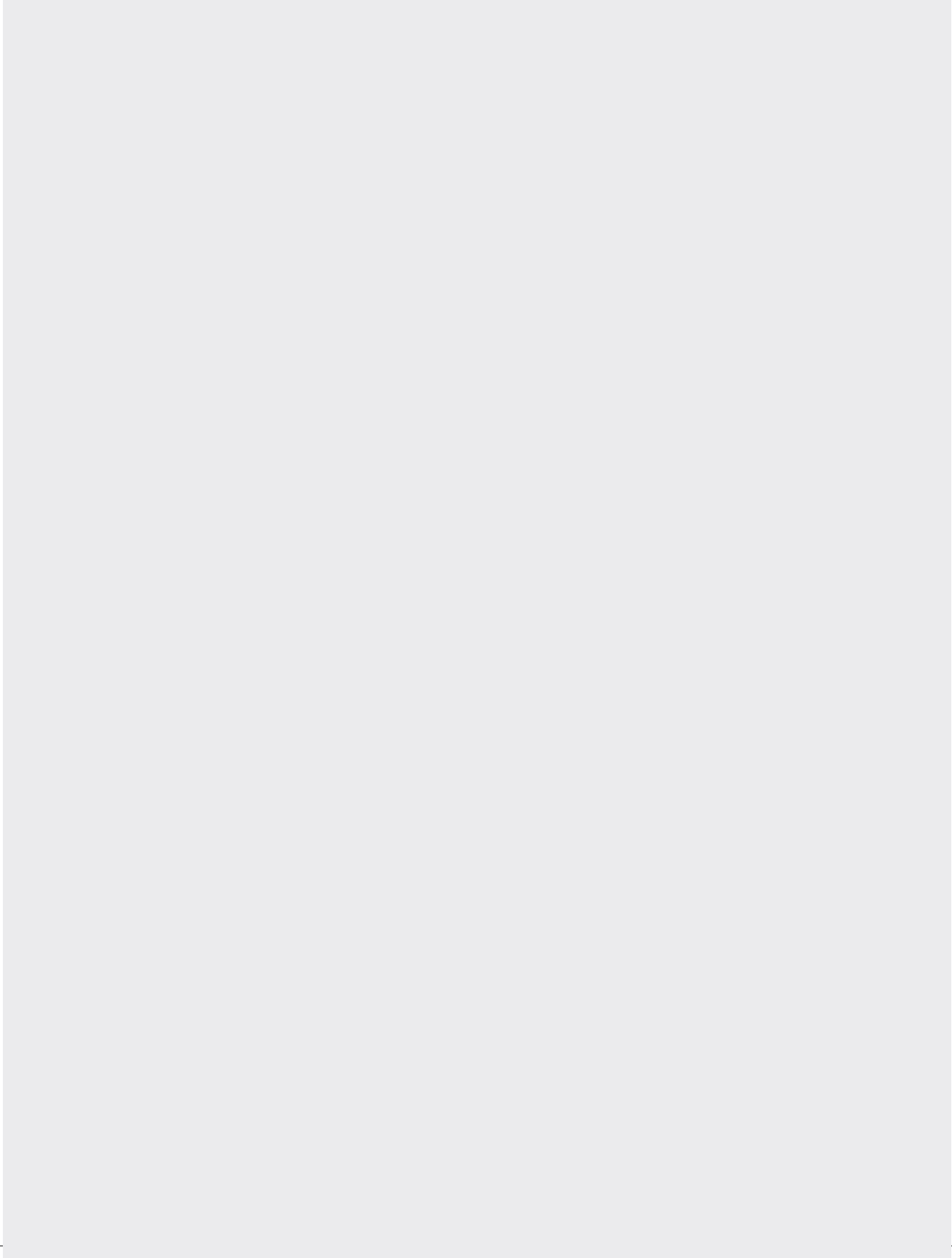
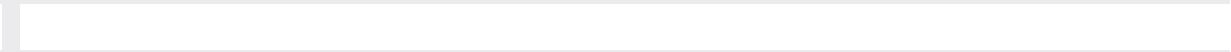
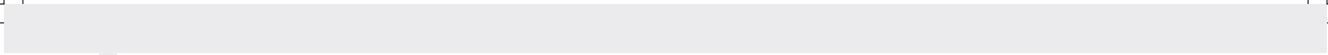


## **MT - Compass**



**Master** **2004 - 2005**  
**MT-Compass**  
**Study guide Master programme Marine Technology**

## Colophon



- Cover CSO Deep Blue, with courtesy of IHG Gusto Engineering B.V.
- Text Education Support Staff
- Word processing Student assistant Hans van Schuppen
- Styling Corrie van der Lelie and Hans van Schuppen
- Press Deltahage, Den Haag
- July 2004 Edition of 400 pieces
- Disclaimer 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>  
No rights can be derived from the information in this study guide.



## Preface

The MT-Compass 2004 –2005 has the same lay out as in previous years. The study programmes also have the same structure as in the past.

The study programme is now offered in 2 variants:

- Design, Production and Operation
- Science

Two other master study programmes may be of interest to Bachelors Maritieme Techniek: Materials Science and Engineering and Offshore Engineering. Study Guides can be obtained from the Study Administration Office.

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.

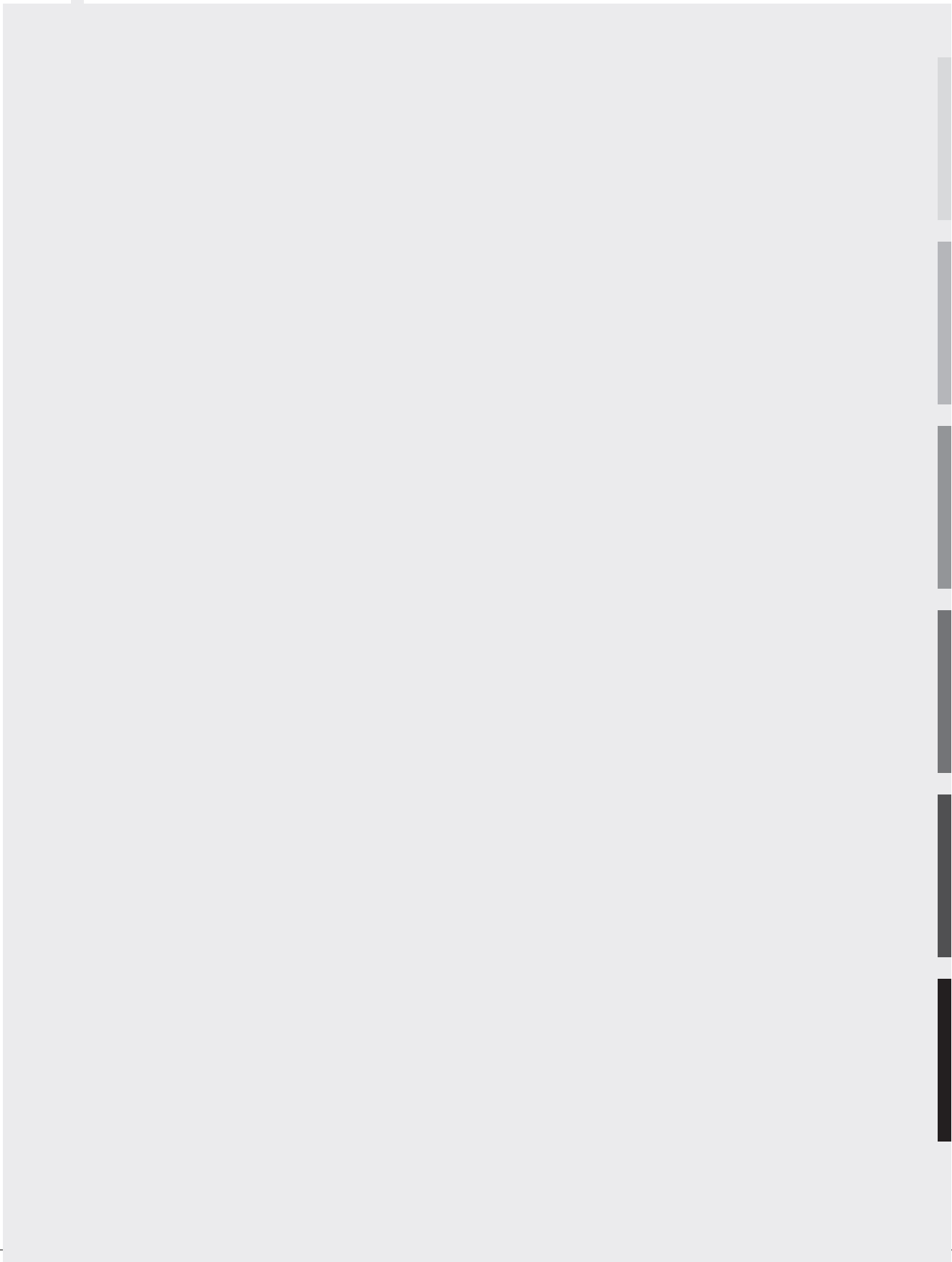
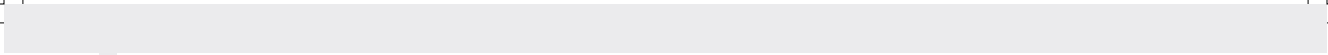
The editors of this guide wish all students a pleasant and successful study year.

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

# Table of Contents

<b>1</b>	<b>MSc Marine Technology</b>	<b>12</b>
1.1	Goal	12
1.2	Educational Concept and Assessment	12
1.3	Study programme and general structure	13
1.4	Admission to the programme	14
1.4.1	Academic bachelor degree	14
1.4.2	Marine Technology Bachelor degree of Dutch polytechnic HZS	16
1.5	MSc-programme Marine Technology	18
1.5.1	Variant Science	19
1.5.1.1	Specialisation Hydromechanics	20
1.5.1.2	Specialisation Ship and Offshore Construction	22
1.5.2	Variant Design, Production and Operation	25
1.5.2.1	Specialisation Marine Engineering	26
1.5.2.2	Specialisation Shipbuilding	28
1.5.2.3	Specialisation Ship Design	31
1.5.2.4	Specialisation Shipping Management	32
1.5.2.5	Specialisation Offshore Units Design	34
1.5.3	Annotations	36
1.5.4	Technical University Teacher Course (TULO)	38
1.6	Enrolling for courses and tests	38
1.7	Pass rules and criteria for 'honours-degree'	39
1.8	Honours Track	39
1.9	Study and internship abroad	39
1.10	Profile of the Marine Technology Engineer	41
1.11	Cheating, Citation and plagiarism	42
<b>2</b>	<b>Organisation</b>	<b>46</b>
2.1	Faculty	46
2.2	Education support staff	46
2.3	Education committee	47
2.4	Board of examiners	47
2.5	Students association	48
2.6	Student guidance	50
2.7	Working conditions, RSI and harrassment	52
2.8	Quality Control	53
2.9	Information services	53
2.10	Rules and Regulations	54

<b>3</b>	<b>Facilities</b>	<b>60</b>
3.1	Lecture Rooms / Meeting Rooms	60
3.2	Individual study facilities	61
3.3	Computer rooms	61
3.4	Research facilities	62
3.5	Library	62
3.6	Lecture notes	63
3.7	Mailbox and access to the internet	64
3.8	Available software	65
3.9	Catering	63
<b>4</b>	<b>TU - Services for students</b>	<b>68</b>
<b>5</b>	<b>Course descriptions</b>	<b>71</b>
<b>6</b>	<b>Appendices</b>	<b>83</b>
6.1	Course and Examination Regulations	84
6.2	Implementation Procedures	91
6.3	Regulations and guidelines for the board of examiners	93
6.4	Lecturers	99
6.5	Campus Map	100
6.6	Course Schedules	102
6.7	Campus map	103





**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 profound 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 consists of two course years, each with a study load of 60 EC (European credits). The total programme thus amounts to 120 EC. The study programme is divided in lecture courses and assignments:

### Lecture courses (50-70 EC)

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

As a minimum, the courses should include 6 EC social courses and 9 EC fundamental engineering courses.

In general, lecture courses are assessed by means of a written examination.

### Assignments (50 - 70 EC)

In general the assignments are carried out individually, but some assignments are done in a group.

The requirements for assignments and lecture courses are specified in paragraph 1.5, depending on the specialisation.

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. This may be combined with the MSc-thesis, if performed in cooperation with and at the office of an external party.
- MSc-thesis (35 - 60 EC)
- Other individual or group assignments.

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

**MSc-thesis** 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 examiners from external partners.

### 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. 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. The study load for one study year is 60 EC. These EC give an indication of the weight of the course. One EC involves 28 hours of study. These 28 hours include all time spent on the course: lectures, self study, internship, assignments, examinations, etc.

European credits are according the European Credit Transfer System (ECTS). This system encourages acknowledgement of study results throughout the European Union.



## 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 (1.4.1), admission is however also possible after completing a Bachelor-programme of a polytechnic high school or 'Hoge Zeevaartschool' (1.4.2).

### 1.4.1 Academic bachelor degree

#### **Academic BSc-degree Marine Technology**

Students with an academic BSc-degree Marine Technology of Delft University of Technology (DUT) can enter the MSc programme without selection. The student can be conditionally admitted to the MSc-programme, to take part in interim examinations of a few MSc-courses, if the examinations committee approves. Requirements for conditional admission are: the student has passed the propaedeutic examination and a study result of the second and third year of at least 100 EC, including the BSc-thesis. Final admittance is granted after completing the BSc-programme.

#### **DUT BSc-degree Mechanical Engineering (ME), Civil Engineering (CI), Aerospace Engineering (AE), Industrial Design Engineering (IDE) and Applied Physics (AP)**

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 45 EC or less. 15 EC of these additional courses will be part of the elective courses and max 30 EC will be part of an additional programme. The total programme will amount to:  $120 + \max 30 = \max 150$  EC. These additional requirements will ensure that the student has at least an entrance level comparable to the second-course year of the Marine Technology BSc-programme. The lecturer of the concerning specialization may require that also a number of third year courses of the BSc-programme is done additionally.

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

The additional courses are as follows:

Course code	Course name	Credits	Bachelors				
			AE	ME	CI	IDE	AP
et2019mt	Electrische aandrijvingen	3				X	X
mk6010mt	Materiaalkunde 1	2.5					X
mt215	Marine Engineering A	2	X	X	X	X	X
mt517	Geometry and Stability of ships	2	X	X	X	X	X
mt518	Resistance and Propulsion 1	2	X	X	X	X	X
mt519	Ship motions and manoeuvring 1	1.5	X	X	X	X	X
mt731	Ship Production 2	2	X	X	X	X	X
mt803	Ship Constructions 2	3.5	X	X	X	X	X
mt806	Sterkteleer 2	3				X	X
mt825	Inl. Eindige Elementen Methode	1.5				X	X
mtp203	Project 2-3: Design 1	5	X	X	X	X	X
wb1111mt	Statica 1 (DIP)	4					X
wb1112mt	Sterkteleer 1 (DIP)	4					X
wb1126mt	Thermodynamics 1	2			X	X	
wb2104	Systems and Control Engineering 1	2			X	X	
wi2256th	Lin. Algebra 1 en 2 th	6				X	
<b>Total additional credits (EC)</b>			<b>19</b>	<b>19</b>	<b>23</b>	<b>34,5</b>	<b>36</b>

### Other BSc-degree University of Technology

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 15 EC. In this case the total study programme will involve 120 EC.
- Admission with additional requirements between 15 and 45 EC. In this case 15 EC are part of the 120 EC of the regular MSc-programme and 30 EC at most are additionally required above the regular MSc-programme. The total study programme will involve  $120 + \max 30 = \max 150$  EC.
- 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, to take part in interim examinations of a few MSc-courses, if the examinations committee approves. Requirements for conditional admission are: the student has passed the propaedeutic examination and a study result of the second and third year of at least 100 EC, including the BSc-thesis. Final admittance is granted after completing the BSc-programme.

### 1.4.2 Bachelor degree Marine Technology 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. A number of additional courses, of the second year of the Marine Technology BSc-programme has to be 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.

- The TH- and HZS-student can attend courses and tests of the chosen specialisation, while following the additional programme.
- The TH- and HZS-student is exempted from the internship (15 EC), keeping in mind the earlier study programme.
- The HZS-student is exempted from the 6 EC society oriented courses.
- In consult with the coordinator of the specialisation, a number of courses will be included in the programme to comply with the BSc- and MSc- level of the specialisation.
- The entire study programme for the TH-student amounts to  $28,5 + 120 - 15 = 133,5$  EC.
- The entire study programme for the HZS-student amounts to  $43,5 + 120 - 21 = 142,5$  EC.

TH/HZS admission coordinator is ir. Jaap van der Zanden.  
Secretary of the Board of Examiners is Ewoud van Luik.



Allseas Trenchsetter



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

Vakcode	Vaknaam	Docent	EC	1A	1B	2A	2B	Herk	TV	BEO
<b>VOOR TH- EN HZS-STUDENTEN</b>										
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
<b>Totaal TH (HZS)</b>			<b>28,5 (25,5)</b>	<b>6</b>	<b>9 (6)</b>	<b>12</b>	<b>1,5</b>			
<b>AANVULLING VOOR HZS-STUDENTEN</b>										
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
<b>Totaal HZS</b>			<b>43,5</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>5</b>			

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 deelcijfer; 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 daaronder vallende vakken is  $\geq 6,0$ . weegfactor 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 is to be approved by the lecturer of the chosen specialization. This list should be submitted to the examination committee by means of 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.

Course schedules can be found in appendix 6.6.

### Variants and specializations

The MSc-programme is available in 2 different variants and 7 specializations:

- 1 Science (Variant)
  - 1.1 Ship Hydromechanics
  - 1.2 Ship and Offshore Construction
  
- 2 Design, Production and Operation (Variant)
  - 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 2 annotations, which can be done as a supplement to the variant programme:

- a Technical Marketing
- b Sustainable Development



Barend Biesheuvel, Damen Shipyards Group

### 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 MSc-thesis may cover both areas.

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 Science

Course code	Course name	Lecture hours	EC
mt514	Ship Motions and Manoeuvring 3	0/0/0/4	3
mt523	Numerical Methods for MT	0/4/0/0	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
<b>Total</b>			<b>20</b>

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, after consultation with the head of the department.

The final year MSc-thesis 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 27 83598	j.a.pinkster@wbmt.tudelft.nl
	prof. dr. ir. T. van Terwisga	+31 15 27 86860	t.vanterwisga@wbmt.tudelft.nl
	dr. ir. J.A. Keuning	+31 15 27 81897	j.a.keuning@wbmt.tudelft.nl
<b>Secretary</b>	P.W. de Heer	+31 15 27 86873	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 programme.

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 programme:

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).
- MSc-thesis 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 MSc-theses:

- 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
mt044	Naval Ship Design	0/0/0/2	2
mt218	Mechatronics in Marine Technology	0/0/4/0	5
mt411	Offshore Technology	4/0/0/0	3
mt525	Marine Propulsion systems	0/0/0/2	2
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

	prof. dr. ir. J.A. Pinkster	+31 15 27 83598	j.a.pinkster@wbmt.tudelft.nl
	ir. G. Hommel	+31 15 27 86507	g.hommel@wbmt.tudelft.nl
<b>Secretary</b>	P.W. de Heer	+31 15 27 86873	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. MARIN, 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 behaviour 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, 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 MSc-theses are:

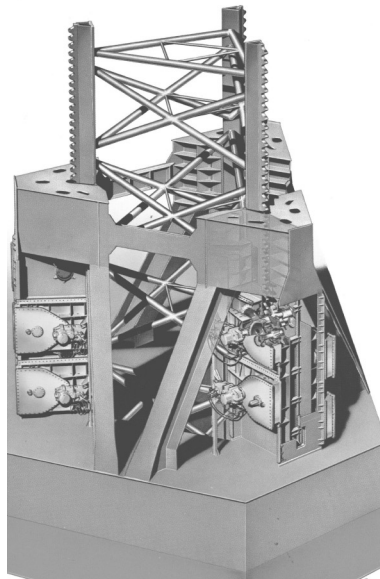
- Numerical simulation of the impact strength of a Y-shaped shell structure during collision.
- Optimization of structural configurations for superstructures of mega-yachts.
- Research into the strength aspects of application of composites for sailing yachts.

- 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.

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 MSc-thesis 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



Hydraulic rack and pinion elevating system, IHC Gusto Engineering

## 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
mt044	Naval Ship Design	0/0/0/2	2
mt212	Marine Engineering B	2/0/0/0	3
mt213	Marine Engineering C	0/2/0/0	2
mt218	Mechatronics in Marine Technology	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
mt525	Marine Propulsion systems	0/0/0/2	2
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
- Ship Production
- 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 Design, Production and operation

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
mt729	Maritime Business Game	0/0/0/4	3
wm0732mt	Maritime Law	4/0/0/0	3
<b>Total</b>			<b>22</b>



### 1.5.2.1 Specialisation Marine Engineering

	Prof. ir. J. Klein Woud	+31 15 27 81556	j.kleinwoud@wbmt.tudelft.nl
	Ir. ing. H.T. Grimmelijs	+31 15 27 82746	h.t.grimmelijs@wbmt.tudelft.nl
<b>Secretary</b>	Ing. O. van Lent	+31 15 27 86564	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 MSc-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 MSc-thesis) abroad.

**MSc-thesis** The MSc-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 MSc-thesis may have a practical as well as a more fundamental theoretical nature.

Examples of recent MSc-theses 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
mt044	Naval Ship Design	0/0/0/2	2
mt525	Marine Propulsion systems	0/0/0/2	2
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

### 1.5.2.2 Specialisation Ship Production

	Prof. dr. ir. U. Nienhuis	+31 15 27 85306	u.nienhuis@wbmt.tudelft.nl
	Ir. C. Dirkse	+31 15 27 84057	c.dirkse@wbmt.tudelft.nl
<b>Secretary</b>	Mrs. A. Nieuwland-Jobse	+31 15 27 83882	a.nieuwland@wbmt.tudelft.nl

Ship Production 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 Ship Production, 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.

Ship Production 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 Ship Production 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 "Ship Production" 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 Ship Production sector is the prime partner in the research and education, the horizon of the section stretches across Europe into the global market of Ship Production. 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.

Ship Production 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 Production

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 Production

Course code	Course name	Lecture hours	EC
mt044	Naval Ship Design	0/0/0/2	2
mt525	Marine Propulsion systems	0/0/0/2	2
mt724	Ship finance	0/0/2/0	2
mt725	Inland shipping	0/2/0/0	2
mt726	Project planning and management	0/4/0/0	4
mt727	Shipyards process simulation and strategy	0/0/2/0	4
	Labour and organisational psychology *		
	Transport, routing and scheduling		
	Logistics		
	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 27 81732	a.aalbers@wbmt.tudelft.nl
	Ir. H. Boonstra	+31 15 27 81521	h.boonstra@wbmt.tudelft.nl
<b>Secretary</b>	Ing. O. van Lent	+31 15 27 86564	o.vanlent@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 MSc-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 MSc-theses 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
mt044	Naval Ship Design	0/0/0/2	2
mt213	Marine engineering C	0/2/0/0	2
mt525	Marine Propulsion systems	0/0/0/2	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

	Prof. dr. E. van de Voorde	+32 32204157	eddy.vandevoorde@ua.ac.be
	Ir. J. Frouws	+31 15 2786606	j.frouws@wbmt.tudelft.nl
<b>Secretary</b>	Ing. O. van Lent	+31 15 27 86564	o.vanlent@wbmt.tudelft.nl

The specialisation is a joint activity of DUT 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	0/0/4/0	3
wb3420-03	Logistics: introduction	2/2/0/0	3

#### Recommended elective courses specialisation Shipping Management

Course code	Course name	Lecture hours	EC
mt044	Naval Ship Design	0/0/0/2	2
mt112	Ship design 3	4/0/0/0	3
mt113	Ship design 4	0/4/0/0	3
mt525	Marine Propulsion systems	0/0/0/2	2
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

	Prof.ir. A. Aalbers	+31 15 27 81732	a.aalbers@wbmt.tudelft.nl
	Ir. H. Boonstra	+31 15 2781521	h.boonstra@wbmt.tudelft.nl
<b>Secretary</b>	Ing. O. van Lent	+31 15 27 86564	o.vanlent@wbmt.tudelft.nl

This specialisation is part of the section Ship Design. 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 a MSc-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
ot4661	Offshore moorings	0/0/4/0	3

#### Recommended elective courses specialisation Offshore Units Design

Course code	Course name	Lecture hours	EC
mt044	Naval Ship Design	0/0/0/2	2
mt213	Maritime engineering C	0/2/0/0	2
mt525	Marine Propulsion systems	0/0/0/2	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 two 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 Sustainable Development

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

#### Annotation Technical Marketing

The responsible lecturer for Technical Marketing is prof. mr. dr. Sicco C.Santema (tel. +31 15 27 83076). The Technical Marketing guidance of students will be co-ordinated by dr. H.M.J.J. Snelders (tel. +31 15 27 83108).

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. Sicco S. Santema). The marketing component in the study programme consists of at least 15 EC marketing courses and 23 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 in 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.

#### 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
<b>Total</b>			<b>12</b>

#### Recommended elective courses annotation Technical Marketing (at least 3 EC)

Course code	Course name	Lecture hours	EC
wm0720	Business law A / Company law	0/0/4/0	3
wm0115	Conflict handling and negotiation	0/3/0/0	2
Other courses relevant for TM			

### Annotation Sustainable Development

Sustainable Development (SD) is a growing concern in many research projects and is becoming a more essential element of political and organisational decision making. Nowadays technology plays an important role in the approaches to sustainability related problems. For this reason the Delft University of Technology offers students the possibility to specialise in SD.

The annotation tackles both the broad and in-depth knowledge regarding SD and technology. Sufficient in-depth knowledge is realized with the MSc-thesis, which has to incorporate SD issues. Students make SD a central element in the thesis focussed on their own disciplines. Every faculty has a SD lecturer, with specific expertise to assess the thesis.

The broad knowledge is guaranteed through the colloquium 'Technology in Sustainable Development' (wm0922tu, 4 EC) and a number of elective courses in the field of SD (at least 11 EC).

(Based on flyer 'What's your contribution to a sustainable world?')

Further information on the available courses and the possibilities can be found 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](mailto: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](mailto: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 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, 1<sup>st</sup>) and one is located at Education support staff (8B, 2<sup>th</sup>).

## 1.7 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 or the website.

**'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 9.
- Not more than 3 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.

## 1.8 Honours Track

During the course year 2004-2005 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.

## 1.9 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.

If you got a clear idea about where you want to go to, you can ask the Coordinator for International Exchange Marine Technology for advice 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 an 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 on both study and internship abroad is available at the TUDelft website (<http://www.tudelft.nl>); via Campus Portal choose under the heading STUDENT AFFAIRS: 'Internship, study, jobs'.



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](mailto:d.nijveldt@wbmt.tudelft.nl)



Internship, Santiago de Cuba 2003



## 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 Group, 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 Biomedical Engineering (BME), Materials Science and Engineering (MSE), Mechanical Engineering (ME), Marine Technology (MT) and Systems and Control (SC). The faculty also participates in the interfaculty MSc programmes Offshore Engineering (OE) and Transport, Infrastructure and Logistics (TIL).



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. drs. M. Waas, room: 8F-1-14, phone: 015 27 85401, email: [m.waas@wbmt.tudelft.nl](mailto:m.waas@wbmt.tudelft.nl)

### 2.2 Education support staff

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

prof.ir. Hans Klein Woud	Director of Education	<a href="mailto:j.kleinwoud@wbmt.tudelft.nl">j.kleinwoud@wbmt.tudelft.nl</a>	Tel. 015 27 81556
ir. Nic-Jan van Bommel	Manager Educational Programmes	<a href="mailto:n.j.vanbommel@wbmt.tudelft.nl">n.j.vanbommel@wbmt.tudelft.nl</a>	Tel. 015 27 88791
Fatma Çınar	Education Administration office	<a href="mailto:f.s.cinar@wbmt.tudelft.nl">f.s.cinar@wbmt.tudelft.nl</a>	Tel. 015 27 86753
Teuni Eden	Student adviser	<a href="mailto:t.eden@wbmt.tudelft.nl">t.eden@wbmt.tudelft.nl</a>	Tel.015 278 2176
Lies Gesink	Education Administration office	<a href="mailto:e.g.gesink@wbmt.tudelft.nl">e.g.gesink@wbmt.tudelft.nl</a>	Tel. 015 27 86591
Louise Karreman	Study Administration office	<a href="mailto:l.m.karreman@wbmt.tudelft.nl">l.m.karreman@wbmt.tudelft.nl</a>	Tel. 015 27 83457
Ewoud van Luik	Manager Education Administration office & webmaster	<a href="mailto:e.p.vanluik@wbmt.tudelft.nl">e.p.vanluik@wbmt.tudelft.nl</a>	Tel. 015 27 85734
dr. ir. Dick Nijveldt	Educational Adviser & Coordinator international exchange	<a href="mailto:d.nijveldt@wbmt.tudelft.nl">d.nijveldt@wbmt.tudelft.nl</a>	Tel. 015 27 85921
Carel Piguillet	Software Support	<a href="mailto:c.f.f.piguillet@wbmt.tudelft.nl">c.f.f.piguillet@wbmt.tudelft.nl</a>	Tel. 015 27 86820
Mascha Toppenberg	International MSc-coordinator	<a href="mailto:m.p.i.toppenberg@wbmt.tudelft.nl">m.p.i.toppenberg@wbmt.tudelft.nl</a>	Tel. 015 27 86959
ir. Jaap v.d. Zanden	Student adviser	<a href="mailto:j.vanderzanden@wbmt.tudelft.nl">j.vanderzanden@wbmt.tudelft.nl</a>	Tel. 015 27 82996

Education Support Staff  
 Mekelweg 2, 2628 CD Delft  
 Location 8B, 2<sup>th</sup> 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** Mrs. F.S. Çınar  
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 "William Froude"

"Het Scheepsbouwkundig Gezelschap 'William Froude'" is the student association for the students Maritime technology. It is an association run by students, for the students. "Froude" takes the interests of the students to heart and organises a wide variety of fun and useful activities for them.

### Social Activities

As a first year student you are confronted with the activities "Froude" has to offer from the start. The year traditionally starts with the first years-weekend. This is the opportunity to get acquainted with your fellow students and the study you are about to start with. A few weeks into the year Froude supplies you with two higher year students (your 'study parents') who will help you with your study in any way they can. To increase the bond between students of all years, a maritime café is organised once a month and held in the Lagerhuysch, our own bar which is situated beneath the faculty. Furthermore, one of the large yearly activities is the May Party which, along with a football tournament and a barbeque which always take place earlier that day, attracts a lot of students from all over Delft.



Study tour Sweden 2003

### Education

One of the foremost tasks that Froude embodies is quality control of education. In the communication between students and teachers, Froude plays a crucial role. An example of the part they play in this are "college responsies groepen" which are groups made up of a few students from each year. They supply us with crucial information about what is wrong with the classes, exams, etc. In the daily conversations with the members, information is also passed over. In this way Froude can act as spokesperson for its members and the students have an influence on education and changes in the curriculum. Furthermore Froude helps in organising promotional activities voor the study Maritime Technology like stands on the HISWA in the RAI, a huge maritime event.

### Study-related activities

Apart from being the link between students and teachers, William Froude is also the link between students and the business life. Lectures and symposia are organised to keep



up to date on the current events in the maritime industry. With help from the network of its old members, Froude also organises many excursions and workshops at companies in Holland and abroad. Every year there are about ten afternoon excursions to maritime companies in Holland. As to the foreign excursions, one is organised every year which takes the students to a country within Europe for a week and one is organised every two years to a far-away destination like Korea or America. For this last excursion the students can earn their journey by working for three weeks at a maritime company, hereby putting their knowledge to use. Furthermore the costs for these excursions are kept extremely low by means of sponsors so that all maritime students can have the opportunity to get acquainted with the entire maritime world! These trips contribute to the insight of the students and are a not to be missed addition to the study.



Left: Party "Mei-feest" 2003 in 't Lagerhuysch, right: Marine Technology stand at Hiswa 2004

**Visit us** We have a room for the association in the hallway past the drawing room. In here the coffee is always ready and there is always somebody for a fun or interesting conversation. Everybody is always welcome to come ask us about different classe, to complain about exams or simply to spend some time over a nice cup of coffee. It is of great importance to us to hear what is going on in the faculty to give us something to work with. Apart from that we also enjoy the company and hope to see you here often.

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

**Other student associations ('Disputen')**

Besides William Froude, there is a number of of other student associations related to Marine technology:

- |                                     |  |
|-------------------------------------|--|
| - Delft Waterbike Technology (DWT)  | <a href="http://www.dwt.tudelft.nl">www.dwt.tudelft.nl</a>                   |
| - Delft Yachting Syndicate (DYS)    | <a href="http://www.froude.tudelft.nl/dys">www.froude.tudelft.nl/dys</a>     |
| - Dispuut Offshore Technology (DOT) | <a href="http://www.dot.tudelft.nl">www.dot.tudelft.nl</a>                   |
| - Scaphatus (sloepenroeien)         | <a href="http://www.scaphatus.tudelft.nl">www.scaphatus.tudelft.nl</a>       |
| - Vulcanus (werktuigkunde)          | <a href="http://www.ocp.tudelft.nl/vulcanus">www.ocp.tudelft.nl/vulcanus</a> |

## 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.

### **Individual help and advice**

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 Mechanical Engineering. 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.

### **Personal circumstances**

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.

### **Advice to Examination Committee, Professor, ...**

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.

### **Foreign Student Financial Support (FSFS)**

The Delft University of Technology provides financial assistance to foreign students in cases where their study suffers delay due to special circumstances like physical illness, physical or sensory disorder, mental problems, insufficient organisation of the educational programme by the faculty.



Mrs. Teunie Eden, student adviser for all students BSc-MSc WbMT, as well as counsellor in case of harassment (see down this page)

Specialisms: Exchange students, International MSc-students, social programme international students.

Mekelweg 2, 8B 2<sup>th</sup> floor, room 28B

Email: t.eden@wbmt.tudelft.nl

Phone: 015 27 82176



Ir. Jaap v.d. Zanden, student adviser for all students BSc-MSc WbMT.

Specialisms: Graduate students, polytechnic high school students, quality control, student mentors.

Mekelweg 2, 8B 2<sup>th</sup> floor, room 28A

Email: j.vanderzanden@wbmt.tudelft.nl

Phone: 015 27 82996

### 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

## 2.7 Working conditions, RSI and harassment

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
- Labour and environmental adviser Leen Paauw, l.paauw@wbmt.tudelft.nl
- 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>

### Harassment

Harassment is inappropriate, unwanted behaviour which disturbs someone. Teasing, mocking, gossiping, bullying, sexual or racial intimidation, violence and discrimination are all forms of harassment.

**Counsellor** If you have problems you can turn to the Counsellor as appointed by each department within the university. Counsellors operate under strictly confidential and trustworthy conditions and can offer advice, information, support and assistance to victims of harassment. When necessary they may enlist the assistance of mediators. They can also assist and guide you, should you wish to submit your complaint to the DUT Complaints Committee. All actions are subject to your permission and approval.

If you experience any problems do not hesitate! Everyone at TU Delft has a right to feel respected and safe!

The Counsellor for our department is:

Mrs. T.Eden

Mekelweg 2, 8B 2th floor, room 28B, email: [vertrouwenspersoon@wbmt.tudelft.nl](mailto:vertrouwenspersoon@wbmt.tudelft.nl)

Phone: 015 27 82176

## 2.8 Quality Control

The quality of the education 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 and 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.
- **Evaluation meetings** with students and lecturers.
- Complaints** - 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 direct feedback to lecturers.

External quality control:

- The study is being accredited every five years, by the NVAO (Nederlands Vlaamse Accreditatie Organisatie). In preparation of the accreditation, the study is evaluated by a visitation committee formed by QANU (Quality assurance Netherlands Universities)

## 2.9 Information services

- Study guide** This study guide is the main information source of the study programme and is available to all students at the education support desk (8B, 2<sup>th</sup>).  
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. Grades can also be found on blackboard.
- Grades** Information that is not related directly to the study e.g. information by students association 'William Froude', will be published on publication boards. Members of 'William Froude' will be kept informed by e-mail.

## 2.10 Rules and Regulations

### Student Statute (Studentenstatuut)

The Education Specific Part of the Student Statute (OSDS) applies to the education and the examinations 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).

### Faculty regulations

- It is not allowed to smoke within the faculty building.
- 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 <sup>st</sup> hour:	8.45	9.30
2 <sup>nd</sup> hour:	9.45	10.30
3 <sup>rd</sup> hour:	10.45	11.30
4 <sup>th</sup> hour:	11.45	12.30
5 <sup>th</sup> hour:	13.45	14.30
6 <sup>th</sup> hour:	14.45	15.30
7 <sup>th</sup> hour:	15.45	16.30
8 <sup>th</sup> 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 15<sup>th</sup> of July, the lockers should be empty and the keys should be returned. Lockers, still in use after the 15<sup>th</sup> of July, will be provided with 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 DUT and also serious misbehaviour will be mentioned to the proper authorities.

### **Internet facilities**

The utilisation of 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

In this study guide is being referred to locations, within the faculty building, by means of a number and a letter between brackets, which corresponds to the faculty map in appendix 6.7. The floor is also indicated (BG= ground floor, 1<sup>st</sup> = first floor, etc.). Locations outside the faculty can be found at the campus map, appendix 6.5.

#### 3.1 Lecture Rooms / Meeting Rooms

Lecture rooms are used for lectures, presentations and instructions. The next table summarises all lecture rooms, mentioning capacity and location.

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

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 <sup>st</sup>
K	30	8G, 1 <sup>st</sup>
L	30	8G, 1 <sup>st</sup>
P	<u>40</u>	4, BG



## 3.2 Individual study facilities

At several locations in the faculty individual study places are available. Some of these study places are equipped with computers. These places are free to use, without reservation. Places should be left clean and tidy.

Besides the study places as mentioned above, there are also places to study in the faculty library and the central library (see 3.5). 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 study places, computers are available in the computer rooms. All computers give access to the internet. The computer rooms are free to use by all students, if they are not 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. The next table shows all the computer rooms and their location.

Room	Location
Athena room	4, 1 <sup>st</sup>
Parthemus room	4, 1 <sup>st</sup>
Pallas room	4, 1 <sup>st</sup>
Design studios	8G, BG

### 3.4 Research facilities

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

#### Hydromechanics Laboratory

**Facilities** 140 m Towing tank  
85 m Towing tank  
Cavitation tunnel  
Workshop for ship models

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

The library of the TU Delft consists of a main building and smaller faculty libraries. The main building has a large collection of books and magazines. The main part of the collection can be lent from the library and has to be requested. 30 minutes after requesting the item will be available. The remaining part of the collection (open shelves) is only available within the library.

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 needs a library card, which pass can be acquired at the desk in the main building or at the faculty libraries.

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

		Lecture period	Exam period	Summer holiday
<b>Opening hours</b>	Mo - Thu	9:00 - 22:00	9:00 - 24:00	9:00 - 17:00
	Fri	9:00 - 18:00	9:00 - 22:00	9:00 - 17:00
	Sa and Su	10:00 - 18:00	10:00 - 22:00	Closed
<b>Book desk</b>	Mo - Thu	9:00 - 19:00	9:00 - 19:00	9:00 - 19:00
	Fri	9:00 - 17:00	9:00 - 17:00	9:00 - 17:00
	Sa	10:00 - 13:00	10:00 - 13:00	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. As a maximum, 20 items can be loaned. If a book is requested but not available, the requester will receive a notification by email or post if the book is available.

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, focussed on Mechanical Engineering and Marine Technology. Part of the books on Mechanical Engineering and Marine Technology, however 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 Adress Identification (recent bank statement, insurance policy, etc.). The library card is free from charge and for personal use only.

## 3.6 Lecture notes and books

Most lecture notes, which are used for lectures at the faculty, can be bought at the 'repro', as well as some books and office articles are available. Books are also available at student association 'Leeghwater' ([www.leeghwater.nl](http://www.leeghwater.nl)) and VSSD ([www.vssd.nl](http://www.vssd.nl)).

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

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

Location: 10, BG.

For courses at other faculties, lecture notes can be bought at the concerning faculties:

- Aerospace Engineering: 1st floor, 015 27 81250
- Applied Physics: room no. C 057, 015 27 87992
- Civil Engineering: 015 27 81727
- Management of Technology: ground floor, next to entrance, 015 27 86373
- Electrical Eng, Mathematics, Computer sc. (EWI): room 350, 015 27 87855

### 3.7 Mailbox and access to the internet

Each student has the possibility to access and communicate on the Internet. Therefore each student receives a faculty login account and an e-mail account. The email account is accessible everywhere, via a webmail server. At the faculty students can use printers, plotters, scanners, etc.

**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 6	Microsoft Frontpage XP
Adams 12	Microsoft Office XP
Ansys 6.1	Microsoft Visual Basic 6.0
Autocad Lite 2002	Netpresenter
Card	Paint Shop Pro 8
Cycle Tempo 5.0	Pro Engineer 2001
Flash	Qres
Fluent 6.012	Real One Player
Force 2.0 compiler	Shockwave
Gambit 2.04	Sophos Antivirus
GSP 9.111	TAS
Internet Explorer 6.0 SP1	TNT Lite 6.6
Maple 8	WBalance
Mathcad 5	Workspace
Mathtype 5	WS-FTP LE 5.08
Matlab 6.5	

### 3.9 Catering

The faculty offers a variety of catering facilities.

<b>Canteen</b>	The faculty canteen serves a comprehensive lunch. The canteen can be found at location 10, BG.
<b>Coffee corner</b>	The coffee corner is specialised in a quick snack. The coffee corner is situated near the main entrance (8F). Chairs, tables and couches are available. Opposite of the coffee corner there are dispensers for coffee, candy bars, sodas, soup, etc. Paying at these dispensers is only possible with the electronic chipcard 'chipknip'.
<b>Faculty room</b>	The faculty room is a place for giving symposia, meetings or graduation parties ("afstudeerborrels"). A reservation can be made at the desk of the education support staff.
<b>Lagerhuysch</b>	The Lagerhuysch is situated below ground level in section 8B, with access from the square in front of the faculty. The Lagerhuysch offers the possibility for celebrating graduation parties (afstudeerborrels), but also for organising symposia and meetings. The students associations Gezelschap Leeghwater and William Froude regularly organise activities. On the site <a href="http://www.lagerhuysch.tudelft.nl">http://www.lagerhuysch.tudelft.nl</a> a route description and a reservation form for the Lagerhuysch can be found.
<b>Auditorium</b>	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.





# Service for Students

## 4 DUT - Services for students

Delft University of Technology (DUT) provides several service centres for students:

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

For all other services: refer to the DUT 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 DUT
- 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 activities:

- Indoors, 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.

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, communicative, musical and dancing. 'Mekelweg 10' also supports cultural activities of student organisations and members of DUT staff.

The facilities are:

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

Cultural Centre '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 support 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

**In general courses are given in English, with some exceptions:**

- **E:** means that the course is given in english
- **NL:** means that the course is only given in Dutch
- **ER:** means that the course is given in Dutch, on request the course is given in English

**For complete course descriptions see website.**

<b>mt044</b>	<b>Naval Ship Design</b>	
<b>Lecturer</b>	Mr. R. Brouwer, MSc. (RNLN) and others	
<b>Course Material</b>	See website	
<b>Description</b>	The course "Naval Ship Design" (NSD) is given as a co-operation between the Technical University and the Royal Netherlands Navy (RNLN). During the lectures, miscellaneous aspects of warship design will be discussed. Some subjects are: warship operations, warship types, weaponsystems, Platformsystems, crew, hydrodynamics, vulnerability, signatures, nuclear biological chemical (NBC), fight and damage control (DC), structural design. Also a fleet visit in the navy harbour of the Netherlands (Den Helder) is part of the course.	
<b>Education</b>	Lecture 0/0/0/2	<b>EC 2</b>
<b>Assessment</b>	Presentation	<b>ER</b>
<b>mt112</b>	<b>Ship Design 3</b>	
<b>Lecturer</b>	Lagers, ir. G.H.G.	
<b>Course Material</b>	Hand outs at the lectures	
<b>Description</b>	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.	
<b>Education</b>	Lecture 2/0/0/0	<b>EC 3</b>
<b>Assessment</b>	Oral	<b>ER</b>
<b>mt113</b>	<b>Ship Design 4</b>	
<b>Lecturer</b>	Frouws, ir. J.W., Stapersma, prof.ir. D., Keuning, dr.ir. J.A.	
<b>Course Material</b>	J. Pinkster, "Introduction to Advanced Marine Vehicles", 1994, and copies of publications on relevant topics.	
<b>Description</b>	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	
<b>Education</b>	Lecture 0/4/0/0	<b>EC 3</b>
<b>Assessment</b>	Written	<b>ER</b>

<b>mt212</b>	<b>Marine Engineering B</b>		
<b>Lecturer</b>	Klein Woud, prof.ir. J.		
<b>Course Material</b>	J.Klein Woud, "Marine Engineering B", 2003.		
<b>Description</b>	flexible mounting of equipment, dynamics of shaft systems, torsional, axial and lateral vibrations (whirling), shaft alignment		
<b>Education</b>	Lecture 2/0/0/0	<b>EC</b>	3
<b>Assessment</b>	Oral		<b>NL</b>
<b>mt213</b>	<b>Marine Engineering C</b>		
<b>Lecturer</b>	Grimmelius, ir.ing. H.T.		
<b>Course Material</b>	Klein Woud, K.: "Maritieme Werktuigkunde IV", TU-Delft, 1999. Selected papers.		
<b>Description</b>	Maintenance concepts. Relation with Life Cycle Costs. Reliability. Availability. Event & Fault tree analysis. Condition Monitoring.		
<b>Education</b>	Lecture 0/2/0/0	<b>EC</b>	2
<b>Assessment</b>	Written		<b>ER</b>
<b>mt216</b>	<b>Internal Combustion Engines</b>		
<b>Lecturer</b>	Klein Woud, prof.ir. J.		
<b>Course Material</b>	Marine Engineering. Design of Propulsion and Electric Power Generation Systems. J. Klein Woud and D. Stapersma. , and some prints will be provided		
<b>Description</b>	Basic thermodynamic principles. Piston engines both diesel and otto engines. Gas turbines Fuel characteristics		
<b>Education</b>	Lecture 0/0/0/2	<b>EC</b>	3
<b>Assessment</b>	Written		<b>E</b>

<b>mt217</b>	<b>Design Methodology and Knowledge Engineering</b>		
<b>Lecturer</b>	Klein Woud, prof.ir. J., and others		
<b>Course Material</b>	overhead sheets on Blackboard		
<b>Description</b>	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.		
<b>Education</b>	Lecture 2/0/0/0	<b>EC</b>	4
<b>Assessment</b>	Written report		<b>ER</b>
<b>mt218</b>	<b>Mechatronics in MT</b>		
<b>Lecturer</b>	Grimmelius, ir.ing. H.T.		
<b>Course Material</b>	`Dynamic positioning of vessels at sea`; Pinkster `A Study on Weather Vaning Dynamic Positioning System`; Pinkster, Hagiwara, Shoji, Fukuda + additional material		
<b>Description</b>	Mechatronics, sensors and actuators, signal sampling, filtering, D/A-A/D conversion, hardware-in-the-loop control and simulation, weather vaning DP/DT system		
<b>Education</b>	Lecture 0/0/4/0	<b>EC</b>	5
<b>Assessment</b>	Written report		<b>ER</b>
<b>mt313</b>	<b>Shipping Management</b>		
<b>Lecturer</b>	Meersman, prof.dr. H., Voorde, prof.dr. E. van de (Universiteit Antwerpen, ITMMA)		
<b>Course Material</b>			
<b>Description</b>	During this course a subject is chosen in consult with the lecturers. The lecturers come up with a list of references / suggestions on the subject. The student writes a report on this subject to broaden his/her knowledge on that subject. The report is presented and defended in front of the other students. Regular hearings take place to solve problems.		
<b>Education</b>	Lecture 0/0/4/0	<b>EC</b>	3
<b>Assessment</b>	Written report + presentation		<b>ER</b>



<b>mt411</b>	<b>Offshore Technology</b>		
<b>Lecturer</b>	Boonstra, ir. H.		
<b>Course Material</b>	B. Boon and H. Boonstra, "Design of Maritime Offshore Constructions II" (in Dutch), 1991		
<b>Description</b>	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.		
<b>Education</b>	Lecture 4/0/0/0	<b>EC</b>	3
<b>Assessment</b>	Written		<b>ER</b>
<b>mt514</b>	<b>Ship Movements and Steering 3</b>		
<b>Lecturer</b>	Pinkster, prof.dr.ir. J.A.		
<b>Course Material</b>	Scheepsbewegingen, sturen en manoeuvreren 2: Prof. J. Gerritsma Wave drift forces: Prof.dr.ir. J.A. Pinkster		
<b>Description</b>	Manoeuvring and Steering. Theory after these subjects. Linear models, non-linear models. Model tests to support and assess mathematical models. Stopping and accelerating of ships. Influence of small waterdepth and breadth of waterway, mutual influence of ships. Simulators. Ship movement. 3-dimensional diffraction theory. Strip theory. Behaviour of moored offshore constructions. Non-linear wave drift forces.		
<b>Education</b>	Lecture 0/0/0/4	<b>EC</b>	3
<b>Assessment</b>	Written		<b>ER</b>
<b>mt515</b>	<b>Propulsion and Resistance 3</b>		
<b>Lecturer</b>	Terwisga, prof.dr.ir. T. van		
<b>Course Material</b>	Course notes, distributed during classes		
<b>Description</b>	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		
<b>Education</b>	Lecture 2/2/0/0	<b>EC</b>	3
<b>Assessment</b>	Presentation		<b>ER</b>

<b>mt523</b>	<b>Numerical Methods for MT</b>		
<b>Lecturer</b>	Koning Gans, dr.ir. H.J. de, Bosman, ir. T.N.		
<b>Course Material</b>	Koning Gans, Dr. Ir. H.J. de "Numerical Methods in Ship Hydromechanics"		
<b>Description</b>	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		
<b>Education</b>	Lecture 0/4/0/0	Computer exercises	<b>EC 4</b>
<b>Assessment</b>	Presentation		<b>ER</b>
<b>mt524</b>	<b>Hydromechanics of Special Ships</b>		
<b>Lecturer</b>	Keuning, dr.ir. J.A.		
<b>Course Material</b>	WEGEMT Courses on Advanced marine Vehicles, Sailing Yacht Design and Course notes, distributed during classes		
<b>Description</b>	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		
<b>Education</b>	Lecture 0/0/2/0		<b>EC 3</b>
<b>Assessment</b>	Presentation		<b>ER</b>
<b>mt525</b>	<b>Marine Propulsion systems</b>		
<b>Lecturer</b>	Beek, ir. T. van		
<b>Course Material</b>	Reader		
<b>Description</b>	This course describes the main properties of marine propulsions systems. After the course students have to be able to select a suitable propulsion system, define the main criteria, evaluate interfaces and dynamic behaviour. A rough cost review will be included.		
<b>Education</b>	Lecture 0/0/0/2		<b>EC 2</b>
<b>Assessment</b>	Written exam		<b>E</b>

<b>mt724</b>	<b>Ship Finance</b>		
<b>Lecturer</b>	Nienhuis, prof.dr.ir. U. MBA		
<b>Course Material</b>	Sources as accountants and banks: KPMG, Moret, Ernst & Young, NIB, etc. Shipping desks. Research institutes.		
<b>Description</b>	Costprice, exploitation, budgetting, marketing, costs and tariffs, rentability, finance, courses of exchange, internal and external companyfactors for shipowners and yards.		
<b>Education</b>	Lecture 0/0/4/0	<b>EC</b>	3
<b>Assessment</b>	Essay, presentation, abstracts of presentations, written exam		<b>NL</b>
<b>mt725</b>	<b>Inland Navigation</b>		
<b>Lecturer</b>	Dirkse, ir. C.		
<b>Course Material</b>	S.Hengst, "Binnenvaart in beeld" (in Dutch) Delft University Press		
<b>Description</b>	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		
<b>Education</b>	Lecture 0/2/0/0	Case study	<b>EC</b> 2
<b>Assessment</b>	Written report + presentation		<b>NL</b>
<b>mt726</b>	<b>Projectmanagement in shipbuilding and offshore</b>		
<b>Lecturer</b>	Nienhuis, prof.dr.ir. U. MBA		
<b>Course Material</b>	See website		
<b>Description</b>	Project management basics, project management scope, goal and result definition, five PM control aspects, planning, critical path, work-breakdown.structure, organisational structure, information flows, quality, cost calculation, project risk analysis, decision making, leadership styles, negotiation, contract terms and basics, culture, team composition, proposal preparation.		
<b>Education</b>	<u>Lecture</u> 0/3/0/0	<b>EC</b>	4
<b>Assessment</b>	Report + presentation + participation + written exam		<b>ER</b>

<b>mt727</b>	<b>Shipyard process simulation and strategy</b>		
<b>Lecturer</b>	Nienhuis, prof.dr.ir. U. MBA		
<b>Course Material</b>	See website		
<b>Description</b>	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.		
<b>Education</b>	Lecture 0/0/2-4/0	<b>EC</b>	<b>4</b>
<b>Assessment</b>	Report + presentation + participation		<b>ER</b>
<b>mt728</b>	<b>Ship repair and salvage</b>		
<b>Lecturer</b>	Dirkse, ir. C.		
<b>Course Material</b>	To be supplied by the company involved		
<b>Description</b>	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.		
<b>Education</b>	Lecture 0/0/2/0	<b>EC</b>	<b>3</b>
<b>Assessment</b>	Written report		<b>ER</b>
<b>mt729</b>	<b>Maritime Business Game</b>		
<b>Lecturer</b>	Nienhuis, prof.dr.ir. U. MBA		
<b>Course Material</b>	To be supplied during the course		
<b>Description</b>	Strategy, investment decisions, marketing, make or buy decisions, product mix decisions, financial reporting. Characteristics of one-of production, internal and external process parameters, market parameters, business processes, international factor differences (labour, capital, material, productivity, etc), fiscal systems, subsidies, protection, exchange rates, interest rates. Maritime value chain, shipping, shipbuilding, maritime suppliers, banks		
<b>Education</b>	Group work 0/0/0/x	<b>EC</b>	<b>3</b>
<b>Assessment</b>	Report + presentation		<b>ER</b>

<b>mt814</b>	<b>Vibration and noise in ships</b>		
<b>Lecturer</b>	Hylarides, prof.dr.ir. S.		
<b>Course Material</b>	Lecture notes		
<b>Description</b>	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.		
<b>Education</b>	Lecture 0/0/0/4	<b>EC</b>	3
<b>Assessment</b>	Written		<b>ER</b>
<b>mt815</b>	<b>Ship Construction and Strength: Special Subjects</b>		
<b>Lecturer</b>	Vink, ir. J.H., Hommel, ir. G.		
<b>Course Material</b>	As made available by the relevant experts.		
<b>Description</b>	<p>Three advanced topics in the field of ship and offshore structures will be dealt with each year.</p> <ul style="list-style-type: none"> <li>- Each odd week, a topic is introduced by an expert during a lecture of 3 hrs.</li> <li>- Subsequently, the students have to work in groups on a task as defined by the expert.</li> <li>- The results of the task are presented and discussed in the next even week.</li> </ul>		
<b>Education</b>	Lecture 0/0/3/0	Presence obligatory	<b>EC</b> 2
<b>Assessment</b>	Participation + presentation		<b>ER</b>
<b>mt816</b>	<b>Composite materials for ship construction</b>		
<b>Lecturer</b>	Leenders, ir. W.S.		
<b>Course Material</b>	Summaries; course-book in preparation.		
<b>Description</b>	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.		
<b>Education</b>	Course week 0/0/0/x	<b>EC</b>	2
<b>Assessment</b>	Case		<b>ER</b>

<b>mt830</b>	<b>Applications of the Finite Element Method</b>		
<b>Lecturer</b>	Hommel, ir. G.		
<b>Course Material</b>	Finite Element Modeling for Stress Analysis, Cook,R.D., ISBN 0-471-10774-3		
<b>Description</b>	application and user aspects, modeling procedures, advanced elements, elastic kernel, errors and accuracy, recent developments, commercial software		
<b>Education</b>	Lecture 0/0/0/4	<b>EC</b>	<b>3</b>
<b>Assessment</b>	Written		<b>ER</b>
<b>mt835</b>	<b>Hydro Structural Subjects</b>		
<b>Lecturer</b>	Vink, ir. J.H., Journee, ir. J.M.J.		
<b>Course Material</b>	Hand outs will be available for each subject		
<b>Description</b>	Superposition of global and local responses, Internal tank pressures, External pressures, Splash zone, Intermitted wetting, Long term distribution of stresses, Fatigue damage, Hydroelasticity		
<b>Education</b>	Lecture 0/0/4/0	<b>EC</b>	<b>3</b>
<b>Assessment</b>	Written report		<b>ER</b>
<b>mt836</b>	<b>Advanced Programming</b>		
<b>Lecturer</b>	Hommel, ir. G.		
<b>Course Material</b>	See website		
<b>Description</b>	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.		
<b>Education</b>	Lecture 0/0/2/2	<b>EC</b>	<b>3</b>
<b>Assessment</b>			<b>ER</b>







# 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"> <li>- writing a thesis;</li> <li>- writing a paper/completing an assignment, project or technological design;</li> <li>- completing a design or research assignment;</li> <li>- conducting literature study;</li> <li>- completing a work placement;</li> <li>- taking part in fieldwork or an excursion;</li> <li>- conducting tests and experiments;</li> <li>- or participating in another educational activity focused on the attainment of a particular skill.</li> </ul> |
| 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 and tests that are part of the study programme 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. 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. 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.
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.
4. 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.
5. 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.

#### 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 2004.



## 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 two 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
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 june 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 examiner 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 CER<sup>1</sup>, 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;
- d that clemency should be shown in all cases in which students' progress is slowed by circumstances beyond their control.

<sup>1</sup> Course and Examination Regulations

## 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. At the beginning of the course it should be clear what study material (books, lecture notes) will be used during the course.
- 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. It should also be clear how many credits a question or assignment contributes to the total score of the examination.
- 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 RESULTS<sup>2</sup>

- 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:

<sup>2</sup> 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.

- 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;
  - b the candidate concerned shall have completed the Master's degree programme in no more than three years;
  - c the mark awarded for the thesis project shall be no less than 9;
  - 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.
- 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 APPROVAL

- 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 2004.

Approved by the board of examiners of the Master's programme in Marine Technology.



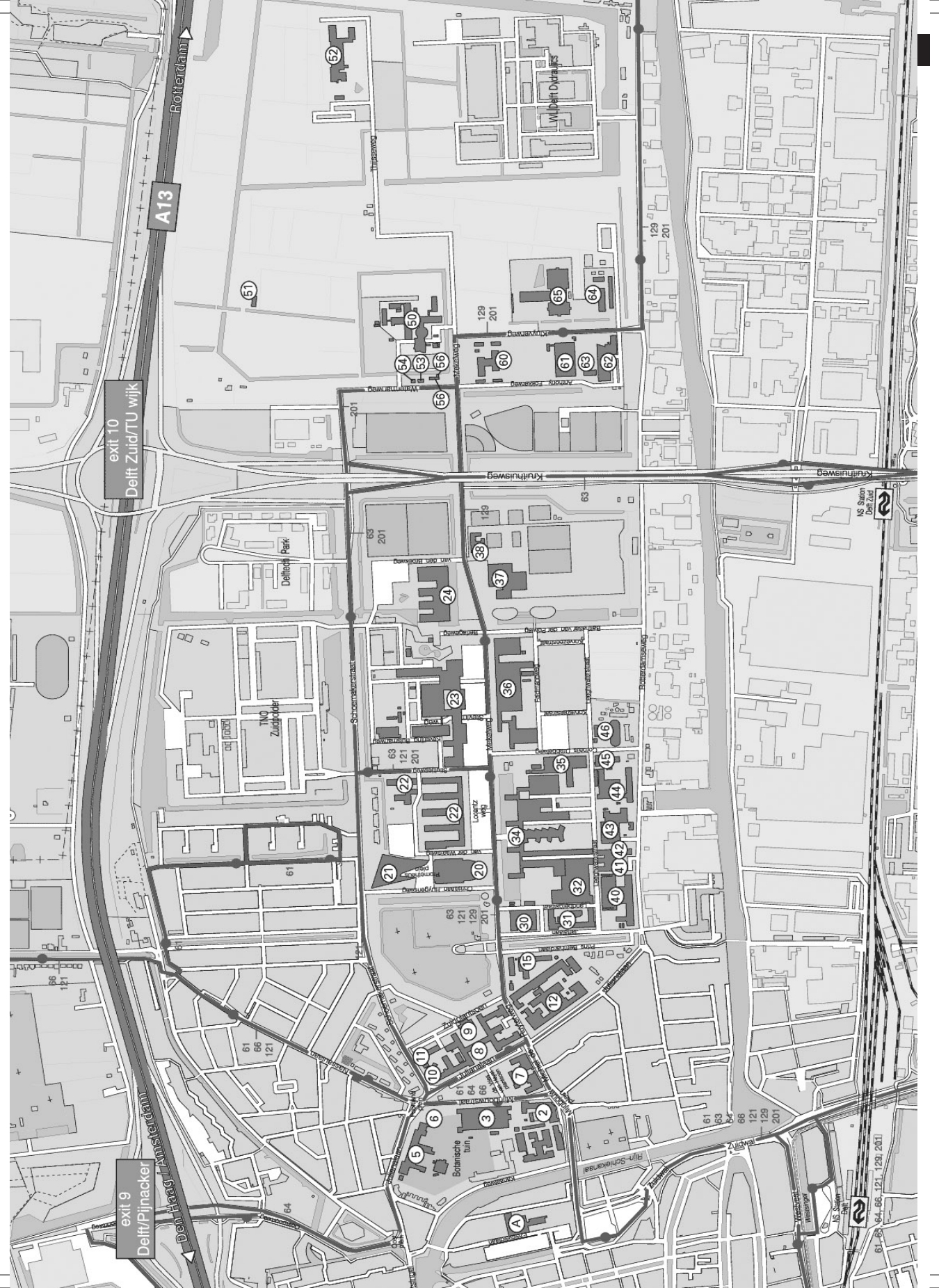
## 6.4 Lecturers

Naam	Tel <sup>1</sup>	E-Mail	Kamer	Gebouw <sup>2</sup>
Aalbers, prof.ir. A.	81732	a.aalbers@wbmt.tudelft.nl	7-1-113	WbMT
Bles, ir. A.A. van der	89296	a.a.vanderbles@wbmt.tudelft.nl	7-1-139	WbMT
Bom, ing. C.J.	86870	c.j.bom@wbmt.tudelft.nl	7-1-126	WbMT
Boonstra, ir. H.	81521	h.boonstra@wbmt.tudelft.nl	7-1-117	WbMT
Dijkstra, dr. S.	85606	s.dijkstra@wbmt.tudelft.nl	8C-0-01	WbMT
Dirkse, ir. C.	84057	c.dirkse@wbmt.tudelft.nl	7-1-107	WbMT
Drooger, J.C.	82700	j.c.drooger@wbmt.tudelft.nl	7-1-103	WbMT
Frouws, ir. J.W.	86606	j.w.frouws@wbmt.tudelft.nl	7-1-118	WbMT
Grimmelius, ir. ing. H.T.	82746	h.t.grimmelius@wbmt.tudelft.nl	7-1-119	WbMT
Hommel, ir. G.	86507	g.hommel@wbmt.tudelft.nl	7-1-137	WbMT
Keimpema, H. van	81040	h.vankeimpema@wbmt.tudelft.nl	7-1-109	WbMT
Keuning, dr. ir. J.A	81897	j.a.keuning@wbmt.tudelft.nl	7-0-114	WbMT
Klein Woud, prof. ir. J.	81556	j.kleinwoud@wbmt.tudelft.nl	7-1-121	WbMT
Koning Gans, dr.ir. H.J. de	81852	h.j.dekoninggans@wbmt.tudelft.nl	7-1-131	WbMT
Journee, ir. J.M.J.	83881	j.m.j.journee@wbmt.tudelft.nl	7-1-128	WbMT
Lagers, ir. G.H.G.	81732	g.h.g.lagers@wbmt.tudelft.nl	7-1-113	WbMT
Leenders, ir. W.S.	85524	w.s.leenders@wbmt.tudelft.nl	7-1-135	WbMT
Meersman, prof. dr. H.	84682	h.meersman@wbmt.tudelft.nl	7-1-122	WbMT
Nienhuis, prof. dr. ir. U. MBA	85306	u.nienhuis@wbmt.tudelft.nl	7-1-106	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	7-1-105	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)

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

<sup>2</sup> 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



A13

exit 10  
Delft Zuid/TU wijk

exit 9  
Delft/Pinacker

Rotterdam

Den Haag/Amsterdam

52

51

54

53

56

55

50

60

61

63

62

129

201

65

64

129

201

Kritikusweg

NS Station  
Delft Zuid

Delftboer Park

TNO  
Zuidoost

24

37

38

63

201

36

23

35

45

46

45

44

43

42

41

40

32

31

30

21

22

22

63

121

201

21

20

34

34

15

12

11

10

9

8

7

6

5

4

3

2

1

61

66

121

64

56

63

129

201

61

63

66

121

129

201

NS Station  
Delft

## 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 MSC MARINE TECHNOLOGY 2004-2005

		SEMESTER 1A (WEEK 37-43)				SEMESTER 1B (WEEK 46-52)				SEMESTER 2A (WEEK 6-12)				SEMESTER 2B (WEEK 15-22) week 18 holiday			
Day	hour	Course name	Lecturer	Code	Room	Course name	Lecturer	Code	Room	Course name	Lecturer	Code	Room	Course name	Lecturer	Code	Room
	1																
	2																
	3	Ship design 3 1)	Boonstra	mt112	34L	Ship design 4	Frouws e.a.	mt113	34K	Shipyard processes	Nienhuis	mt727					
MO	4	Ship design 3 1)	Boonstra	mt112	34L	Ship design 4	Frouws e.a.	mt113	34K	Shipyard processes	Nienhuis	mt727					
	5	Ship design 3 1)	Boonstra	mt112	34L	Numerical methods for MT	Koning G./Bosman	mt523	34K	Hydro structural subjects	Vink/Journee	mt835					
	6	Ship design 3 1)	Boonstra	mt112	34L	Numerical methods for MT	Koning G./Bosman	mt523	34K	Hydro structural subjects	Vink/Journee	mt835					
	7																
	8																
	1													Advanced programming	Hommel	mt836	
	2													Advanced programming	Hommel	mt836	
	3	Law for MT	Wijting e.a.	wm0732mt	34J					Hydromech.spec.shiptypes	Keuning	mt524					
	4	Law for MT	Wijting e.a.	wm0732mt	34J					Hydromech.spec.shiptypes	Keuning	mt524					
	5	Offshore technology	Lagers	mt411	46A					Mechatronics in MT	Grimmelius	mt218		Ship motions & control 3	Pinkster JA	mt514	
TU	6	Offshore technology	Lagers	mt411	46A					Mechatronics in MT	Grimmelius	mt218		Ship motions & control 3	Pinkster JA	mt514	
	7													Internal combustion engines	Klein Woud	mt216	
	8													Internal combustion engines	Klein Woud	mt216	
	1	Marine engineering B	Klein Woud	mt212	34L									Composit materials	Leenders	mt816	
	2	Marine engineering B	Klein Woud	mt212	34L									Composit materials	Leenders	mt816	
	3	Resistance propulsion 3	Terwisga v.	mt515	34E	Resistance propulsion 3	Terwisga v.	mt515	34E	Shipping management	Vandevoorde	mt313					
WE	4	Resistance propulsion 3	Terwisga v.	mt515	34E	Resistance propulsion 3	Terwisga v.	mt515	34E	Shipping management	Vandevoorde	mt313					
	5					Project management	Nienhuis	mt726	34E	Ship finance	Nienhuis	mt724		Ship motions & control 3	Pinkster JA	mt514	
	6	Design meth.& knowl.eng.	Klein Woud	mt217	34E	Project management	Nienhuis	mt726	34E	Ship finance	Nienhuis	mt724		Ship motions & control 3	Pinkster JA	mt514	
	7	Design meth.& knowl.eng.	Klein Woud	mt217	34E	Project management	Nienhuis	mt726	34E	Ship finance	Nienhuis	mt724		Vibration noise ships	Hyarides	mt814	
	8					Project management	Nienhuis	mt726	34E	Ship finance	Nienhuis	mt724		Vibration noise ships	Hyarides	mt814	
	1	Law for MT	Wijting e.a.	wm0732mt	34F	Numerical methods for MT	Koning G./Bosman	mt523	34K								
	2	Law for MT	Wijting e.a.	wm0732mt	34F	Numerical methods for MT	Koning G./Bosman	mt523	34K								
	3					Ship design 4	Frouws e.a.	mt113	34K								
	4					Ship design 4	Frouws e.a.	mt113	34K								
	5	Offshore technology	Lagers	mt411	34K	Inland shipping	Dirkse	mt725	34E					Marine propulsion systems	Van	mt525	
TH	6	Offshore technology	Lagers	mt411	34K	Inland shipping	Dirkse	mt725	34E	Constr.strength s.s	Vink/Hommel	mt815		Marine propulsion systems	Terwisga	mt525	
	7									Constr.strength s.s	Vink/Hommel	mt815		Marine propulsion systems	Van	mt525	
	8									Constr.strength s.s	Vink/Hommel	mt815		Marine propulsion systems	Terwisga	mt525	
	1					Application of FEM	Hommel	mt830	34K								
	2					Application of FEM	Hommel	mt830	34K	Mechatronics in MT	Grimmelius	mt218					
	3					Marine engineering C	Grimmelius	mt213	34K	Mechatronics in MT	Grimmelius	mt218					
	4					Marine engineering C	Grimmelius	mt213	34K	Ship repair, salvage	Dirkse	mt728					
FR	5					Marine engineering C	Grimmelius	mt213	34K	Ship repair, salvage	Dirkse	mt728					
	6									Hydro structural subjects	Vink/Journee	mt835		Vibration noise ships	Hyarides	mt814	
	7									Hydro structural subjects	Vink/Journee	mt835		Vibration noise ships	Hyarides	mt814	
	8									Hydro structural subjects	Vink/Journee	mt835		Vibration noise ships	Hyarides	mt814	

1) Only in the weeks 37 - 40

Changes in course schedules may occur, see website.

**COLLEGEROOSTER AANVULLEND VAKKENPAKKET TH/HZS MT**

Dag	uur	SEMESTER 1A			SEMESTER 1B			SEMESTER 2A			SEMESTER 2B							
		Vak	Docent	Code	Zaal	Vak	Docent	Code	Zaal	Vak	Docent	Code	Zaal	Vak	Docent	Code	Zaal	
<b>MA</b>	1																	
	2	Analyse 1 TH	Tholen	wi1152th	34C													
	3	Analyse 1 TH	Tholen	wi1152th	34C													
	4																	
	5																	
	6																	
	7																	
	8																	
<b>DI</b>	1																	
	2																	
	3																	
	4																	
	5	Geom.en stab.	Pinkster J	mt517	34F	Analyse 2 TH	Tholen	wi1153th	34C	Analyse 3 TH	Tholen	wi1154th						
	6	Geom.en stab.	Pinkster J	mt517	34F	Analyse 2 TH	Tholen	wi1153th	34C	Analyse 3 TH	Tholen	wi1154th						
	7	Geom.en stab.	Pinkster J	mt517	34F	Inl.eindige elem.meth	Hommel	mt825	34F	Sterkteleer 2	Hommel	mt806						mt731
	8					Inl.eindige elem.meth	Hommel	mt825	34F	Sterkteleer 2	Hommel	mt806						mt731
<b>WO</b>	1					Elektrotechniek	Bauer	et2019mt	34F									
	2					Elektrotechniek	Bauer	et2019mt	34F									
	3																	
	4																	
	5	Dynamica A	Wisse	wb1113mt	34E	Mar.werktuigk.1	Klein Woud	mt215	34F	Syst.-regeltechn.1	Dijkstra	wb2104						
	6	Dynamica A	Wisse	wb1113mt	34E	Mar.werktuigk.1	Klein Woud	mt215	34F	Syst.-regeltechn.1	Dijkstra	wb2104						
	7					Mar.werktuigk.1	Klein Woud	mt215	34F	Weerst.voortst.1	Terwisga v.	mt518						mt803
	8									Weerst.voortst.1	Terwisga v.	mt518						mt803
<b>DO</b>	1																	
	2																	
	3																	
	4																	
	5																	
	6																	
	7																	
	8																	
<b>VR</b>	1	Lin.alg. 1 TH	Beek v	wi2256th d1	34C	Lin.alg. 1 TH	Beek v	wi2256th d1	34F	Syst.-regeltechn.1	Dijkstra	wb2104						
	2	Lin.alg. 1 TH	Beek v	wi2256th d1	34C	Lin.alg. 1 TH	Beek v	wi2256th d1	34F	Syst.-regeltechn.1	Dijkstra	wb2104						
	3	Analyse 1 TH	Tholen	wi1152th	34C	Analyse 2 TH	Tholen	wi1153th	34F	Analyse 3 TH	Tholen	wi1154th						
	4	Analyse 1 TH	Tholen	wi1152th	34C	Analyse 2 TH	Tholen	wi1153th	34F	Analyse 3 TH	Tholen	wi1154th						
	5	Dynamica A	Wisse	wb1113mt	34E	Elektrotechniek	Bauer	et2019mt	34F	Sterkteleer 2	Hommel	mt806						mt803
	6	Dynamica A	Wisse	wb1113mt	34E	Elektrotechniek	Bauer	et2019mt	34F	Sterkteleer 2	Hommel	mt806						mt803
	7																	
	8																	

**Veranderingen in roosters kunnen optreden, zie website.**

