

Cultural Centre TU Delft 'Mekelweg 10'
 Mekelweg 10
 2628 CM Delft
 Phone: 015 27 83988
 Fax: 015 27 83946
<http://www.cc.tudelft.nl>



ICT Infrastructure

Infrastructure services, concerning telephony and ICT facilities are provided by DTO (Technical Support Service). Services concerning students, as described at <http://www.dto.tudelft.nl> are:

Internet facilities for student accommodation

A number of internet access facilities for student accommodation are offered by the TU Delft.

OLI

OLI is a foundation that supports students, by offering internet facilities, e.g. to exploit websites. This is possible for all kind of student organisations, like student associations, study associations, student's houses, etc.
<http://www.oli.tudelft.nl>

Course descriptions

N.B.:

All courses are given in English, otherwise a notification is given in the course descriptions:

- NL: means that the course is only given in Dutch
- NLR: means that the course is given in Dutch, on request the course is given in English
- ??: Unknown at the time of writing

| | | | |
|------------------------|--|-----------|------------|
| mt112 | Ship Design 3 | | |
| Lecturer | Lagers, ir. G.H.G. | | |
| Course Material | Hand outs at the lectures | | |
| Description | Reliability, innovation, economy in the ship design Recent developments in the design of maritime objects are reviewed under the general theme of reliability, innovation and economy. The majority of the subjects in these lectures are treated in a seminar form: each of the students presents a part of the subject. One or two guest lecturers from the industry are invited. | | |
| Education | Lecture 2/0/0/0 | EC | 3 |
| Assessment | Oral | | NLR |
| mt113 | Ship Design 4 | | |
| Lecturer | Frouws, ir. J.W., Stapersma, prof.ir. D., Keuning, dr.ir. J.A. | | |
| Course Material | J. Pinkster, "Introduction to Advanced Marine Vehicles", 1994, and copies of publications on relevant topics. | | |
| Description | Introduction to advanced marine vehicles, propulsion systems, ship motions, materials, strength of materials, safety aspects, shipowner's requirements and economics, design of advanced marine vehicles | | |
| Education | Lecture 0/4/0/0 | EC | 3 |
| Assessment | Written | | NLR |
| mt212 | Marine Engineering B | | |
| Lecturer | Klein Woud, prof.ir. J. | | |
| Course Material | J.Klein Woud, "Marine Engineering B", 2003. | | |
| Description | flexiblemounting of equipment, dynamics of shaft systems, torsional, axial and lateral vibrations (whirling), shaft alignment | | |
| Education | Lecture 2/0/0/0 | EC | 3 |
| Assessment | Oral | | NL |

| | | | |
|------------------------|---|-------------|------------|
| mt213 | Marine Engineering C | | |
| Lecturer | Grimmelius, ir.ing. H.T. | | |
| Course Material | Klein Woud, K.: "Maritieme Werktuigkunde IV", TU-Delft, 1999. Selected papers. | | |
| Description | Maintenance concepts. Relation with Life Cycle Costs. Reliability. Availability. Event & Fault tree analysis. Condition Monitoring. | | |
| Education | Lecture 0/2/0/0 | EC 2 | |
| Assessment | Written | | NLR |
| mt216 | Internal Combustion Engines | | |
| Lecturer | Klein Woud, prof.ir. J. | | |
| Course Material | Marine Engineering. Design of Propulsion and Electric Power Generation Systems. J. Klein Woud and D. Stapersma. , and some prints will be provided | | |
| Description | Basic thermodynamic principles. Piston engines both diesel and otto engines. Gas turbines Fuel characteristics | | |
| Education | Lecture 0/0/0/2 | EC 3 | |
| Assessment | Written | | NLR |
| mt217 | Design Methodology and Knowledge Engineering | | |
| Lecturer | Klein Woud, prof.ir. J., and others | | |
| Course Material | overhead sheets on Blackboard | | |
| Description | Design methods; design phases; functional design; knowledge; knowledge representation; knowledge acquisition; procedural versus knowledge based software; Example of a knowledge based design tool: QUAESTOR; examples of use of QUAESTOR; simulation based design. | | |
| Education | Lecture 2/0/0/0 | EC 4 | |
| Assessment | Written report | | ?? |

| | | | |
|------------------------|---|-----------|-----|
| mt218 | Mechatronics in MT | | |
| Lecturer | Grimmelius, ir.ing. H.T. | | |
| Course Material | 'Dynamic positioning of vessels at sea'; Pinkster 'A Study on Weather Vaning Dynamic Positioning System`; Pinkster, Hagiwara, Shoji, Fukuda + additional material | | |
| Description | Mechatronics, sensors and actuators, signal sampling, filtering, D/A-A/D conversion, hardware-in-the-loop control and simulation, weather vaning DP/DT system | | |
| Education | Lecture 0/0/4/0 | EC | 5 |
| Assessment | Written report | | ?? |
| mt313 | Shipping Management | | |
| Lecturer | Meersman, prof.dr. H., Voorde, prof.dr. E. van de (Universiteit Antwerpen, ITMMA) | | |
| Course Material | | | |
| Description | De werkwijze hiervan is als volgt: de student kiest in overleg met de professoren een onderwerp dat hij/zij wil uitdiepen; de student(e) wordt op weg gezet, d.i. hij/zij krijgt bibliografische referenties en suggesties i.v.m. lopend (internationaal) onderzoek; er worden een aantal 'hearings' georganiseerd waarop de eventuele problemen worden besproken; de student(e) verdedigt voor de groep een zelf uitgewerkte paper over het gekozen onderwerp. | | |
| Education | Lecture 0/0/4/0 | EC | 3 |
| Assessment | Written report + presentation | | NLR |
| mt411 | Offshore Technology | | |
| Lecturer | Boonstra, ir. H. | | |
| Course Material | B. Boon and H. Boonstra, "Design of Maritime Offshore Constructions II" (in Dutch), 1991 | | |
| Description | Application of marine technology in the design of floating offshore platforms, including wave loading, hydrostatic stability, motions in waves, structural strength, logistics, deck lay-out, safety. Analysis of catenary mooring systems and of riser systems. Criteria and requirements posed by offshore industrial activities, platform owners, construction yards, authorities. | | |
| Education | Lecture 4/0/0/0 | EC | 3 |
| Assessment | Written | | NLR |

| | | | |
|------------------------|---|--------------------|-------------|
| mt514 | Ship Movements and Steering 3 | | |
| Lecturer | Pinkster, prof.dr.ir. J.A. | | |
| Course Material | Scheepsbewegingen, sturen en manoeuvreren 2: Prof. J. Gerritsma Wave drift forces: Prof.dr.ir. J.A. Pinkster | | |
| Description | Manoeuvreren en Sturen. Verdieping theorie manoeuvreren van schepen en andere objecten. Lineaire modellen, niet-lineaire modellen. Model proeven ter bepaling van coëfficiënten voor lineaire en niet-lineaire mathematische modellen. Stoppen en versnellen van schepen. Invloed van beperkte waterdiepte en beperkte breedte van een vaarwater. Onderlinge beïnvloeding van schepen. Simulatoren. Scheepsbewegingen. Verdieping theorie van scheepsbewegingen. 3-dimensionale diffractie theorie. Strip theorie. Gedrag van afgemeerde offshore constructies. Niet-lineaire golfdrijfkrachten. | | |
| Education | Lecture 0/0/0/4 | EC | 3 |
| Assessment | Written | | NL |
| mt515 | Propulsion and Resistance 3 | | |
| Lecturer | Terwisga, prof.dr.ir. T. van | | |
| Course Material | Course notes, distributed during classes | | |
| Description | Assessment of importance of dynamics in flow, understanding of possibilities and limitations of use potential flow BEM methods and RANS, basic understanding of physics of cavitation and consequences for propulsors | | |
| Education | Lecture 2/2/0/0 | EC | 3 |
| Assessment | Presentation | | NLR |
| mt523 | Numerical Methods for MT | | |
| Lecturer | Koning Gans, dr.ir. H.J. de, Bosman, ir. T.N. | | |
| Course Material | Koning Gans, Dr. Ir. H.J. de "Numerical Methods in Ship Hydromechanics" | | |
| Description | Explanation of several flow models and their fluid mechanics properties (pressure, velocity, mass and volume flow, momentum, energy flow etc.) and fluid domain in contrast with aerodynamics. Modeling flow models into numerical flow models. Elementary solutions for potential flow and how to use them for panel codes which used these elementary solutions. Greens' function theory. Grid generation techniques and how to use them. Several numerical error in the developing stage, desing and applications stage. Application for numerical method: Viscous flow Diffraction, Wave making pattern | | |
| Education | Lecture 0/0/0/4 | Computer exercises | EC 4 |
| Assessment | Presentation | | NLR |

| | | | |
|------------------------|---|------------|--------------------|
| mt524 | Hydromechanics of Special Ships | | |
| Lecturer | Keuning, dr.ir. J.A. | | |
| Course Material | WEGEMT Courses on Advanced marine Vehicles, Sailing Yacht Design and Course notes, distributed during classes | | |
| Description | Hydromechanics of Special Shiptypes, such as fast ships, advanced marine vehicles, (sailing) yachts. Topics calm water resistance, side force production and induced resistance, aerodynamics of sails, Velocity Prediction, (nonlinear) motions in waves, operability of fast ships, maneuvering, motion control and large motions | | |
| Education | Lecture 0/0/2/0 | EC | 3 |
| Assessment | Presentation | | NLR |
| mt724 | Ship Finance | | |
| Lecturer | Nienhuis, prof.dr.ir. U. | | |
| Course Material | Sources as accountants and banks: KPMG, Moret, Ernst & Young, NIB, etc. Shipping desks. Research institutes. | | |
| Description | Costprice, exploitation, budgetting, marketing, costs and tariffs, rentability, finance, courses of exchange, internal and external companyfactors for shipowners and yards. | | |
| Education | Lecture 0/0/4/0 | EC | 3 |
| Assessment | Essay, presentation, abstracts of presentations, written exam | | NL |
| mt725 | Inland Navigation | | |
| Lecturer | Dirkse, ir. C. | | |
| Course Material | S.Hengst, "Binnenvaart in beeld" (in Dutch) Delft University Press | | |
| Description | The position of inland shipping in Europe, ship types and their background Choice of ship type and equipment Logistic chains, cargo varyity, optimisation. Regulations and legislation on European waterways Relation ship - waterway New shiptypes. Design and construction; new developments in inland shipping | | |
| Education | Lecture 0/2/0/0 | Case study | EC 2 |
| Assessment | Written report + presentation | | NL |

| | | | |
|---|---|-------------|------------|
| mt726 | Projectmanagement in shipbuilding and offshore | | |
| Lecturer Course Material | Nienhuis, prof.dr.ir. U. See website | | |
| Description | Marketfactors, strategic planning, budgetting, operational research, production optimation, problem analysis, quality management, organisation and execution of repairs and salvage, scrapping, expertise, insurance, single production, production control, planning systems. | | |
| Education Assessment | Lecture 0/0/4/0 Essay + presentation | EC 4 | NLR |
| mt727 | Shipyard process simulation and strategy | | |
| Lecturer Course Material | Nienhuis, prof.dr.ir. U. See website | | |
| Description | Strategy, costing, investment decisions, operational research, logistics, characteristics of one-of production, internal and external process parameters, market parameters, quality control, business process simulation, business process optimization, international factor differences (labour, capital, material, productivity, etc), productivity indices. | | |
| Education Assessment | Lecture 0/0/2-4/0 Report, presentation, participation | EC 4 | NLR |
| mt728 | Ship repair and salvage | | |
| Lecturer Course Material | Nienhuis, prof.dr.ir. U., Dirkse, ir. C. To be supplied by the company involved | | |
| Description | Ship repair is an uncertain business with strong fluctuations in contracted work. Competition put pressure on the rates and environmental requirements raise the cost. Saving of manhours by introduction of innovative systems and careful jobpreparation and -control are topic is the business.A high level of craftsmanship and flexibility of the organisation are required. Salvage is even more uncertain and requires an organisation which can bring together the required material and expertise in a very short time. Sometimes unconventional technical solutions have to be applied. | | |
| Education Assessment | Lecture 0/0/2/0 Written report | EC 3 | NLR |

| | | | |
|------------------------|--|---------------------|-------------|
| mt814 | Vibration and noise in ships | | |
| Lecturer | Hylarides, prof.dr.ir. S. | | |
| Course Material | Lecture notes | | |
| Description | Further to the basic aspects of vibration and noise, as dealt with in mt832 and mt835, a more comprehensive presentation is given of the calculations related to noise and vibrations of ships. Subjects: vibration control, local vibrations, vibrations of sub-structures, propeller excitation of the hull, propeller noise, noise control, noise level prediction. | | |
| Education | Lecture 0/0/0/4 | EC | 3 |
| Assessment | Written | | NL |
| mt815 | Ship Construction and Strength: Special Subjects | | |
| Lecturer | Vink, ir. J.H., Hommel, ir. G. | | |
| Course Material | As made available by the relevant experts. | | |
| Description | Three advanced topics in the field of ship and offshore structures will be dealt with each year. - Each odd week, a topic is introduced by an expert during a lecture of 3 hrs. - Subsequently, the students have to work in groups on a task as defined by the expert. - The results of the task are presented and discussed in the next even week. | | |
| Education | Lecture 0/0/3/0 | Presence obligatory | EC 2 |
| Assessment | Participation + presentation | | NL |
| mt816 | Composite materials for ship construction | | |
| Lecturer | Leenders, ir. W.S. | | |
| Course Material | Summaries; course-book in preparation. | | |
| Description | Applications in marine structures, material components, physical and mechanical properties, production methods, structural concepts, sandwich, stiffening, joints and attachments, strength and stiffness, static and dynamic strength, response and capability, rules and regulations. | | |
| Education | Course week 0/0/0/x | EC | 2 |
| Assessment | Case | | NLR |

| | | | |
|------------------------|--|-----------|-----------|
| mt830 | Applications of the Finite Element Method | | |
| Lecturer | Hommel, ir. G. | | |
| Course Material | Finite Element Modeling for Stress Analysis, Cook,R.D., ISBN 0-471-10774-3 | | |
| Description | application and user aspects, modeling procedures, advanced elements, elastic kernel, errors and accuracy, recent developments, commercial software | | |
| Education | Lecture 0/0/0/4 | EC | 3 |
| Assessment | Written | | NL |
| mt835 | Hydro Structural Subjects | | |
| Lecturer | Vink, ir. J.H., Journee, ir. J.M.J. | | |
| Course Material | Hand outs will be available for each subject | | |
| Description | Superposition of global and local responses, Internal tank pressures, External pressures, Splash zone, Intermittent wetting, Long term distribution of stresses, Fatigue damage, Hydroelasticity | | |
| Education | Lecture 0/0/4/0 | EC | 3 |
| Assessment | Written report | | NL |
| mt836 | Advanced Programming | | |
| Lecturer | Hommel, ir. G. | | |
| Course Material | See website | | |
| Description | Analysis and formulation of simple and complex (maritime) problem. Design and implementation of a solution by means of FORTRAN90/95. Description of FORTRAN90/95, datatypes, variables and constants, control constructs, arrays, functions and subroutines, program units and procedures, intrinsic procedures, list directed and formatted input and output. | | |
| Education | Lecture 0/0/2/2 | EC | 3 |
| Assessment | | | NL |

Appendices

6.1 Course and Examination Regulations

Section 1 GENERAL

Article 1 SCOPE AND APPLICABILITY OF THESE REGULATIONS

1. These regulations are applicable to teaching and examinations of the Master's degree programme Marine Technology at Delft University of Technology, hereafter referred to as *the programme*.
2. These programmes are conducted under the responsibility of the Faculty of Mechanical Engineering and Marine Technology at Delft University of Technology, hereafter referred to as *the Faculty*.
3. For this programme, implementation procedures are in effect that supplement, and are integral to, these Course and Examination Regulations.
4. The Course and Examination Regulations and the implementation procedures are laid down by the Dean.

Article 2 DEFINITIONS

Any terms in these regulations also occurring in the Higher Education and Academic Research Act (WHW) will have the same meaning as that intended by that Act.

In these regulations, the following terms shall be understood as follows:

- | | | |
|----|----------------------|--|
| a. | the Act: | the Higher Education and Academic Research Act (abbreviated in Dutch to WHW), including its subsequent amendments; |
| b. | programme: | the Master's degree programme referred to in Article 7.3a, subsection 1 under b of the Act; |
| c. | student: | anyone enrolled at Delft University of Technology (as a student or "extraneous") for purposes of education and/or for taking the examinations and interim examinations that are part of the programme; |
| d. | practical training: | practical exercise as referred to in Article 7.13, subsection 2 under d of the Act, in one of the following forms: <ul style="list-style-type: none"> - writing a thesis; - writing a paper/completing an assignment, project or technological design; - completing a design or research assignment; - conducting literature study; - completing a work placement; - taking part in fieldwork or an excursion; - conducting tests and experiments; - or participating in another educational activity focused on the attainment of a particular skill. |
| e. | interim examination: | a test of a student's knowledge, insight and skills with regard to a particular unit of study, and the assessment of this examination by at least one examiner appointed for that task by the board of examiners. |
| h. | examination: | test used by the board of examiners to establish whether all interim |

- examinations that are part of the propedeuse (i.e. first year), kandidaats or doctoraal phases have been successfully completed as specified in Article 7.10 of the Act.
- i. board of examiners: the board of examiners as appointed according to Article 7.12 of the Act.
 - j. implementation procedures: the implementation procedures integral to the Course and Examination Regulations and applicable to a specific Master's programme.
 - k. working day: each day from Monday to Friday, with the exclusion of official national holidays.
 - l. course calendar: the publication containing all the specific information appropriate to a specific Master's course guide named in Article 1.
 - m. examiner: those appointed by the board of examiners for the purpose of taking interim examinations in accordance with Article 7.12 of the Act;
 - n. EC: European Credits as specified in the European Credit Transfer System
 - o. The University: Delft University of Technology

Article 3 OBJECTIVE OF THE MASTER'S PROGRAMME MARINE TECHNOLOGY

This Master's programme is intended to prepare graduates in Marine Technology for the practice of engineering at an academic level,

- capable to identify, define and analyse problems, for the solution of which Marine Technology principles and techniques can contribute
- capable to systematically design and produce a sound solution to the problem
- capable to present this solution in a convincing way.

Article 4 ADMISSION TO THE MASTER'S PROGRAMME

1. Admission to this programme will be granted to students in possession of a degree issued for the Bachelor's programme in Marine Technology issued by the TU Delft.
2. Students who are not graduates of one of the courses specified in paragraph 1 but who are in possession of a confirmation of admission provided by the Faculty will be eligible for admission.
3. To obtain confirmation of admission, a student must satisfy the criteria specified in paragraph 1.4 of the study guide.
4. If so requested by a student who is not in possession of a Bachelor's degree as specified in paragraph 1, the board of examiners may depart from paragraph 1 by allowing that student to attend parts of the Master's programme.

Article 5 EXIT QUALIFICATIONS OF THE MASTER'S PROGRAMME MARINE TECHNOLOGY

The Master's programme Marine Technology has the following exit qualifications:
Graduates will:

- have broad and deep knowledge of the basic engineering sciences
- have broad basic technical and scientific knowledge of the Marine Technology disciplines: Marine Systems Design, Hydromechanics, Structural Design, Production and Shipping Management
- be specialized in at least one Marine Technology discipline
- be able to innovate, to model and to design systems and equipment

- be able to contribute to solving multidisciplinary problems and to work both in multidisciplinary teams and independently in an international industrial context
- be able to communicate effectively with team members and environment
- be well aware of their responsibilities with regard to sustainability, economy, health, safety and social welfare
- be able to maintain professional competence through life-long learning

Article 6 FULL-TIME AND PART-TIME COURSE FORMAT

The Master's programme will be provided on a full-time basis.

Article 7 LANGUAGE

1. English shall be the language used for all teaching and examinations.
2. In certain cases, the Dean may depart from paragraph 1 by giving permission for teaching to take place in Dutch, if this is necessitated either by the specific nature of the organisation, the quality of the course, or the students' origins and backgrounds.
3. If a student asks to be allowed to take one component, or several components, of an examination in a language other than English, the terms of the regulations and the guidelines of the board of examiners will be applicable accordingly.

Section 2 COMPOSITION OF THE MASTER'S PROGRAMME AND THE FINAL EXAMINATION

Article 8

1. The composition of the educational programme is laid down in the implementation procedures. This educational programme starts once a year, in September.
2. Students can enter the programme at the beginning of each semester.
3. The examination for a Master's Degree is an integral part of the programme. The study load for this examination totals 120 EC.

Section 3 INTERIM EXAMINATIONS

Article 9 THE NUMBER, PERIOD AND FREQUENCY OF INTERIM EXAMINATIONS

- 1.a. The course shall provide at least two opportunities per year to sit interim examinations:
 - the first shall follow immediately after the teaching period in which the relevant component was taught and completed;
 - the second shall be given at the end of the second semester, or otherwise in the August resit period.
- 1.b. The interim examinations referred to under a. shall be held as indicated for the unit of study concerned in the timetable for the current academic year. At the beginning of each academic year, a timetable specifying the dates and times of written interim examinations shall be drawn up and published.

2. In the event that a course component is not taught within the Faculty itself, and therefore there is no indication of the number of times it is possible to sit an interim examination as referred to in paragraph 1, the course and examination regulations of the relevant Faculty or degree programme will be applicable, provided no decision to the contrary has been taken by the board of examiners.
3. Notwithstanding the provisions of the first clause under 1a, at least one opportunity shall be given per year to take an interim examination in a course component that has not been taught in that year.
4. In certain cases the board of examiners may allow departures from the specified number of times that an interim examination can be sat.

Article 10 THE ORDER OF INTERIM EXAMINATIONS

The implementation procedures shall specify the order in which the interim examinations will be taken, or in which students be to participate in practical training.

Article 11 THE PERIOD OF VALIDITY OF INTERIM EXAMINATIONS

1. Students who have interrupted their studies, or who have delayed their studies for other reasons, shall resit any component they passed ten years or more ago if its contents have since been modified.
2. The board of examiners may, in a student's favour, depart from the provisions of paragraph 1.

Article 12 THE FORM OF THE INTERIM EXAMINATIONS, AND THE METHOD OF TESTING

1. The interim examinations be sat as specified in the implementation procedures. Practical skills be tested during the hours allocated for practical training.
2. If no specification is made of the way in which an interim examination can be taken, because that examination applies to a unit of study that is not taught within the Faculty, and because it involves a unit of study that is not specific to students taking part in a programme administered by the Faculty of Mechanical Engineering and Marine Technology, the relevant conditions in the Course and Examination Regulations for that unit of study shall be applicable. Each year, the board of examiners under which the interim examination falls shall determine the way in which the interim examination is to be taken.
3. The appointed examiner may depart from the provisions of paragraphs 1 and 2 in a student's favour. Each student with a physical or sensory disability shall be given the opportunity to take all interim examinations and practical training in a way that, to the greatest possible extent, is adapted to the disability in question. Under this facility, the form or length of the interim examinations shall be adapted to the individual situation, or practical aids shall be made available.
4. The facilities specified in the previous paragraph should be requested from the board of examiners by the student concerned. This request should be accompanied by a medical certificate issued no more than one year previously by a doctor, psychologist or student counsellor. All requests involving dyslexia should be backed by a recognised dyslexia testing body.
5. Per year, the form in which each interim examination is to be taken shall be specified in the study guide for the actual course year under the unit of study concerned.
6. Per year, the form in which each interim examination is to be taken shall be specified in the study guide for the actual course year under the unit of study concerned.

Article 13 ORAL INTERIM EXAMINATIONS

1. Unless otherwise determined by the board of examiners, no oral interim examination shall involve more than a single student at the same time.
2. All oral interim examinations be public, unless, in exceptional circumstances, the board of examiners or the individual examiner decide otherwise, or if the student has submitted an objection.

Article 14 THE ESTABLISHMENT AND NOTIFICATION OF RESULTS

1. Immediately after taking an oral interim examination, the examiner shall announce the result, and issue the student with the relevant written notification.
2. As soon as possible after a written interim examination, and always within a maximum of 15 working days, the examiner shall declare the results. The examiner shall provide the Faculty's student administration office with the necessary details. Paying all due attention to the privacy of individual students, the student administration office shall take responsibility for the registration, publication and reporting of the results within 20 working days of the interim examination.
3. If an interim examination is taken neither in writing nor orally, but in another form, the board of examiners shall decide in advance on the way in which students will be notified of the results, and of the period within which this will occur.
4. When students be provided with written notification of the results of an interim examination, it shall at all times be made clear that they have the right to inspect the relevant examination documents (as defined in Article 15), and that they have the right to appeal to the examination appeals board.

Article 15 CANDIDATES' RIGHT TO INSPECT THEIR EXAMINATION DOCUMENTS

1. For at least one month after the results of a written examination have been announced, it shall be possible for students to inspect their examination and its assessment. At the student's request, he/she will be provided with a copy of the relevant work at cost price.
2. During the period specified in paragraph 1, it is possible for all interested parties to inspect the questions and assignments of the relevant interim examination, and also the norms whereby assessment took place. Upon request a copy of this information shall be provided at cost price.
3. The board of examiners may specify that inspection of examination documents will take place at a predetermined place at no fewer than two predetermined times. The place and dates shall be stated on the list of results. If a student can demonstrate that, due to forces beyond his or her control, it was impossible to be present at the predetermined place and time, a new opportunity shall be provided; if possible, this shall fall within the period specified in paragraph 1.

Article 16 OPTIONS FOR DISCUSSING THE RESULTS OF AN INTERIM EXAMINATION

1. As soon as possible after the results of an interim examination have been announced, student or examiner may take an initiative towards discussing the examination, and to explaining its assessment.
2. For a period of one month, starting on the day following the announcement of the results, a student who has taken a written interim examination may apply to the relevant examiner to discuss the work in question. This discussion shall follow at a place and time specified by the examiner, and always within a reasonable period.
3. If, for whatever reason, the board of examiners organises a collective discussion after an interim examination, there be only two cases in which a student may submit a request of the type specified in

the previous paragraph: either a. by being present at the collective discussion and by simultaneously providing the motives for the request; or b. when, due to circumstances beyond his or her control, it was impossible to attend the collective discussion.

4. The conditions of the previous paragraph shall also apply if the board of examiners or the examiner provides the student with an opportunity to compare his or her answers with standard answers.
5. The board of examiners may allow deviations from the stipulations of paragraphs 3 and 4.

Section 4 EXEMPTION FROM INTERIM EXAMINATIONS

Article 17 EXEMPTION FROM INTERIM EXAMINATIONS OR PRACTICAL EXERCISE

1. The board of examiners can grant students exemption from one or more interim examinations or practical exercises, if they have satisfied the examiners either with regard to earlier interim examinations, or with regard to Higher Education examinations, or with regard to knowledge and skills acquired outside higher education. However, this is possible only if they satisfy at least one of the following conditions:
 - a. the interim examination involved a unit of study that, in terms of content and study load, was equivalent to a comparable university course in the Netherlands or beyond, or at an institute of professional education (i.e. HBO institute / hogeschool) in the Netherlands.
 - b. the student can provide proof of knowledge or experience acquired either during a course provided somewhere other than at a Dutch institute of professional education, or otherwise during activities conducted in another context.
2. If the relevant examiner has made a fully motivated proposal to this effect, the board of examiners may grant exemption from an interim examination.

Section 5 THE MASTER'S EXAMINATIONS

Article 18 PERIODS AND FREQUENCY OF EXAMINATIONS

1. An opportunity to take the Master's examination shall be provided no less than twice a year. In a meeting held before the start of the academic year, the board of examiners shall establish the dates on which the examinations be to be held. These shall be published in the study guide for the programme and year in question.
2. All students can apply to take the examinations as soon as they have fulfilled the conditions of their course, and have provided the student administration office with proof of the course components they have passed.

Article 19 REPORTING ON STUDENTS' PROGRESS

1. At least once a year, each student shall be sent a written report on the progress he or she has made over the preceding period.
2. The report referred to in paragraph 1 shall be composed according to the guidelines established by the Executive Board.
3. The Dean shall be responsible for supervising the progress of all students enrolled on the course. Such supervision shall include an assessment of the options for study that be available to students, both inside the programme and beyond it.

Section 6 PROVISIONS FOR IMPLEMENTATION

Article 20 MODIFICATION OF THE REGULATIONS

1. These regulations may be modified in a special decision by the Dean.
2. No decision shall be made in respect of the current academic year, unless, by all reasonable definitions, it is unlikely to damage the interests of students.
3. No change in the regulations may negatively affect a previous decision made by the board of examiners in respect of a student.

Article 21 TRANSITIONAL RULING

1. In the event that the composition of a teaching programme is modified, or that one of the Articles of the Course and Examination Regulations is changed, the Dean shall decide on a transitional ruling, which shall then be published in the implementation procedures.
2. In all cases, this transitional ruling shall incorporate the following:
 - a. a ruling on the exemptions that be available on the basis of interim examinations that a student has already passed,
 - b. the number of times that it is still possible to sit for interim examinations under the conditions of the old programme,
 - c. the period for which the transitional ruling will be valid.

Article 22 PUBLICATION OF THE TRANSITIONAL RULING

1. The Dean shall take responsibility for publicising the following in an appropriate fashion: the transitional ruling defined in Article 21, and the implementation procedures and the changes to it.
2. The Course and Examination Regulations and the implementation procedures for each course shall be incorporated in the study guide.

Article 23 DATE OF COMMENCEMENT

These regulations shall come into force on 1 September 2003.

6.2 Implementation Procedures

for the teaching and examination regulations appropriate to the Master's programme Marine Technology

Article 1 COURSE CALENDAR

The course calendar for the programme can be found in the Study Guide for the Master's degree programme Marine Technology.

Article 2 COMPOSITION OF THE PROGRAMME

The composition of the Master's degree programme Marine Technology, including number of credit points, assessment, entrance requirements per unit of study is described in the Study Guide.

Article 3 COMPOSING FLEXIBLE STUDY PROGRAMMES

1. Students may themselves compose an individual study programme that will lead to an examination. This programme must consist, either in full or for the greater part, of units of study which be taught on the course they be attending, and may be supplemented with units taught on other courses or at other universities.
2. Each student desiring to compose a programme of the sort referred to in paragraph 1 shall submit his or her own proposal, motivating it in full, for the approval of the relevant board of examiners, i.e. at the beginning of the Master's programme.

Article 4 PROCEDURE FOR APPROVING FLEXIBLE STUDY PROGRAMMME

1. No less than two months before they intend to start on a flexible study programme, all students must submit their proposals for their choices of one or more units of study (as referred to in Article 3) for approval by the board of examiners. Each proposal must be accompanied by a clearly argued motivation.
2. Any decision not to approve the proposal shall be motivated by the board of examiners after the student in question has been given the opportunity of a hearing.
3. The board of examiners shall decide within twenty working days of receiving the application, or, if the application is submitted during an academic holiday, no more than ten working days after this holiday has ended.
4. The board of examiners can adjourn its decision for no more than ten working days. The student shall be given written notification of such adjournment within the twenty-working-day period referred to in the first sentence of paragraph 3. The student shall receive written notification of the decision without delay.

Article 5 THE ORDER OF INTERIM EXAMINATIONS AND ASSIGNMENTS

The order in which the interim examinations will be taken, assignments shall be fulfilled or in which students be to participate in practical training, is laid down by means of entrance requirements, specified in the description of the contents of the programme in the Study Guide.

Article 6 MASTER'S THESIS

1. The programme is concluded by fulfilling a final assignment and presenting a Master's thesis.
2. The Master's thesis is assessed by an examining committee, assigned by the board of examiners.
3. The student applying for the Master's examination has to defend his thesis before the examining committee mentioned sub 2.

Article 7 VARIANTS AND ANNOTATIONS

1. The Marine Technology MSc-programme is provided in two variants:
 - Science
 - Design, Production and Operation
2. As an addition to the variant programme there are three annotations. After completing such an annotation, the student acquires a supplement to the MSc-degree, which declares a more than average knowledge about that subject. These annotations are:
 - Technology in Sustainable Development.
 - Technical Marketing
 - Offshore Technology
3. Further details and requirements be laid down in the study guide.

Article 8 PARTICIPATION IN THE PROJECT "TU DELFT HELPS REDUCE THE SHORTAGE OF TEACHERS"

Within the framework of the project "TU Delft helps reduce the shortage of teachers in Dutch pre-university education", students can take part in the course "TU Delft/Teachers for schools". This course comprises two parts, a preparatory course and a supervision phase. The total course leads to the award of 9 EC, which should be allocated within the elective subjects.

Laid down by the Dean of the Faculty Mechanical Engineering and Marine Technology , after the approval of the Faculty's Student Council, and after considering the recommendations provided by the education committee on 10-6-2002.

6.3 Regulations and guidelines for the board of examiners

Article 1 SCOPE OF THE REGULATIONS

These regulations and guidelines are applicable to the teaching of, and examinations for, the Master's degree programme in Marine Technology, hereafter referred to as *the programme*.

Article 2 DEFINITIONS

- 1 When used in these regulations and guidelines, the term Course and Examination Regulations (CER), refers to the current course and examination regulations as intended under Article 7.12 of the Higher Education and Academic Research Act (abbreviated in Dutch as WHW);
- 2 All other terms occurring in these Regulations will have the same meaning as that intended in the CER and the WHW.

Article 3 DAY-TO-DAY ADMINISTRATION

The board of examiners consists of the lecturers who are engaged in the educational programme and mentioned as such in the curricula, described in section 1.5 of the study guide. The board of examiners shall appoint a chair and a secretary from its members. The chair shall be responsible for the day-to-day management of the committee.

Article 4 MASTER'S EXAMINING COMMITTEE

1. The board of examiners appoints a Master's examining committee for the assessment of each Master's thesis.
2. A master's examining committee consists of no less than three members.
3. The professor in charge is chairman of the committee.
4. No less than one member belongs to the scientific staff of the section responsible for the specialisation concerned; no less than one member belongs to the scientific staff of a different section of Delft University of Technology.
5. The committee can be completed by experts from outside the University.

Article 5 ENTRY FOR INTERIM EXAMINATIONS

- 1 Students shall apply for interim examinations at the Faculty's Department of Educational and Student Affairs by entering data in the examination application system, or, if the system is not in use, by completing and submitting a form made available by the Department of Educational and Student Affairs. Whatever the means of application, all submissions must be received no less than ten working days before the interim examination.
- 2 In exceptional cases, the board of examiners can depart from the application period defined in paragraphs 1 and 4 of this Article, provided that this departure is in the favour of the student concerned.
- 3 Admission to the interim examination will be granted solely to those students who are registered on the list of applicants produced by the examination application system (or by any alternative system currently in force).

- 4 If, in their opinion, students have not been able to apply for an interim examination due to events beyond their control, they shall apply to the board of examiners no less than two full working days before the day for which the examination is planned. By submitting a declaration of demonstrable *force majeure* written or issued by, or on behalf of, the board of examiners, the student may be allowed to sit the relevant examination.

Article 6 ORDER DURING AN INTERIM EXAMINATION

- 1 With regard to written interim examinations, the board of examiners and/or the appointed examiner shall be responsible for appointing invigilators who, on behalf of and under the authority of the board of examiners will ensure that the examination runs smoothly.
- 2 If asked by, or on behalf of, the board of examiners, all candidates shall identify themselves by showing their campus card.
- 3 Candidates shall observe all instructions that have been published before the start of the examination by the board of examiners, or by the examiner or invigilator. They shall also follow instructions given during the examination and immediately after it has finished.
- 4 If a candidate fails to fulfil the conditions of the paragraphs 2 and 3 of this Article, the board of examiners or the appointed examiner can exclude him or her from further participation in the interim examination. The consequence of such exclusion is that no result is established for the examination in question. Before taking such a decision, the board of examiners shall offer the student concerned an opportunity to state his or her case.
- 5 The time allotted for each interim examination shall, by all reasonable standards, be long enough to allow candidates sufficient time to answer its questions.
- 6 When the interim examination has finished, candidates may keep the assignment papers. The exception to this rule concerns examinations in which questions and answers must be handed in together.
- 7 Candidates may not enter the examination room until the invigilator gives permission.
- 8 No candidates are admitted into the examination room no later than half an hour after the official start of the examination.
- 9 Candidates are not allowed to leave the examination room within the first half hour following the official start of the examination. After this time, permission to leave the room temporarily will be given only in urgent cases. No more than any one candidate may be absent at the same time.
- 10 Under no circumstances may items such as briefcases, bags and mobile telephones be used or handled in the examination room.
- 11 Although candidates are responsible for bringing their own calculators and their own writing and drawing materials, the faculty will provide answer sheets and scrap paper.
- 12 In the event that a certain examination requires students to use calculators, these calculators may at no time be able to exceed the maximum capabilities specified by the lecturer for that subject. In general, programmable calculating equipment is not allowed. (Generally examination assignments should be formulated such that they can be carried out with a simple calculator; at no times should candidates with more complex calculators have an advantage.)
- 13 Candidates may not write their answers in pencil, unless the lecturer has given prior permission for this.
- 14 During the interim examination, candidates may not consult books, readers, etc., unless the lecturer has given prior permission for this.
- 15 If an invigilator catches a candidate or candidates cheating, the procedure described in Article 6,

- paragraph 2 of these regulations will be applicable.
- 16 Before permanently leaving the examination room (i.e. no less than 30 minutes after the start of the interim examination), candidates must, at minimum, submit the front page of the answer sheet. This must bear their name and student number.
- 17 Before the interim examination begins, the invigilator shall instruct the candidates on the procedure they must follow if they leave the examination room without completing all the examination assignments.
- 18 Students who believe they may qualify for examination in a different form, should, as specified in Article 12 paragraphs 4 and 5 of the CER¹, submit a fully motivated request for this to the chair of the board of examiners.

Article 7 CHEATING

- 1 Cheating is defined as any act committed by a student for the purpose of making it partly or wholly impossible to make a correct assessment of his or her knowledge, insight and skills.
- 2 If a student is found to be cheating as defined in paragraph 1 of this Article, the board of examiners can decide to exclude him from the interim examination in question.
- 3 The decision to exclude a student as defined in paragraph 2 of this Article shall be taken on the basis of the invigilator's report of the cheating.
- 4 In urgent cases, the invigilator is entitled to act on behalf of the board of examiners by immediately excluding the student or students concerned. The board of examiners shall ensure that, immediately after the interim examination, the report defined in paragraph 3 of this Article is made in writing; and that a copy is issued to the student or students concerned.
- 5 Within 20 days of his or her exclusion, such a student may appeal to the board of examiners to reverse their decision. To this appeal, the student will attach a copy of the report defined in paragraph 4 of this Article; this may also be accompanied by the student's own written testimony.
- 6 Before deciding on an appeal of the sort defined in paragraph 5 of this Article, the board of examiners shall give both student and examiner the opportunity of a hearing.
- 7 The board of examiners will decide on any reversal of the original decision within 30 working days of receiving the student's appeal.
- 8 The consequence of exclusion is that no examination result will be recorded for the interim examination intended under paragraph 2 of this Article.
- 9 In the event of cheating, the board of examiners can decide, conditionally or unconditionally, to exclude the student from all further interim examinations for a maximum period of one year.

Article 8 CRITERIA

When taking the decisions that are integral to their duties, the board of examiners and, where appropriate, the examiner, shall be guided by the criteria stated below. When these criteria conflict, the board shall carefully weigh the interests of allowing one criterion to prevail over another. At all times, these standards must ensure that the following conditions are met:

- a that the criteria regarding quality and selection inherent to an interim examination are maintained;
- b that the need for efficiency is met, particularly by limiting to a minimum any time loss that would hinder those students whose preparations for examinations and interim examinations are running to schedule;
- c that students who wish to assume too great a study load should be protected from themselves;

¹ Course and Examination Regulations

- d that clemency should be shown in all cases in which students' progress is slowed by circumstances beyond their control.

Article 9 QUESTIONS AND ASSIGNMENTS

- 1 The scope of an interim examination, and the sources upon which it is based, shall be announced no less than a month before that examination takes place. No questions or assignments in the examination may go beyond the scope of these sources.
- 2 To the greatest possible extent, the questions and assignments of each interim examination shall be evenly distributed over the material being examined.
- 3 Both in content and form, each interim examination shall represent the learning objectives stated.
- 4 All questions and assignments shall be clear and explicit.
- 5 Well in advance of each interim examination, the board of examiners or the examiner shall announce the form of examination and method of testing as meant under Article 12 of the CER.
- 6 Well in advance of each written interim examination, the board of examiners or the examiner shall provide an opportunity whereby students intending to participate in it can examine a similar test on the same subject, together with sample answers and the norms that would be applied during its assessment.

Article 10 ASSESSMENT

- 1 The assessment of an interim examination is expressed in whole numbers on a scale from 1 to 10, with 6 signifying a pass. If desired, practical training can also be assessed as a "pass" or a "fail". All exemptions for a subject are treated as a 6, i.e. a pass.
- 2 Students pass their Master's examinations by satisfying the examiners in each component of the Master's programme. Students awarded a 5 in a single subject excepting the thesis project will also qualify for the award of their Master's degree.
- 3 Per subject, the highest mark awarded for an interim exam will be recorded on the examination certificate.

Article 11 THE ESTABLISHMENT OF EXAMINATION RESULTS²

- 1 The votes of the board of examiners shall be established by a simple majority of votes.
- 2 If the votes are equally divided, the chair of the board of examiners shall have the casting vote, unless the vote takes place in writing.
- 3 If, in a written vote, the votes are equally divided, there shall be a second ballot. If this, too, leads to an equal division of votes, the proposal being balloted shall be rejected.

Article 12 CUM LAUDE

- 1 At the discretion of the board of examiners, a candidate for the Master's degree can receive the designation "cum laude" if he or she meets the following conditions:
 - a the mark awarded to the components specified in the Master's examination implementation procedures, excluding the mark awarded for the Master's thesis project, shall average no less than 7.5 in a list that contains no marks below 6;

² For the period within which students shall be notified of the results of interim examinations, see Article 14 of the Course and Examination Regulations (CER) for the Master's degree programmes.

- b the candidate concerned shall have completed the Master's degree programme in no more than two and a half years;
 - c the mark awarded for the thesis project shall be no less than 8;
 - d the examiner of the graduation assignment shall have submitted a proposal for the award of "cum laude".
- 2 When establishing the elapsed study time referred to in paragraph 1 subsection b of this Article, all due account should be taken of any delays caused by circumstances qualifying the candidate for support under the "Regeling Financiële Ondersteuning Studenten" (RFOS)
- 3 At all times, the board of examiners has the authority to decide on awarding the designation "cum laude" in cases that fall outside the provisions defined above.

Article 13

MASTER'S DEGREE CERTIFICATES AND STATEMENTS

- 1 To establish that a candidate has satisfied the examiners in the Master's examinations, the board of examiners shall issue a degree certificate. This shall be signed by the chair and the secretary to the board of examiners.
- 2 a The degree certificate as intended under paragraph 1 shall list the specific components of the examination, and, where appropriate, the competencies associated with them.
b The degree certificate shall be accompanied by marks lists in both Dutch and English.
- 3 If a candidate's performance during the examinations testifies to exceptional abilities, the board of examiners can, under the conditions stated in Article 11 of these Regulations, decide to grant the designation "cum laude" on the degree certificate.
- 4 Any student who has successfully completed more than one interim examination and to whom, upon his or her leaving the university, a degree certificate as intended in paragraph 1 of this Article cannot be awarded, shall, upon his or her request, receive a statement from the board of examiners in question.

Article 14

PROCEDURE FOR APPROVALS

- 1 Any student wishing to submit a request as intended under Article 7.3 paragraph 4 of the WHW (i.e. with regard to a flexible study programme) should do so on a timely basis, ensuring that, by all reasonable definitions, there is time for approval to be given before he or she takes the first interim examination. In this, he or she should take full account of the period within which the board of examiners is entitled to decide (see Article 14, paragraph 1). The request shall be accompanied by a clearly argued motivation, and, if necessary, by material that supports it.
- 2 Students shall submit to the board of examiners any requests for exemption from an interim examination or practical exercise as intended under Article 17 of the CER. The board of examiners shall decide on this after taking advice from the student counsellor. The periods within which decisions shall be taken are defined in Article 14, paragraph 2 of these Regulations and Guidelines.
- 3 If a student wishes to depart from the teaching programme prescribed in the implementation procedures, he or she shall submit a request to this effect, ensuring that, by all reasonable definitions, there is time for approval to be given before the date of the first interim examination that deviates from that programme. In this, full account should be taken of the period within which the board of examiners is entitled to decide (see Article 13, paragraph 1).

- 4 A decision to withhold approval for a request of the type intended under paragraphs 1, 3 and 4 of this Article must be fully motivated by the Board of Examiners, and may only be made after the student has been given the opportunity of a hearing, where the student may call upon the assistance of the student counsellor.
- 5 The student will immediately be informed in writing of a decision on any of the matters intended under paragraphs 1, 2, 3 and 4 of this Article. If the board of examiners concerned has not made a decision during the time period prescribed in article 14, paragraph 1, or otherwise during the period of adjournment, approval will be understood to have been granted.

Article 15 TIME PERIODS

- 1 A decision on a request such as those described in Article 13, paragraph 1 or 4 shall be made within 40 working days of its receipt; or, if the request was submitted either during an academic holiday or within a period of three weeks before the start of an academic holiday, it shall be made within a period of 40 working days after the end of the holiday. The board of examiners may adjourn a decision for no more than 10 working days. The student will be notified in writing of any such adjournment before the end of the 40-day period specified in the first sentence of this paragraph.
- 2 The provisions of the previous paragraph will also be applicable to requests such as those described in Article 13 paragraph 3, on the understanding that the time period will start from the moment that the recommendations of the student counsellor have been submitted. The student counsellor shall submit these recommendations to the board of examiners no more than 10 working days after receiving the student's request.

Article 16 RIGHT OF APPEAL

Within four weeks of the event in question, students can appeal to the examinations appeals board against the following: a ruling by the board of examiners, a ruling by an examiner, or their treatment during an examination as defined in Article 7.60 WHW.

Article 17 MODIFICATION OF THESE REGULATIONS AND GUIDELINES

No decision shall be made in respect of the current academic year, unless, by all reasonable definitions, it is unlikely to damage the interests of students.

Article 18 DATE OF COMMENCEMENT

These regulations will come into effect on 1 September 2003.

Approved by the board of examiners of the Master's programme in Marine Technology on 10 June, 2002.

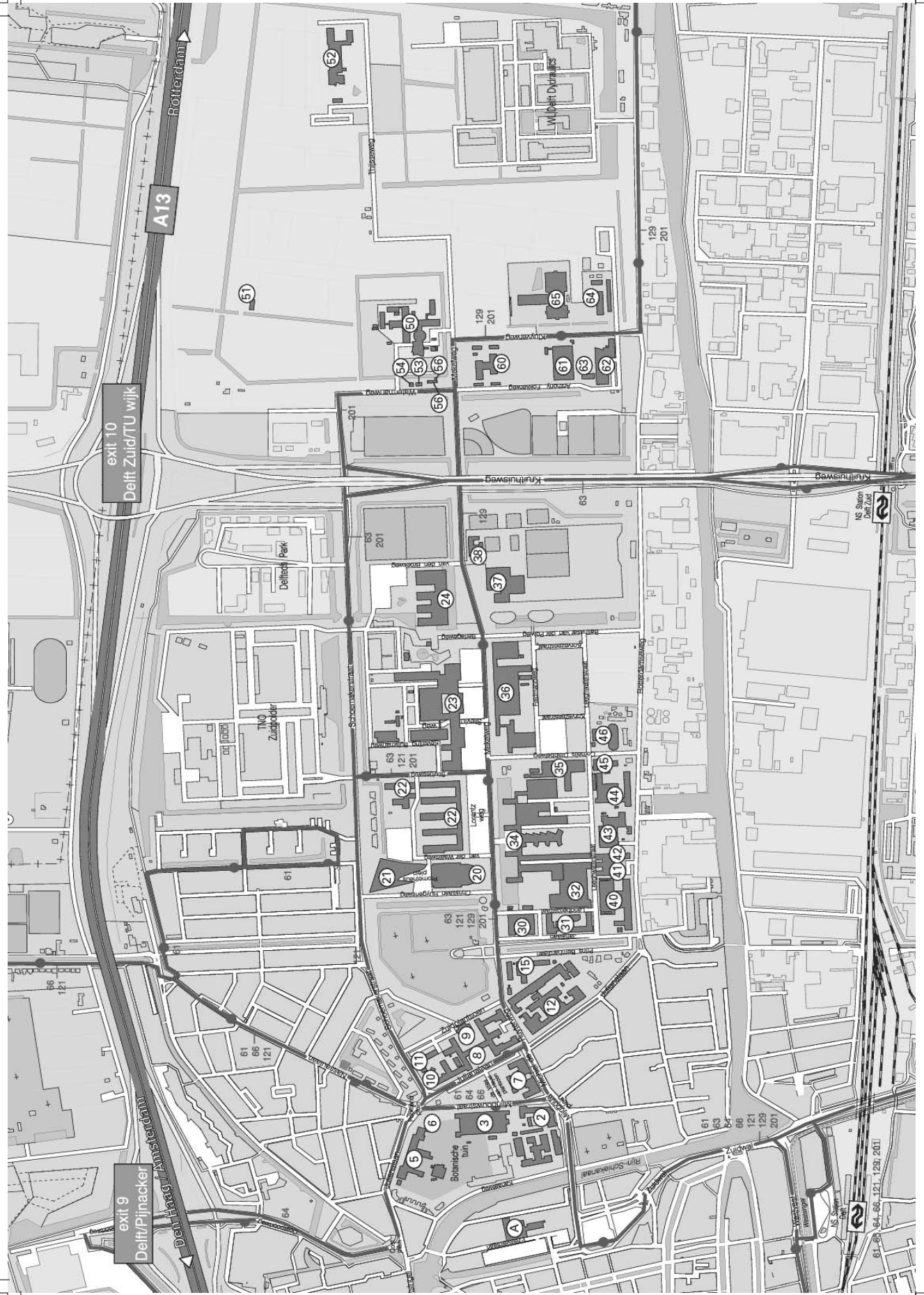
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| Meersman, prof. dr. H. | 84682 | h.meersman@wbmt.tudelft.nl | 7-1-122 | WbMT |
| Nienhuis, dr. ir. U. | 85306 | u.nienhuis@wbmt.tudelft.nl | 7-1-104 | WbMT |
| Pinkster, ir. J. | 82544 | j.pinkster@wbmt.tudelft.nl | 7-0-117 | WbMT |
| Pinkster, prof.dr.ir. J.A. | 83598 | j.a.pinkster@wbmt.tudelft.nl | 7-1-127 | WbMT |
| Santema, prof.mr.dr.ir. S.C. | 83076 | s.c.santema@io.tudelft.nl | 4A-03 | IO |
| Stapersma, prof.ir. D. | 83051 | d.stapersma@wbmt.tudelft.nl | 7-1-122 | WbMT |
| Terwisga, prof.dr.ir. T.J.C. van | 86860 | t.j.c.terwisga@wbmt.tudelft.nl | 7-1-131 | WbMT |
| Vink, ir. J. H. | 85923 | j.h.vink@wbmt.tudelft.nl | 7-1-133 | WbMT |
| Van de Voorde, prof. dr. E | 84682 | e.vandevoorden@wbmt.tudelft.nl | 7-1-122 | WbMT |
| Wagt, ing. J. van der | 87430 | j.vanderwagt@wbmt.tudelft.nl | 7-1-104 | WbMT |
| Wilde, ir. Jac. de | 83757 | jac.dewilde@wbmt.tudelft.nl | 7-1-120 | WbMT |

For other phone numbers the student can call the universal TU number (015 27 89111) or the reception of the faculty (015 27 86666)

¹ Phone numbers in full are 015-27.....or +31-15-27... when calling from abroad

² API: Leeghwaterstraat 44, 2628 CA Delft
 CITG: Stevinweg 1, 2628 CN, Delft
 IO: Landberghstraat 15, 2628 CE Delft
 ITS-et: Mekelweg 4, 2628CD Delft
 LR: Kluyverweg 1, 2629 HS Delft
 TBM: Jaffalaan 5, 2628 BX Delft
 TNW: Lorentzweg 1, 2628 CJ Delft
 WbMT: Mekelweg 2, 2628CD Delft



Rotterdam

A13
Delft Zuid/TU wijk
exit 10

Delft/Pinacker
Delft Zuid
Amsterdam
exit 9

NS Station
Delft Zuid

NS Station
Delft Zuid

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61-66, 121, 129, 201

Legend Campus map

| | | | |
|----|---|----|---|
| 3 | Faculty Applied Earth Sciences | 36 | Faculty Electrical Engineering, Media and Knowledge technology, Technical Computer Science and Technical Mathematics |
| 5 | Faculty Life Science and Technology, Botanical Garden | 34 | Faculty Mechanical Engineering and Maritime Technology, Board of Governors, Staff Board of Governors, TopTech Courses |
| 6 | VSSD | 37 | Sports center |
| 7 | Alumni Desk, Facilitating Service | 38 | Cultural Center 'Mekelweg 10', Studium Generale |
| 10 | Master of Science International Programme | 40 | Faculty Technical Material Sciences |
| 12 | Faculty Chemical Technology | 41 | Service Technical Support |
| 20 | Auditorium, Congress center, University foundations Delft, TU Shop | 43 | Energy and Building Management |
| 21 | Library TU Delft, Delft University Press | 45 | Doc Vision Support Center Delft |
| 22 | Faculty Technical Physics | 46 | Machinery design for the process industry |
| 23 | Faculty Civil Technology, Management center for International Cooperation | 52 | Faculty Geodesy |
| 24 | Faculty Architecture | 60 | Logistics and Milieu Services |
| 31 | Faculty Technical Management Science | 62 | Faculty Aerospace Engineering |
| 32 | Faculty Industrial Design | | |

A description and the exact addresses of all the numbers can be found on the homepage of the TU Delft. In this table are only the numbers published which are of interest for the student of the MSc course Mechanical Engineering or Marine Technology.

COURSE SCHEDULE MARINE TECHNOLOGY MSC 1ST YEAR 2003-2004

| MT4 | SEMESTER 1A week 36 tm 42 | | | | SEMESTER 1B week 45 tm 51 | | | | SEMESTER 2A week 5 tm 11 | | | | SEMESTER 2B week 14 tm 21 (week 19 vakantief) | | | | | |
|-----|------------------------------|---------------------------|--------------|----------|------------------------------|----------------------------|--------------|-------|-----------------------------|-----------------------------|-----------------|-------|--|--------------------------|-----------------|-------|------|--|
| | Day/hour | Course name | Lecturer | Code | Room | Course name | Lecturer | Code | Room | Course name | Lecturer | Code | Room | Course name | Lecturer | Code | Room | |
| | 1 | | | | | | | | | | | | | Maritime Business Game | | | | |
| | 2 | | | | | | | | | | | | | Maritime Business Game | | | | |
| MO | 3 | Ship design 3 (1) | Lagers | mt112 | 34L | Shipyard processes | Nienhuis | mt727 | 34K | Composite materials (1) | Leenders | mt816 | 34K | | | | | |
| | 4 | Ship design 3 (1) | Lagers | mt112 | 34L | Shipyard processes | Nienhuis | mt727 | 34K | Composite materials (1) | Leenders | mt816 | 34K | | | | | |
| | 5 | Ship design 3 (1) | Lagers | mt112 | 34L | Integr. loads and strength | Vink/Journee | mt835 | 34K | | | | | | | | | |
| | 6 | Ship design 3 (1) | Lagers | mt112 | 34L | Integr. loads and strength | Vink/Journee | mt835 | 34K | | | | | | | | | |
| | 7 | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | |
| TU | 1 | | | | | Advanced programming | Hommel | mt836 | 34F | Advanced programming | Hommel | mt836 | 34F | | | | | |
| | 2 | Law for MT | Wijfing e.a. | wm0732mt | 34B | Advanced programming | Hommel | mt836 | 34F | Advanced programming | Hommel | mt836 | 34F | | | | | |
| | 3 | Law for MT | Wijfing e.a. | wm0732mt | 34B | Hydromech.spec.shiptypes | Keuning | mt524 | 34F | Application of FEM | Hommel | mt830 | 34F | | | | | |
| | 4 | Offshore technology | Lagers | mt411 | 34E | Hydromech.spec.shiptypes | Keuning | mt524 | 34F | Application of FEM | Hommel | mt830 | 34F | | | | | |
| | 5 | Offshore technology | Lagers | mt411 | 34E | | | | | Ship motions & control 3 | Pinkster JA | mt514 | 34F | | | | | |
| | 6 | Offshore technology | Lagers | mt411 | 34E | | | | | Ship motions & control 3 | Pinkster JA | mt514 | 34F | | | | | |
| | 7 | | | | | | | | | Internal combustion engines | Klein Woud | mt216 | 34F | | | | | |
| | 8 | | | | | | | | | Internal combustion engines | Klein Woud | mt216 | 34F | | | | | |
| WE | 1 | Marine engineering B | Klein Woud | mt212 | 34L | | | | | | | | | | | | | |
| | 2 | Marine engineering B | Klein Woud | mt212 | 34L | | | | | | | | | | | | | |
| | 3 | Resistance propulsion 3 | Tervisga v. | mt515 | 34F | Shipping management | Vandevoorde | mt313 | 34F | Numerical methods for MT | Pinkster/Hommel | mt523 | 34F | | | | | |
| | 4 | Resistance propulsion 3 | Tervisga v. | mt515 | 34F | Resistance propulsion 3 | Tervisga v. | mt515 | 34L | Shipping management | Vandevoorde | mt313 | 34F | | | | | |
| | 5 | Resistance propulsion 3 | Tervisga v. | mt515 | 34F | Project management | Nienhuis | mt726 | 34L | Ship finance | Nienhuis | mt724 | 34J | | | | | |
| | 6 | Design meth. & knowl.eng. | Klein Woud | mt217 | 34F | Project management | Nienhuis | mt726 | 34L | Ship finance | Nienhuis | mt724 | 34J | | | | | |
| | 7 | Design meth. & knowl.eng. | Klein Woud | mt217 | 34F | Project management | Nienhuis | mt726 | 34L | Ship finance | Nienhuis | mt724 | 34J | | | | | |
| | 8 | Law for MT | Wijfing e.a. | wm0732mt | 34B | Project management | Nienhuis | mt726 | 34L | Ship finance | Nienhuis | mt724 | 34J | | | | | |
| TH | 1 | Law for MT | Wijfing e.a. | wm0732mt | 34B | | | | | | | | | | | | | |
| | 2 | Law for MT | Wijfing e.a. | wm0732mt | 34B | | | | | | | | | | | | | |
| | 3 | | | | | Ship design 4 | Frouws e.a. | mt113 | 34D | | | | | | | | | |
| | 4 | | | | | Ship design 4 | Frouws e.a. | mt113 | 34D | | | | | | | | | |
| | 5 | Offshore technology | Lagers | mt411 | 34F | Inland shipping | Dirkse | mt725 | 34L | Constr.strength s.s | Vink/Hommel | mt815 | 34E | | | | | |
| | 6 | Offshore technology | Lagers | mt411 | 34F | Inland shipping | Dirkse | mt725 | 34L | Constr.strength s.s | Vink/Hommel | mt815 | 34E | | | | | |
| | 7 | | | | | | | | | Constr.strength s.s | Vink/Hommel | mt815 | 34E | | | | | |
| | 8 | | | | | | | | | Constr.strength s.s | Vink/Hommel | mt815 | 34E | | | | | |
| FR | 1 | | | | | | | | | | | | | Application of FEM | Hommel | mt830 | 34F | |
| | 2 | | | | | | | | | | | | | Application of FEM | Hommel | mt830 | 34F | |
| | 3 | Ship design 3 (1) | Lagers | mt112 | 34L | Marine engineering C | Grimmelius | mt213 | 34K | Ship repair, salvage | Dirkse | mt728 | 34K | Numerical methods for MT | Pinkster/Hommel | mt523 | 34K | |
| | 4 | Ship design 3 (1) | Lagers | mt112 | 34L | Marine engineering C | Grimmelius | mt213 | 34K | Ship repair, salvage | Dirkse | mt728 | 34K | Numerical methods for MT | Pinkster/Hommel | mt523 | 34K | |
| | 5 | Ship design 3 (1) | Lagers | mt112 | 34L | | | | | Integr. loads and strength | Vink/Journee | mt835 | 34K | Vibration noise ships | Hyariades | mt814 | 34F | |
| | 6 | Ship design 3 (1) | Lagers | mt112 | 34L | | | | | Integr. loads and strength | Vink/Journee | mt835 | 34K | Vibration noise ships | Hyariades | mt814 | 34F | |
| | 7 | | | | | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | | | | | |

1) college uitsluitend in week 39. In week 40 tm 42 ontwerpo

1) blokcollege in week 22

