MSE - Guide

Master 2004-2005

MSE-Guide

Study guide Master programme Materials Science & Engineering

Colophon

Cover photograph	Laser welding (source: TRUMPF, www.trumpf.com)
Text	Education Support Staff WbMT
Word processing	Student assistant Michiel Warmerdam
Styling	Corrie van der Lelie and Hans van Schuppen
Press	Deltahage, Den Haag
July 2004	Edition of 250 pieces

Preface

This publication is intended as a practical guide for students and it contains information on available courses, electives, exams and relevant contact details.

The Materials Science and Engineering (MSE) master's programme for 2004-2005 offers a broad scope of specialisations as well as a strong generic part that provides the essential understanding of material structure and properties. Students with a bachelor's degree in a wide range of scientific or engineering disciplines can enter the MSE master's programme.

The MSE master's programme is designed to provide high quality education in the field of materials science and engineering. Currently there are six options for specialisation:

- Materials for Art & Archaeology,
- Advanced Functional Polymers,
- Metals Science and Technology,
- Management of Technology,
- Energy, Sustainability and Environmental Impact,
- High Performance Engineering Materials.

All topics are addressed both from a fundamental and a practical point of view offering students the opportunity to acquire the necessary skills for a successful international career in an industrial or applied environment as well as at a research institutes.

The printed version of this publication presents the information available in July 2004. Additions and corrections may emerge at any time: such information will first appear as a "communication" on Blackboard. It will also be incorporated in the electronic version of this document available on Blackboard. Therefore it is advised to access Blackboard for the latest information.

Dr. A.J. Böttger

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MSc programme

1 MSc Materials Science & Engineering

1.1 Goal

The goal of the educational programme Materials Science and Engineering is to educate students to obtain the following qualities:

- Broad and active knowledge of the basic applied sciences
- Broad basic technical and scientific knowledge of the production, the structure and the properties of materials
- Awareness of the challenges and developments in a number of fields of materials science and engineering
- Specialisation in at least one discipline in the field of materials science and engineering
- The ability to contribute to solving multidisciplinary problems and to work both in multidisciplinary teams and independently in an international industrial or academic context
- The capability to conduct experimental, theoretical, and/or computational research on materials of technological importance
- The ability to communicate effectively with team members, scientific colleagues and non-experts in the field.
- The capability to contribute significantly to a scientific paper or an in-depth technological report
- Good awareness of their responsibilities with regard to sustainability, economy, health, safety and social welfare
- The ability to maintain professional competence through life-long learning

1.2 Educational Concept and Assessment

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

Lecture courses (80 EC)
These courses are divided in two parts:

- Compulsory part (40 EC Generic, 30 EC Topical)
- Free elective part to be chosen in agreement with the MSc-Thesis supervisor (at least 10 EC).

Most courses are assessed by means of an oral or written examination.

MSc Thesis Project (40 EC)
The student prepares this thesis as a report of his/her research project. The thesis work is evaluated through an oral presentation by the candidate and an oral examination before an MSc examination committee composed of at least three scientific staff members, including the thesis supervisor. The examination committee may also include external examiners from research institutes or from industrial partners.

1.3 Study programme and general structure

Materials Science and Engineering offers a Master of Science course of two years.
Each course year is divided into 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.

Some examinations will be held orally, most are in the form of a written examination.

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

1.4 Admission to the programme

There are several ways to be admitted to the MSc-programme Materials Science and Engineering. Usually the MSc-programme is a continuation of an academic BSc-programme, however the master's programme can also be entered after completing a BSc-programme of a polytechnic high school or the Royal Netherlands Naval College (KIM). Admission to the MSc-programme is described in the following two subsections.

Bachelors from several programmes of Delft University of Technology and of other universities of the IDEA-League can be admitted to the Masters programme Materials Science and Engineering, provided the following requirements are fulfilled. In this it is assumed that basic knowledge of the field of materials science (for instance as described in the book Materials Science and Engineering, An Introduction by W.L. Callister) has been acquired.

Bachelors Applied Physics who have completed the minor Materials Science and Engineering can directly enter the programme. In their education, three blocks of modules can be identified that are essential for the Masters programme MSE, with the approximate study load in ECTS credit points:

A] Thermodynamics & Kinetics [4 ECTS], Structure of Materials [8 ECTS], Materials Production [6 ECTS], Characterisation of Materials [4 ECTS], Properties of Materials [4 ECTS]
B] Waves [4 ECTS], Quantum mechanics [4 ECTS], Solid State Physics [4 ECTS]
C] Linear Algebra [6 ECTS], Differential Equations [4 ECTS]

Bachelors from **Applied Physics** who have not completed the minor in Materials Science and Engineering must complete the modules of block A.

Bachelors from **Chemical Engineering** must complete the modules of blocks A (except Thermodynamics) and B.

Bachelors from **Mechanical Engineering, Marine Technology and Aerospace Engineering** must complete the modules of blocks A (except Thermodynamics) and B.

Bachelors from **Industrial Design** must complete the modules of blocks A, B and C (except Linear Algebra).

Other TU bachelors and students with a bachelor degree of a Dutch polytechnic high school (TH) will have to have the contents of their study evaluated and need to contact the Education Co-ordinator dr.ir. R. Delhez (r.delhez@tnw.tudelft.nl) for a detailed assessment of their entry requirements (which is also advised to the other bachelors).

The modules of block A are taught in a very condense manner in the Synchronisation Course of 5 weeks, with which the programme MSE starts in September.

1.5 MSc-programme Materials Science & Engineering

Materials Science and Engineering is an interdisciplinary field involving the study of physical, chemical and mechanical aspects of material properties, materials production processes, materials characterisation and selective materials usage.

A new Master of Science programme for Materials Science and Engineering has been prepared for delivery in September 2003. The programme provides considerable flexibility for students with interests ranging from fundamental material properties through design and selection to materials applications in areas as diverse as engineering, science and the arts. The programme is designed for both Dutch and international students and will be offered in the English language.

The aim of the programme is to furnish a high quality, multi-disciplinary education, producing graduates capable of making immediate and significant contributions to a wide range of industrial and academic areas at a global level. The objectives are:

- to provide students with a sound and thorough understanding of the underlying scientific and engineering principles involved in materials science and engineering
- to enhance knowledge of materials selection, processing and characterisation with relevance to a broad range of applications in engineering, science and the arts
- to build an awareness of the environmental, economic and human aspects of materials selection, usage, recycling and disposal.
- to develop skills in the planning, execution and reporting of materials processing, characterisation, and implementation for relevant applications

The programme provides a comprehensive knowledge of the properties and the production of materials linking fundamental aspects at the atomic level to production techniques and applications. The two-year programme is a combination of academic subjects and active research. Course modules are delivered by lectures, workshops and seminars, and assessment is based on written and oral examinations, course work and a thesis derived from the research project. The first year is a compilation of compulsory and elective lecture modules and laboratory activities. The second year is primarily devoted to the topical course and the research element.

The programme is structured around a Generic Course which provides the basic knowledge required by all Materials Science Masters graduates, a Topical Component, focusing on a selected area of interest, and a Research Element (specialisation). Each aspect of the programme attracts one third of the total credit points. Elective modules are offered within the topical course to cater for the broad ranging interest of many students.

Before entering the programme, prospective students receive an individual assessment and are provided with opportunities to upgrade their knowledge during an introductory Synchronisation Course prior to undertaking the Generic Programme. The combination of topical, elective and research subjects offered provides opportunities to tailor the programme to meet the specific requirements of individual students. Optional modules are chosen by the candidate in consultation with the prospective research supervisor.

Research project outside university (industry or other educational institution)
The taught elements of the Materials Science and Engineering masters programme are mostly delivered in house during the first year and initial weeks of the second year of this two-year programme. The possibility exists for the research project, or part of the research project, to be undertaken in an industrial environment or in collaboration with another educational institution or museum, subject to approval of the student's supervisor.

MSc programme structure
The flexible two year programme, with a total of 120 EC, comprises a generic component, which provides the general foundation for the Materials Science and Engineering Masters Programme, followed by a focused topical course and a research element. In addition, the programme includes a short introductory component designed to provide a common basis for the generic teaching.

The Generic course encompasses the core knowledge required by all Materials Science and Engineering Masters students. The purpose is to provide a firm grounding in the fundamental aspects of the subject upon which more specialised or wider ranging interests can be built. The topical component provides opportunities for specialisation; four topical options are offered and may be chosen according to the interests of the student. Each option will focus on scientific, engineering and applications related issues in the selected fields of:

- Materials in Art and Archaeology
- Advanced Functional Polymers
- Metals Science and Technology
- Management of Technology

A further two options covering Materials Science for Energy, Sustainability and Environmental Impact and High Performance Engineering Materials will be available as annotation/specialisation. The topical programme will account for 30 EC, with a further 10 EC for elective modules.

In the final programme component (40 EC) students will undertake a literature study and an independent scientific investigation. This research project (thesis) can be related to the chosen topical theme and specific area of interest and will be offered at the leading edge of the field. The research project may also be pursued outside the university in conjunction with industry or in collaboration with another educational institution.

1.5.1 Course program

This programme aims to prepare honours graduates, from a scientific or engineering background, for a successful career in the broad field of Materials Science and Engineering. The programme offers considerable flexibility to students with interests ranging from fundamental material properties through design and selection to applications in engineering, science and the arts.

The 2-year full-time programme comprises three elements:

A. A generic programme, providing essential understanding of material structure and properties, which is given to all Materials Science and Engineering masters students
B. An elective topical component, covering one aspect from the materials field in more detail. Options include:
    1. Materials for Art & Archaeology (MAA)
    2. Advanced Functional Polymers (AFP)
    3. Metals Science Technology (MST)
    4. Management of Technology (MoT)
    5. Energy, Sustainability and Environmental Impact (now an annotation, may develop into a topical component)
    6. High Performance Engineering Materials (now a specialisation, may develop into a topical component)
C. An individual research project, focusing on one area of specific interest at the cutting edge of the field.

In addition a short, intensive introductory synchronisation course is offered at the start of the first year to provide students of varying backgrounds with a structured opportunity to achieve the knowledge level required for this demanding programme.

Generic Programme
The Generic component of the programme encompasses the core knowledge required for all Materials Science and Engineering MSc students. The purpose is to provide a firm grounding in the fundamental aspects of Materials Science and Engineering upon which more specialised or wider ranging interests can be built.

The programme comprises the following modules:

Course Code	Course Name	Lecture hours	Co-ordinator	Lecturers	ECTS credits
MS3011	Semiconductor Devices and Magnetism	0/4/0/0	Thijsse	Thijsse	3
MS3021	Metals Science	0/6/0/0	Richardson	Richardson, Sietsma, Sloof, De Wit	4
CE4011MS	Polymer Science	0/4/0/0	Picken	Picken, Wübbenhorst	4
CE4021MS	Ceramics Science	0/4/0/0	Goossens	Goossens, van de Krol	3
CE4031MS	Mechanical Properties	0/4/0/0	M. Janssen	M. Janssen, Wübbenhorst	3
TA4300	Production and Recycling	0/0/4/0	Reuter	Reuter	3
MS3031	Computational Materials Science	0/0/6/0	Thijsse	Thijsse, Sietsma, van der Giessen, Bakker	4
MS3041	Characterisation Techniques	0/0/4/0	Sloof	Sloof, Zandbergen	3
MS3051	Nanomaterials and Biomaterials	0/0/0/4	Zandbergen	Zandbergen	3
MS3441TU	Physics and Technology of Thin Films	0/0/6/0	Böttger	Böttger, G. Janssen, Wübbenhorst	4
WM0710TU	Technology and Society	10/0/0/0	Wiersma	Kroesen, Wiersma	6

Materials in Art & Archaeology (MAA)
The objective of the MSc profile 'Materials in Art and Archaeology' is to instil in students an awareness and knowledge, at academic level, of the applications of Materials Science and Technology in these fields.
The profile covers activities in the important professional fields of:

- Materials: History, Properties, Modern analysis techniques
- Art history and Archaeology, Authenticity research
- Materials degradation and countermeasures

The Materials in Art & Archaeology activities have strong collaborative links with other universities, with the Netherlands Institute for Cultural Heritage (ICN) and with museums.

Course code	Course name	Lecture hours	EC
MS3201	Materials classes and properties	x/0/0/x	6
MS3211	Modern analysis techniques	x/0/0/x	6
MS3221	History of materials production and usage	x/0/0/x	3
MS3231	Art history	x/0/0/x	4
MS3241	Archaeology	x/0/0/x	4
MS3251	Materials degradation and countermeasures	x/0/0/x	4
MS3261	Authenticity research	x/0/0/x	3

x/0/0/x means that the lecture will be given either in the last period of the first year or in the first period of the second year. Contact coordinator (Dr. Joris Dik, j.dik@tnw.tudelft.nl) for more information.

Advanced Functional Polymers

The mission of the MSc profile in Advanced Functional Polymers is to educate students to design, characterize and process functional polymer materials for optical, electronic and high performance mechanical applications.

The profile covers activities in the important professional fields of:

– Polymer Chemistry/Synthesis
– Polymer Physics/Characterisation
– Polymer Engineering/Processing

The Polymer Materials and Engineering activities have strong inter-faculty links within TU Delft as well as collaborative links with other Dutch Universities and with industry.

Course Code	Course Name	Lecture hours	Lecturer	EC
MS3301	Structure Formation and Characterization	0/0/0/6	Picken, Jager	4
MS3311	Polymer Dynamics & Modelling I	0/0/4/0	Gotsis, Wuebbenhorst	3
MS3321	Polymer Dynamics & Modelling II	4/0/0/0	Kearley, Mendes	3
MS3331	Advanced polymer applications I	0/0/0/4	Gotsis, Picken	3
MS3341	Advanced polymer applications II	4/0/0/0	Mendes, Wuebbenhorst	3
MS3351	Polymer processing	0/0/0/4	Gotsis	3
MS3361	Industrial polymerisation processes	0/0/0/4	Jager, Dingemans	3
MS3371	Recent developments in Adv. Pol. Sci.	6/0/0/0	Several AIO's	4
MS3381	Practicum Characterization & processing	x/0/0/0	Gotsis, Picken, Mendes	4

Metals Science and Technology

The aim of the MSc profile Metals Technology is to focus on design, characterisation, engineering, production and performance of metallic microstructures to meet the challenges of our future.
The principal subject areas within this profile fall under the broad headings of:

- Production and processing of metals
- Properties of materials and their microstructure
- Performance of metals

The Metals Science and Technology activities have strong inter-faculty links within TU Delft as well as collaborative links with the Netherlands Institute for Metals Research (NIMR) and with industry.

Course code	Course name	Lecture hours	Lecturer	EC
MS3401	Primary metals production	0/0/0/4	Boom	3
MS3411	Processing of metals	0/0/0/10	Katgerman	6
MS3421	Developments in production and processing	3/0/0/0	Duszczyk	2
MS3471	Welding engineering and Non-Destructive Testing	0/0/4/0	Richardson	3
MS3431	Determination of microstructure	0/0/0/6	Sloof	4
MS3441	Relation between properties and microstructure	6/0/0/0	Sietsma	5
MS3451	Total Performance Approach & Sustainable technology: case studies	4/0/0/0	Katgerman	4
MS3461	Corrosion and protection against corrosion	4/0/0/0	de Wit	3

Management of Technology

The specialization "Management of Technology" supplies MSc students with basic knowledge, insight and competence of non-technical nature in the fields of (i) management of projects, innovation, knowledge and research & development, (ii) strategy of enterprises, (iii) corporate structure, (iv) decision making and (v) patents. This specialization adds a branch to the students knowledge of materials science and engineering that may be very useful for a role in industry and organizations, as well as in entrepreneurship.

Course code	Course name	Lecture hours	Lecturer	EC
WM0517TU	Strategisch management van ondernemingen	0/0/2/0	Van der Duin, Den Hartigh, Zegveld	6
MOT1450	Decision Making	0/0/0/4	Dicke	6
	Patentrecht	x/0/0/0		3
MOT9501	Advanced Project Management and Corporate Structure	x/0/0/0		6
MOT2420	Knowledge Management and R&D Management	0/4/0/0	Andriessen, Wissema	6
WM0621TU	Managing Innovation	2/2/0/0	Kleinknecht	3

Research Project
In the final programme component (40 ECTS credit point) the individual student will undertake a literature study and an independent scientific investigation. This research project (thesis) may be related to the chosen topical theme and specific area of interest. The research project may also be pursued outside the university in conjunction with industry or in collaboration with another educational institution.

Potential projects include:

- Laser-plasma welding
- Computer simulation of friction and adhesion
- New nanostructured ultrahard coatings
- Design of X-ray equipment for use on Mars
- Hydrogen storage for energy applications
- Authenticity of Van Gogh paintings
- Nanostructure of soap, water, and oil
- Single-grain observation of phase transformation
- Towards new light emitting polymers
- Modelling of microstructure during solidification

1.5.2 Annotation Sustainable Development

As an addition to the variant programme the annotation Sustainable Development can be done. After completing the annotation, the student gets a supplement to the MSc-degree, which declares a more than average knowledge about that subject.
The study programme, including the annotation, has to comply with the requirements of paragraph 1.2 (120 EC).

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

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

Further information on the available courses can be obtained at the website
http://www.odo.tudelft.nl
For enquiries concerning the colloquium and enrolling:
Gertjan de Werk, g.dewerk@tbm.tudelft.nl.

The following three courses (total of 10 EC) can form part of an annotation Sustainable Development:

- WB4303 Energy, Society and Sustainability (3 EC)
  Lecturer: Prof. Dr. Ing. H. Spliethof
- SM1551 Molecular Engineering I (3 EC)
  Lecturer: Prof. Dr. J. Schoonman
- Materials for Sustainable Energy Storage and Conversion (4 EC)
  Lecturers: Prof. Dr. I.M. Richardson and Dr. Ir. W.G. Sloof

1.5.3 Specialisation High Performance Engineering Materials

The following courses are possible electives for the specialisation High Performance Engineering Materials:

High Performance Materials
(light-weight and high-strength materials, e.g. Al, Mg, Ti, (ultra) high-strength steel, polymers, composites and ceramics)

Course code	Course name	EC
WB1430a	Composite Materials for Durable Structures	3 EC
WB1430B	Fibre Reinforced Plastics, extended course	6 EC
MT816	Composite Materials for Ship Construction	2 EC
WB1432	Mechanics of Fibre Reinforced Plastics	4 EC

Production and Joining technology

Course code	Course name	EC
AE4-786	Sheet Metal Forming	3 EC

Mechanical Response, Failure Behaviour and Environmental Degradation of Products

Course code	Course name	EC
AE4-729	Fatigue in Structures and Materials	3 EC

1.5.4 Technical University Teacher Course (TULO)

Graduated Masters of Science Systems and Control, 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 EC can be integrated in the MSc study programme, the other, at least, 30 EC have to be earned in a post MSc course.
For more information on admission to the programme and the study programme please contact the office of TULO.

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

1.6 Study and internship abroad

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

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

If you have a clear idea about where you want to go to, you can ask the Coordinator for International Exchange for advise about your programme at the foreign university and about the recognition of your results at the host university. Your graduation professor will judge your work afterwards according to the rules you agreed upon, prior to departure. The foreign programme should at least contribute 12 EC to your MSc programme.
To arrange everything you have to do a lot yourself. Therefore you have to take a preparation period into account of preferably a year, but at least half a year.

Internship
Usually 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 is available at the website:
http://www.sfc.tudelft.nl.

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

1.7 Enrolling for courses and tests

There are different procedures to enrol. Usually it is necessary to enrol 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 Blackboard.

Tests Enrolling for tests is compulsory and can be done at the TAS-site ('Tentamen Aanmeld Systeem' http://www.tas.tudelft.nl). This should be done two weeks before the test takes place, at the latest, otherwise the test will not be accounted for by the lecturer. If a student has enrolled, but decided not to do the test, the student must cancel this, at least one week before the test takes place.

Using TAS When first using TAS the student must choose a personal password. This can be done by using the campus card in a card reader. At the faculty there are two card readers: one is located near the Pallas / Parthemus computerroom (4, 1st) and one is located at Education support staff (8B, 2th).

1.8 Pass rules and criteria for 'cum laude'

Pass rules To pass a course or assignment, a grade of at least 6 is necessary. It is possible to pass the MSc- examination with one grade of 5. The grades are rounded off to the nearest integer.

Re-sits For those subjects where written examinations are held, the student will get at least one opportunity per year to do a re-sit. Re-sits generally take place in the first period after the regular period for a certain examination. Re-sits for the tests given in period 2B are scheduled in the second half of August.

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.

'cum laude' At the discretion of the examinations board, a candidate for the Master's degree can receive the designation "cum laude" if he or she meets the following conditions:

a the mark awarded to the components specified in the Master's examination implementation procedures shall average no less than 8, excluding the Master's Thesis 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 two and a half 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".

This is part of the "Regulations and guidelines for the board of examiners", appendix 6.1 of this studyguide.

1.9 Profile of the Engineer Materials Science & Engineering

The MSc programme in Materials Science and Engineering at the TU Delft combines the skills and management of a standard engineering programme with the knowledge of the various types of structures, mechanisms and limits that govern our material world, applying physics, chemistry and mechanical engineering with the depth and insight close to that expected from bachelors in physics, chemistry and mechanical engineering. Completion of the programme prepares the graduates for contributions and advancements related to the field of materials science and engineering in any industry, research institute or academia. Such contributions and advancements are the development of new materials, the understanding and improvement of existing materials, their properties, their production and processing.

1.10 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 into account:

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.

Parafrasing

Parafrasing 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 your 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

Cheating is wider than plagiarism and also includes taking a look at other's work during exams or refusing to make a 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.

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

2.2 Education support staff

The education support staff is executing the education support of the study Materials Science & 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	j.kleinwoud@wbmt.tudelft.nl	Tel. 015 27 81556
ir. Nic-Jan van Bemmel	Manager Educational Programmes	n.j.vanbemmel@wbmt.tudelft.nl	Tel. 015 27 88791
Fatma Çinar	Education Administration office	f.s.cinar@wbmt.tudelft.nl	Tel. 015 27 86753
Teuni Eden	Student adviser	t.eden@wbmt.tudelft.nl	Tel.015 278 2176
Lies Gesink	Education Administration office	e.g.gesink@wbmt.tudelft.nl	Tel. 015 27 86591
Louise Karreman	Study Administration office	l.m.karreman@wbmt.tudelft.nl	Tel. 015 27 83457
Ewoud van Luik	Manager Education Administration office & webmaster	e.p.vanluik@wbmt.tudelft.nl	Tel. 015 27 85734
dr. ir. Dick Nijveldt	Educational Adviser & Coordinator international exchange	d.nijveldt@wbmt.tudelft.nl	Tel. 015 27 85921
Carel Piguillet	Software Support	c.f.f.piguillet@wbmt.tudelft.nl	Tel. 015 27 86820
Mascha Toppenberg	International MSc-coordinator	m.p.i.toppenberg@wbmt.tudelft.nl	Tel. 015 27 86959
ir. Jaap v.d. Zanden	Student adviser	j.vanderzanden@wbmt.tudelft.nl	Tel. 015 27 82996

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

2.3 Education committee

The education committee advises the dean and the education director on the contents and the structure of the study programme and the examinations.
The education committee comprises four lecturers and four students. Also the education director, the education adviser and a student adviser take part in the meetings.

Chairman Prof. ir. Laurens Katgerman
Room 0.58
Rotterdamseweg 137
2628 AL Delft
phone: (015) 2782249
e-mail: L.Katgerman@tnw.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. dr. Barend J. Thijsse
Room 2.21
Rotterdamseweg 137
2628 AL Delft
phone: (015) 2786730
e-mail: B.J.Thijsse@tnw.tudelft.nl

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

2.5 Students association "Het Gezelschap Tubalkaïn"

'Het Gezelschap Tubalkaïn' ('Tub' for short) was founded in 1952 to represent the interests of all Materials Science and Engineering students. The name 'Tubalkaïn' finds it origin in the Bible. In Genesis (4:22) Tubalkaïn is referred to as: a master of everybody who works in copper and iron.
Tub has a continuous 'open door' policy, encouraging students to drop by with queries and comments. Obviously you can also come in for a friendly chat and laugh. Tub membership counts for 90% of all Materials Science students.
Tub organises excursions on a regular basis. These aim to familiarise students with the workfield. Every other week there is a 'borrel' (drinks reception) in order to promote friendly relations between students and staff. These occasions are ideal opportunities to pick the brains of more senior students, and to have informal discussions with lecturers and other members of staff.
Don't forget! You can always drop by when you have questions or when you are just in the mood for a chat.

Student Association "Het Gezelschap Tubalkaïn"
Room 033 (ground floor), Materials Science & Engineering Building
Rotterdamseweg 137, Tel: 27 82245
e-mail: tubalkain@tnw.tudelft.nl
http://www.tubalkain.com

2.6 Student guidance

2.6.1 MSc coordinator

The MSc coordinator is the person for questions or problems related to Individual study programme and monitoring.
Every student should contact the MSc coordinator at your earliest convenience, but certainly before the end of the first semester. In agreement with the MSc coordinator, the student sets up an individual study programme using the following ingredients: compulsory courses, your current ideas about the theme of the thesis project, the specialisation courses that bridge the gap between the compulsory courses and the thesis project and your use of the free elective space.
In order to finish the programme in two years, the student should plan to take an average of 30 credits worth of courses per semester. At the end of the first semester, the student and the MSc coordinator will discuss the progress and performance. The student submits his/her plan for approval to the Examinations Board at the start of the second semester.

2.6.2 Student advisers

For assistance and advise 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 2th 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 2th 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 recommended to do no 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
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 examined 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 study administration.
The website, however always contains the most recent information. Announcements, which are of importance for the study, like changes in the schedules, are made timely on

Blackboard

the homepage of the faculty and at Black Board.
Schedules about the lectures, assignments and examinations are available at the desk of the study administration. At the homepage of the faculty and Black Board the changes in

Grades

these schedules are given. Grades can also be found on blackboard.
Information that is not related directly to the study e.g. information by students association 'Het Gezelschap Tubalkain', will be published on publication boards and on the Materials Science Intranet. Members may also receive e-mails.

2.10 Rules and Regulations

Student Statute (Studentenstatuut)
The Student Statute is made up of a Students' Charter which applies to the whole TU Delft and an Education Specific Part of the Student Statute (OSDS) which applies to the education and the exams of the study Materials Science & Engineering.
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 Materials Science & Engineering (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
1st hour:	8.45	9.30
2nd hour:	9.45	10.30
3rd hour:	10.45	11.30
4th hour:	11.45	12.30
5th hour:	13.45	14.30
6th hour:	14.45	15.30
7th hour:	15.45	16.30
8th 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 to F, bigger lockers can be used to store helmets. At the end of the study year, before the 15th of July, the lockers should be empty and the keys should be returned. Lockers, still in use after the 15th of July, will be provided with a new lock at the 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 of 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 than they were supposed to be used:
  - Download, upload or fileshare of copyright protected items, such as texts, audio and video files, in any format.
  - Download and install any applications on the faculty computers.
  - Play 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 a 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, 1st = 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, (graduation) presentations and instructions. The next table shows all the lecture rooms, their capacity and their location of the Building for Mechanical Engineering and Marine Technology.
Meeting rooms are available for meetings, discussions etc. of small groups of students. Reservations can be made as the desk of the education support staff.

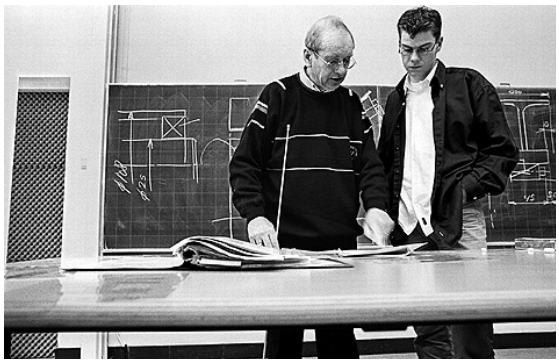
Room	Capacity	Location
A	300	6, BG
B	200	6, BG
C	150	6, BG
D	150	6, BG
E	70	6, BG
F	70	6, BG
J	50	8D, 1st
K	30	8G, 1st
L	30	8G, 1st
Meeting room 4		8B, 2nd
Meeting room 5		8B, 2nd

During this course year most of the lectures MS&E will take place in the building of Materials Science, Rotterdamseweg 137 in the following lecture rooms:

Room	Capacity	Location
A	160	Ground floor
B	25	2nd floor
C	25	Ground floor
2.49	15	2nd floor
1.95	10	1st floor

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.



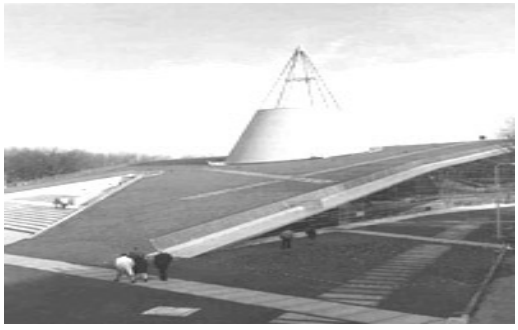
3.3 Computer rooms

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 no 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, 1st
Parthemus room	4, 1st
Pallas room	4, 1st
Design studios	8G, BG
W.G. Burgerszaal	40, 0.36 (Ground Floor)

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.



3.5 Library

Central library

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

The library of the TU Delft consists of a main building and smaller faculty libraries . The main building has a large collection of books and magazines. The main part of the collection can be borrowed 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 borrow 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.

		Lecture period	Exam period	Summer holiday
Opening hours	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
Book desk	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

Department Library

The department library has a collection specifically for Materials Science and Engineering. The library is located at the first floor at Rotterdamseweg 137, entrance through room 1.17

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 Personal Identification (passport, driver's licence, etc.) and an Address Identification (recent bank statement, insurance policy, etc.). The library card is free of 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.
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 acces 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 5.1
Adams 12
Ansys 5.7.1
Autocad 14
Autocad Lite 2002
Borland Pascal 7.0
Card
CMS
Corel Draw
Flash
GSP 9.111
Holtrop
Internet Explorer 6.0
Maple 8
Mathcad 5.0
Mathtype 4
Matlab 6.1
Microsoft Frontpage 2000
Microsoft Office 2000
Microsoft Visual Basic 6.0
News Xpress
Paint Shop Pro 7
Powerarchiver 6.1
Pro Engineer 2001
Qres
Real One Player
Shockwave
SMS
Sophos Antivirus
TAS
TNT Lite 6.6
WBalance
Workpace
WS-FTP LE 5.08

3.9 Catering

The faculty offers a variety of catering facilities.

Canteen The faculty canteen serves a comprehensive lunch. The canteen can be found at location 10, BG.
The canteen at Rotterdamseweg 137 can be found in the basement.

Coffee corner 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'.

Faculty room The faculty room is a place for giving symposia, meetings or graduation drinks ("afstudeerborrels"). A reservation can be made at the reception desk.

Lagerhuysch 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 giving graduation drinks (afstudeerborrels), but also for organising symposia and meetings. The students associations Gezelschap Leeghwater and William Froude regularly organise activities. On the site http://www.lagerhuysch.tudelft.nl a route description and a reservation form for the Lagerhuysch can be found.

Auditorium Within the TU Delft auditorium a variety of catering facilities is available. Lunch time is from 11.30 till 13.30, diner time from 16.30 till 19.30. See appendic 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 would like to express him/her self in an artistic manner can do this is at the CulturalCentre. 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 acces facilities for student accommation 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

AE4-729	Fatigue in Structures and Materials
Lecturer	
Course Material	
Description	1. Introduction to Fatigue of Structures and Materials, 2. Fatigue as a phenomenon in the material, 3. Stress concentrations at notches, 4. Residual stresses, 5. Stress intensity factors of cracks, 6. Fatigue properties of materials, 7. The fatigue strength of notched specimens, analysis and predictions, 8. Fatigue crack growth, analysis and predictions, 9. Load spectra, 10. Fatigue under variable-amplitude loading, 11. Fatigue crack growth under variable-amplitude loading, 12. Fatigue and scatter, 13. Fatigue tests, 14. Surface treatments, 15. Fretting corrosion, 16. Corrosion fatigue, 17. High-temperature and low-temperature fatigue, 18. Fatigue of joints, 19. Fatigue of structures. Design procedures
Education	**EC** 3
Assessment	

AE4-786	Sheet Metal Forming
Lecturer	
Course Material	
Description	One part of the course deals with the theory of sheet metal forming processes, including topics like: stress-strain curves and workshop properties, forming limit curves, yield criteria, (an)isotropy, heat treatments, spring back, work hardening and strain measurements and evaluation. Another part of the lectures series deals with different production processes for sheet metal forming, like bending operations, rubber forming processes, deep drawing, explosive forming, stretching, superplastic forming. In addition some aspects like manufacturability analyses, production in batches, etc. will be discussed. Mechanical Response, Failure Behaviour and Environmental Degradation of Products
Education	**EC** 3
Assessment	

CE4011MS	Polymer Science
Lecturer	Picken, Wübbenhorst
Course Material	
Description	Comprises an introductory part where topics such as polymerisation, chain statistics, amorphous and crystalline structures, mechanical properties (modulus, strength, brittle-ductile behaviour, DMA) will be covered as a follow-up of the Synchronisation Course. Subsequently, those aspects of polymers that will be dealt with in full detail are structure characterisation techniques (XRD, SANS, SALS, imaging techniques), acoustic and thermal properties, processing, introduction to polymer dynamics and rheology, advanced and functional applications for liquid-crystals, super-fibres, (nano)composites, electro-active and conducting polymers and poly-LED's.
Education	Lecture **EC** 4
Assessment	

CE4021MS	Ceramics Science	
Lecturer **Course Material**	Reuter	
Description	The production, structure and properties of ceramic materials will be covered in this module. The focus is on the application of these materials on the basis of a wide range of properties.	
Education **Assessment**	Lecture	**EC** 3

CE4031MS	Mechanical Properties	
Lecturer **Course Material**	M. Janssen, Wübbenhorst	
Description	Mechanical properties of materials from different classes will be treated, emphasising similarities in the structural aspects and behaviour of the materials, but also focussing on the specific differences in material classes. Among the properties covered are fatigue, high-temperature deformation and mechanical behaviour of composite materials.	
Education **Assessment**	Lecture	**EC** 3

MOT1450	Decision Making	
Lecturer **Course Material**	Dicke	
Description	Decisions are made in so-called 'networks' of actors. This course focuses on the management of organizational networks. Network approaches are a response to models in which management is seen as a more or less rational and sequential process from problem identification to evaluation and feedback. In network approaches, actors within organizations depend on each other for the realization of their aims and for this reason maintain ongoing relations with each other. Managers make use of these relations in several ways. In this course the general network concept will be discussed thoroughly and will be applied to the management of high technology organizations.	
Education **Assessment**	Lecture	**EC** 6

MOT2420	Knowledge Management and R&D Management
Lecturer	Andriessen, Wissema
Course Material	
Description	This module will give students knowledge, insight and competence with regards to the selection, procurement, development, implementation and maintenance of technical know-how in companies. The competence is related to KM and R&D management as well to social interaction
Education	Lecture **EC** 6
Assessment	

MOT9501	Advanced Project Management and Corporate Structure
Lecturer	
Course Material	
Description	Under development.
Education	Lecture **EC** 6
Assessment	

MS3011	Semiconductor Devices and Magnetism
Lecturer	Thijsse
Course Material	
Description	This module builds upon general BSc-level modules in Solid State Physics and Quantum Mechanics. The subjects covered are: electron behaviour in semiconductors, semiconductor devices, magnetic materials, lasers, and optoelectronics. The approached is focused on the engineering aspects.
Education	Lecture **EC** 3
Assessment	

MS3021	Metals Science
Lecturer	Richardson
Course Material	
Description	This module examines the structure and properties of metals, a vital class of materials in our technological society, across a range of length scales, addressing issues of microstructural changes and phase transformations, metals production techniques and the behaviour of metals in generic applications.
Education	Lecture **EC** 4
Assessment	

MS3031	Computational Materials Science
Lecturer	Thijsse, Sietsma, van der Giessen, Bakker
Course Material	
Description	This module introduces computer simulation methods for studying materials behaviour at various length and time scales. The main subjects are the current possibilities and limitations of each method, criteria for selecting a particular method, and examples from practice. Students will present and discuss selected scientific papers in workshops.
Education	Lecture **EC** 4
Assessment	

MS3041	Characterisation Techniques
Lecturer	Sloof, Zandbergen
Course Material	
Description	This module deals with the principles and applications of advanced methods and techniques for chemical composition and microstructure analysis of materials.
Education	Lecture **EC** 3
Assessment	

MS3051	Nanomaterials and Biomaterials	
Lecturer	Zandbergen	
Course Material		
Description	This module will treat the main aspects of the structure, properties and applications of new materials in development, especially nanomaterials and biomaterials. Among the topics covered are forces in the human body, physiology of mammals, degradation in the body, biomaterial interaction, modelling in biomaterials, biomaterials applications, nanoscale materials, MEMS and NEMS, fabrication of nanoscale materials, selforganisation, nanoscale (opto)electronics and magnetics, Fullerenes/C-materials, spintronics	
Education	Lecture	**EC** 3
Assessment		

MS3201	Materials classes and properties	
Lecturer		
Course Material		
Description	Materials considered in this module include pigments, paints and inks and how these have developed over the years. The structure and behaviour of man made and natural materials including polymers, stone, metals, glasses, ceramics and textiles are also of importance. The durability of these materials and of materials such as paper photographs and films is important to dating and preserving artwork and archaeological artefacts.	
Education	Lecture	**EC** 6
Assessment		

MS3211	Modern analysis techniques	
Lecturer		
Course Material		
Description	Several powerful techniques are available for materials analysis including optical microscopy for visual inspection and infrared reflectometry and electron microscopy for detailed analysis of material structure. Electron spectroscopy and X-ray diffraction and imaging techniques together with fluorescence methods and chromatography help to establish material compositions, whilst nuclear techniques are of importance for dating of organic materials and measurement of isotopic composition.	
Education	Lecture	**EC** 6
Assessment		

MS3221	History of materials production and usage
Lecturer	
Course Material	
Description	In the history of the visual arts and human artefacts the production techniques have undergone considerable changes. Therefore, the historical context of materials must, at all times, be taken into account when interpreting analytical data obtained by current experimental research on the objects themselves. For such knowledge the disclosure of historical literary sources is often crucial.
Education	Lecture **EC** 3
Assessment	

MS3231	Art history
Lecturer	
Course Material	
Description	Art history is the discipline that studies artistic production from the early Middle Ages to the most recent past. The focus lies on the interpretation of art objects within their historical context. In recent years a new branch of art history has evolved, referred to as technical art history. This discipline studies the techniques and materials used in the production of artworks. Knowledge of these aspects is of importance in conservation issues, authenticity questions and general art historical interpretation. The aim of the course is to provide the student with a general insight into the history of artistic production.
Education	Lecture **EC** 4
Assessment	

MS3241	Archaeology
Lecturer	
Course Material	
Description	Archaeology deals with past human lives and their activities as shown by material relics. The material study of these remains is often crucial, as historical records are rare or completely non-existent. Thus, material analysis of archaeological remains is often the only way to study a past culture. The application of the natural sciences to these remains is referred to as archaeometry. The aim of this course is to provide the student with an overview of archaeological problems and the possibilities of the scientist to provide answers to these questions.
Education	Lecture **EC** 4
Assessment	

MS3251	Materials degradation and countermeasures
Lecturer	
Course Material	
Description	Every artwork or artefact is subject to decay in the course of time. Material changes occur under the influence of various degradation factors, such as UV radiation, humidity and other environmental aspects. Knowledge of the ageing processes and the underlying physical and chemical changes is crucial for effective conservation and restoration of art.
Education	Lecture **EC** 4
Assessment	

MS3261	Authenticity research
Lecturer	
Course Material	
Description	Fake or genuine? This is a daily question for many art historians. Traditionally, authenticity research is carried out purely by visual examination of an art object. Materials analysis offers a complementary and verifiable method to examine the authenticity of objects. Teaching will be based on class, laboratory and museum activities and will include field assignments and case studies.
Education	Lecture **EC** 3
Assessment	

MS3301	Structure Formation and Characterization
Lecturer	Picken, Jager
Course Material	
Description	The module on polymer Structure Formation and Characterization involves polymer chemistry and properties including crystalline structure and glass transition. The module covers phase diagrams: semi-crystalline polymers, block-copolymers and liquid crystal polymers and characterisation methods including X-ray diffraction, electron microscopy (scanning and tunnelling), atomic force microscopy and small angle neutron and light scattering.
Education	Lecture **EC** 4
Assessment	

MS3311	Polymer Dynamics & Modelling I
Lecturer	Gotsis, Wuebbenhorst
Course Material	
Description	This module focuses on the dynamics of polymer chains and its manifestation in the mechanical (DMA, Rheology), thermal (DSC) and dielectric response (DRS). The module covers the fundaments for the understanding of the various specific relaxation processes and flow behaviour of polymers which are related to typical length scales of the polymer chain. The theoretical basis involves linear response theory, microscopic models for chain dynamics (Rouse and reptation model) and concepts for the description of rubber elasticity and non-Newtonian melt flow.
Education	Lecture **EC** 3
Assessment	

MS3321	Polymer Dynamics & Modelling II
Lecturer	Kearley, Mendes
Course Material	
Description	Part II of the module on Polymer Dynamics focuses on scattering techniques that are used to probe polymer dynamics at different time and length scales. The most popular radiation scattering techniques such as quasi-elastic light scattering (QELS), incoherent neutron scattering (INS) and to a certain extent, small angle x-rays and neutron scattering (SAXS, SANS) are also discussed. An introduction on computational modelling, such as molecular dynamics (MD), Monte Carlo (MC) and fluid dynamics (FD) is given. Finally, polymer dynamics near surfaces, at interfaces or in confined environment are also considered.
Education	Lecture **EC** 3
Assessment	

MS3331	Advanced polymer applications I
Lecturer	Gotsis, Picken
Course Material	
Description	Subjects: polymer (nano)composites and liquid crystal polymers. The first part of the module gives an introduction to the structure and properties of conventional composites. The effects of the matrix and fibre properties and of the interface on the composite are discussed, as well as the mechanics and strength of laminates with different orientation. The second part deals with the mechanical and optical properties of liquid crystal polymers. This includes a discussion on the various liquid-crystal phases, phase transitions and characterisation. The effect of orientational-order on polymer properties is discussed – especially in relation to modulus and strength of super-fibres, and the optical properties of LCP's for data-storage and smart optical components.
Education	Lecture **EC** 3
Assessment	

MS3341	Advanced polymer applications II
Lecturer	Mendes, Wuebbenhorst
Course Material	
Description	Part II of the module on advanced polymer applications focuses on "smart" polymers, i.e. polymers responsive to external stimuli (piezoelectric, ferroelectric, non-linear optically active or photochromic polymers), and polymers specifically designed for particular device applications like poly-LED's, polymer dispersed liquid crystals (PDLC's) and devices based on the photovoltaic and photorefractic effect. Soft wet polymer systems that are pH or temperature responsive, magneto-mechanical responsive or used in medicine encapsulation are also discussed.
Education	Lecture **EC** 3
Assessment	

MS3351	Polymer processing
Lecturer	Gotsis
Course Material	
Description	This module gives an overview of the processes used to transform the raw polymeric material (pellets, powder) to shaped plastic articles. After an introduction to the physical properties of polymers that are relevant to their processing and a brief crash course in fluid mechanics, polymer processing is analysed as a set of elementary general processing steps. The common processing equipment are then discussed in view of these elementary processes. Blending of polymers is also an important feature of the module.
Education	Lecture **EC** 3
Assessment	

MS3361	Industrial polymerisation processes
Lecturer	Jager, Dingemans
Course Material	
Description	The module illustrates how polymer chemistry and processing fundamentals are applied in the plastics industry. The basics of polymerisation reaction kinetics are summarized (radical, ionic, coordinative and step-growth), the reaction types are listed (emulsion, suspension, solution and bulk polymerisation) and application examples are given for e.g. polyesters, polycarbonates, polyamides and polyurethanes. The commercial polymerisation techniques are discussed: simply 'how to make tons of it'. Combination of polymerisation with shaping techniques are also mentioned: reactive extrusion, reactive injection moulding, but also paints and coatings.
Education	Lecture **EC** 3
Assessment	

MS3371	Recent Developments in Advanced Polymer Science
Lecturer	Several AIO's
Course Material	
Description	The content of this module will vary form year to year, where one or two topics that are of current interest in the field of advanced polymer science will be discussed in depth via self-study, literature survey, student presentations, discussion with PhD students & members of staff etc. Topics may include: physical ageing studies, fluorescent probe molecules, nano-composites, inelastic scattering techniques, liquid crystal devices, confined polymer dynamics.
Education	Lecture **EC** 4
Assessment	

MS3381	Practical characterization & processing
Lecturer	Gotsis, Picken, Mendes
Course Material	
Description	The practical will consist of three modules each lasting 4 full days, the details still have to be worked out but the topics below should give a good indication of what to expect. 1)Characterisation: XRD, Opt. Microscopy, DSC, TGA, HDT 2)Dynamics: DMA, DRS, Simulation MD/MC, chain statistics 3)Applications & processing: Rheology during cure of thermoset, Reaction heat determination, thermal conduction measurement, blend/nano-composite manufacture & evaluation
Education	Lecture **EC** 4
Assessment	

MS3401	Primary metals production
Lecturer	Boom
Course Material	
Description	Raw materials preparation (ores, scrap, recycled material), preparation for reduction (calcination, roasting, agglomeration), reduction of metal oxides, Ellingham diagram, physical fundamentals of liquid metal processing, thermodynamic and kinetic fundamentals of metal reduction and refining, blast furnace process, hot metal treatment, oxygen steelmaking, electric arc steelmaking, alloying and vacuum treatment, ladle furnace, pyrometallurgy (titanium, copper), electrometallurgy (aluminium, magnesium). Inclusion control in steelmaking, general introduction in continuous casting and solidification. Model description and simulation of primary metals production processes.
Education	Lecture **EC** 3
Assessment	

MS3411	Processing of metals
Lecturer	Katgerman
Course Material	
Description	Transport phenomena in metals processing. Fundamentals and building blocks for process models. Numerical approximation methods. Relation between process conditions during metal production and process performance. Microstructure evolution. Selected case studies.
Education	Lecture **EC** 6
Assessment	

MS3421	Developments in production and processing
Lecturer	Duszczyk
Course Material	
Description	Powdermetallurgy: Production of metal powders, atomisation, Osprey-deposition, particle distributions. Shaping by compaction, powder spray casting, sintering. Extrusion of powder billets, hot isostatic pressing (HIP). Intermetallic compounds. Composites: metal matrix composites, fibre reinforced materials, laminates. Amorphous and nanocrystalline materials: mechanical alloying, ball milling, rapid solidification processing (RSP).
Education	Lecture **EC** 2
Assessment	

MS3431	Determination of microstructure
Lecturer	Sloof
Course Material	
Description	Characterisation and analysis of the microstructure of materials, i.e. grain structure, texture, interfaces and composition. Includes practicals for the course "Performance of metals", see below.
Education	Lecture **EC** 4
Assessment	

MS3441	Relation between properties and microstructure
Lecturer	Sietsma
Course Material	
Description	Relation between (mechanical) properties and microstructural details as grain size and shape, texture and lattice defects (in particular dislocations). Movement of and interaction between dislocations, strengthening by dislocation production during deformation, interaction between dislocations and inclusions and inhomogeneities (grain boundaries, precipitates, dissolved atoms), non-uniform plastic deformation, creep. Diffusional transformations in steel and its applications in steel production.
Education	Lecture **EC** 5
Assessment	

MS3441TU	Physics and Technology of Thin Films
Lecturer	Böttger, G. Janssen, Wübbenhorst
Course Material	
Description	The preparation methods, structure and properties of thin films will be treated in this module, focussing on a range of applications based on different properties (mechanical, optical, magnetic, transport properties). Both the fundamental and technological aspects of thin films will be highlighted.
Education	Lecture **EC** 4
Assessment	

MS3451	Total performance approach; case studies
Lecturer	Katgerman
Course Material	
Description	Materials and process selection Materials and process selection for industrial applications. Systematic implementation for multiple criteria and multiple design elements for selected case studies. Case studies on design of materials and designs using materials Deterministic considerations, dimensioning for dynamic loading, safety assessment using fracture mechanics, reliability, reliability and life expectancy tests, case studies.
Education	Lecture **EC** 4
Assessment	

MS3461	Corrosion and protection against corrosion
Lecturer	de Wit
Course Material	
Description	Relevance of corrosion, electrochemical corrosion and its manifestations, corrosion prevention and protection.
Education	Lecture **EC** 3
Assessment	

MS3471	Welding engineering and Non-Destructive Testing
Lecturer	Richardson
Course Material	
Description	Physical principles of welding processes, the influence of welding on local material structures and resultant properties, factors influencing defect formation and the significance of failure. Survey of NDT techniques (radiography, ultra-sonic testing), NDT under special conditions, the physical principles, techniques, possibilities, drawbacks and applications.
Education	Lecture **EC** 3
Assessment	

MT816	Composite Materials for Ship Construction
Lecturer	
Course Material	
Description	The course aims primarily at the possibilities and limitations of fibre reinforced plastics (FRP's) in ship structures. The pros and cons of FRP's with respect to conventional materials are discussed and related to current applications. Fabrication, supply and properties are dis-cussed with respect to basic components (matrix, reinforcement and core material) as well as with respect to the final product (laminate and sandwich). The course deals with the relevant production methods and structural concepts of maritime structures and structural components. Special attention is given to the effect of structural design concept and of composition and properties of material components on the response and capability.
Education	**EC** 2
Assessment	

TA4300	Production and Recycling
Lecturer	Reuter
Course Material	
Description	This module is aimed at increasing the understanding of the production and waste management of materials in both a cost-efficient and environmentally responsible way. The subjects covered in the module are resource engineering, categories of raw materials, cycles and industrial ecology, separation and metallurgical processes, technology for recycling and plant layout by example, system analysis of material cycles, potentials and limits.
Education	Lecture **EC** 3
Assessment	

WB1430a	Composite Materials for Durable Structures
Lecturer	
Course Material	
Description	Introduction to fibre reinforced plastics. Functions of fibres and plastic. Mechanical proper-ties, weight saving, raw materials and intermediates. Thermosets and thermoplastics, processing to final products. Applications. Recycling and other environmental aspects. Reinforcement efficiency of fibres plates and spheres. Adhesion. Critical and effective fibre length. Costs and cost estimations. Interlaminar edge stress fields. Laminating rules. 2-dimensional anisotropy.
Education	**EC** 3
Assessment	

WB1430B	Fibre Reinforced Plastics, extended course
Lecturer	
Course Material	
Description	Introduction to fracture mechanics and application on composites and other advanced materi-als, possibilities and restrictions. Experimental techniques for testing of composites. Intro-duction Weibull statistics for strength, possibilities and restrictions. Introduction to polymer science, film formation. Theoretical material strength and strength of advanced polymer fibres. Fatigue of composites. Compression strength of composites. Failure behaviour of natural materials (bone and wood) Stress concentrations in isotropic and anisotropic plates. Notch size effect on the fracture strength of composites
Education	**EC** 6
Assessment	

WB1432	Mechanics of Fibre Reinforced Plastics
Lecturer	
Course Material	
Description	Application of continuum mechanics of homogeneous anisotropic materials in case of composite materials like fibre reinforced plastics. Hygrothermal effects. Relation between stiffness and strength of components and composite. Failure criteria. Laminate theory. First Ply Failure. Interlaminar edge stresses, influence on stacking sequence. Viscoelasticity and fatigue of laminates.
Education	**EC** 4
Assessment	

WM0517TU	Strategic Business Management
Lecturer	Van der Duin, Den Hartigh, Zegveld
Course Material	
Description	The subject of strategic management for business focuses on the way in which companies formulate their mission and goals, and addresses current issues with which businesses must contend. Strategy concerns the developments that business wishes to make together with the associated goals that they wish to achieve. This necessitates consideration of their own vision (present and future) and an analysis of core competencies, together with an analysis of the external drivers and the boundary conditions within which business must operate.
Education	Lecture **EC** 6
Assessment	

WM0621tu	Managing Innovation
Lecturer	Kleinknecht
Course Material	
Description	Under development.
Education	Lecture **EC** 3
Assessment	

WM0710TU	Technology and Society
Lecturer	Kroesen, Wiersma
Course Material	
Description	The course comprises four main topics: 1) Management and Organisation: The organisation structures in an organisation and the dynamics of change from one organisational form to another will be highlighted. 2) Economics: Some basic concepts of economics will be explained, such as engineers might be confronted with in their jobs and in business relationships. 3) Safety Science: The students will learn how to make a fault-tree and a sequence analysis. Special emphasis will be put on the human factor. 4) Ethics: The students will learn to differentiate between professional, functional, collective and personal (or vacant) responsibility.
Education	Lecture **EC** 6
Assessment	

	Patentrecht
Lecturer	
Course Material	
Description	Under development
Education	Lecture **EC** 3
Assessment	

Appendices

6.1 Course and Examination Regulations

(DRAFT JUNE 2004)

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 Materials Science and Engineering at Delft University of Technology, hereafter referred to as the programme.
2. This programme is 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 "extraneus") 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:
   - writing a thesis;
   - writing a paper/completing an assignment, project or technological design;
   - completing a design or research assignment;
   - conducting literature study;
   - completing a work placement;
   - taking part in fieldwork or an excursion;
   - conducting tests and experiments;
   - or participating in another educational activity focused on the attainment of a particular skill.

e.	interim examination:	a test of a student's knowledge, insight and skills with regard to a particular unit of study, and the assessment of this examination by at least one examiner appointed for that task by the board of examiners.
f.	examination:	test used by the board of examiners to establish whether all interim examinations that are part of the study programme have been successfully completed as specified in Article 7.10 of the Act.
g.	board of examiners:	the board of examiners as appointed according to Article 7.12 of the Act.
h.	implementation procedures:	the implementation procedures integral to the Course and Examination Regulations and applicable to a specific Master's programme.
i.	working day:	each day from Monday to Friday, with the exclusion of official national holidays.
j.	course calendar:	the publication containing all the specific information appropriate to a specific Master's course guide named in Article 1.
k.	examiner:	those appointed by the board of examiners for the purpose of taking interim examinations in accordance with Article 7.12 of the Act;
l.	EC:	European Credits as specified in the European Credit Transfer System
m.	The University:	Delft University of Technology

Article 3 OBJECTIVE OF THE MASTER'S PROGRAMME MATERIALS SCIENCE AND ENGINEERING

This Master's programme is intended to prepare graduates in Materials Science and Engineering to apply scientific and engineering skills at an academic level,

- capable to identify, define and analyse problems, for the solution of which materials science and engineering principles and techniques can contribute
- capable to systematically design and produce a sound solution to the problem
- capable to identify possibilities to improve existing materials and their applications in terms of production, properties and understanding of the materials
- capable to conduct interdisciplinary goal-oriented basic research on materials of technological importance
- capable to present the obtained results 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 Applied Physics with the minor programme Materials Science and Engineering 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 MATERIALS SCIENCE AND ENGINEERING

The Master's programme Materials Science and Engineering has the following exit qualifications:
Graduates will:

- have broad and active knowledge of the basic applied sciences
- have broad basic technical and scientific knowledge of the production, the structure and the properties of materials
- be aware of the challenges and developments in a number of fields of materials science and engineering
- be specialized in at least one discipline in the field of materials science and engineering
- be able to contribute to solving multidisciplinary problems and to work both in multidisciplinary teams and independently in an international industrial or academic context
- be capable to conduct experimental, theoretical, and/or computational research on materials of technological importance
- be able to communicate effectively with team members, environment, and scientific colleagues
- be capable to contribute significantly to a scientific paper or an in-depth technological report
- 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. Each student with a physical or sensory disability shall be given the opportunity to take all interim examinations and practical training in a way that, to the greatest possible extent, is adapted to the disability in question. Under this facility, the form or length of the interim examinations shall be adapted to the individual situation, or practical aids shall be made available.
4. The facilities specified in the previous paragraph should be requested from the board of examiners by the student concerned. This request should be accompanied by a medical certificate issued no more than one year previously by a doctor, psychologist or student counsellor. All requests involving dyslexia should be backed by a recognised dyslexia testing body.

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 Materials Science and Engineering

Article 1 COURSE CALENDAR

The course calendar for the programme can be found in the Study Guide for the Master's degree programme Materials Science and Engineering.

Article 2 COMPOSITION OF THE PROGRAMME

The composition of the Master's degree programme Materials Science and Engineering, 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 Materials Science and Engineering MSc-programme is provided in 6 variants:
   - Metals Science and Technology
   - Applied Functional Polymers
   - Materials for Art and Archaeology
   - High Performance Materials in Structural Applications
   - Materials for Energy and Environment
   - Management of Technology

2. As an addition to the variant programme there is an annotation that can be assigned. If the requirements for the annotation are fulfilled, the student acquires a supplement to the MSc-degree, which declares a more than average knwoledge about that subject. The annotation is for:
   - Technology in Sustainable Development.
3. Further details and requirements are 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.

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 Materials Science and Engineering, 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 three examiners 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 research group responsible for the specialisation concerned; no less than one member belongs to the scientific staff of a different research group 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 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 can items such as briefcases, bags and communication equipment 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 examiner has given prior permission for this.

14 During the interim examination, candidates may not consult books, readers, etc., unless the examiner 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[1], 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.

[1] Course and Examination Regulations

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.

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. The applicable reader or textbook should ultimately be available at the start of 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.

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[2]

1 The votes of the board of examiners shall be established by a simple majority of votes.

2 If the votes are equally divided, the chair of the board of examiners shall have the casting vote, unless the vote takes place in writing.

3 If, in a written vote, the votes are equally divided, there shall be a second ballot. If this, too, leads to an equal division of votes, the proposal being balloted shall be rejected.

Article 12 CUM LAUDE

1 At the discretion of the board of examiners, a candidate for the Master's degree can receive the designation "cum laude" if he or she meets the following conditions:
   - a the mark awarded to the components specified in the Master's examination implementation procedures, excluding the mark awarded for the Master's thesis project, shall average no less than 8 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.

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

Article 13 MASTER'S DEGREE CERTIFICATES AND STATEMENTS

1 To establish that a candidate has satisfied the examiners in the Master's examinations, the board of examiners shall issue a degree certificate. This shall be signed by the chair and the secretary to the board of examiners.

2 a The degree certificate as intended under paragraph 1 shall list the specific components of the examination, and, where appropriate, the competencies associated with them.

b The degree certificate shall be accompanied by marks lists in both Dutch and English.

3 If a candidate's performance during the examinations testifies to exceptional abilities, the board of examiners can, under the conditions stated in Article 11 of these Regulations, decide to grant the designation "cum laude" on the degree certificate.

4 Any student who has successfully completed one or more interim examinations and to whom, upon his or her leaving the university, a degree certificate as intended in paragraph 1 of this Article cannot be awarded, shall, upon his or her request, receive a statement from the board of examiners in question.

Article 14 PROCEDURE FOR APPROVALS

1 Any student wishing to submit a request as intended under Article 7.3 paragraph 4 of the WHW (i.e. with regard to a flexible study programme) should do so on a timely basis, ensuring that, by all reasonable definitions, there is time for approval to be given before he or she takes the first interim examination. In this, he or she should take full account of the period within which the board of examiners is entitled to decide (see Article 14, paragraph 1). The request shall be accompanied by a clearly argued motivation, and, if necessary, by material that supports it.

2 Students shall submit to the board of examiners any requests for exemption from an interim examination or practical exercise as intended under Article 17 of the CER. The board of examiners shall decide on this after taking advice from the student counsellor. The periods within which decisions shall be taken are defined in Article 14, paragraph 2 of these Regulations and Guidelines.

3 If a student wishes to depart from the teaching programme prescribed in the implementation procedures, he or she shall submit a request to this effect, ensuring that, by all reasonable definitions, there is time for approval to be given before the date of the first interim examination that deviates from that programme. In this, full account should be taken of the period within which the board of examiners is entitled to decide (see Article 13, paragraph 1).

4 A decision to withhold approval for a request of the type intended under paragraphs 1, 2 and 3 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 14, 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.

6.4 Lecturers

Name	Tel[1]	E-Mail	Room	Building[2]
Andriessen, prof. dr. J.H.T.H.	81742	J.H.T.H.Andriessen@tbm.tudelft.nl	a0.350	TBM
Bakker, prof. dr. ir. A.	85418	A.Bakker@tnw.tudelft.nl	1.71	TM
Boom, prof. dr. R.	82214	R.Boom@tnw.tudelft.nl	0.62	TM
Böttger, mw. dr. A.J.	82243	A.J.Bottger@tnw.tudelft.nl	2.48	TM
Delhez, dr. ir. R.	82261	R.Delhez@tnw.tudelft.nl	2.63	TM
Dicke, mw. dr. W.M.	83433	W.Dicke@tbm.tudelft.nl	b3.310	TBM
Dik, dr. J.	89571	J.Dik@tnw.tudelft.nl	2.13	TM
Dingemans, Th. J.	84520	Th.J.Dingemans@lr.tudelft.nl	1.34	LR
Duin, drs. P.A. van der	81146	P.vanderDuin@tbm.tudelft.nl	c2.170	TBM
Duszczyk, dr. ir. J.	82218	J.Duszczyk@tnw.tudelft.nl	0.95	TM
Goossens, dr. A.P.L.M.	84919	A.P.L.M.Goossens@tnw.tudelft.nl	1.207	DCT
Gotsis, dr. A.D.	84360	A.D.Gotsis@tnw.tudelft.nl	0.330	DCT
Hartigh, drs. E. den	83565	E.denHartigh@tbm.tudelft.nl	c2.150	TBM
Hermans, dr. ir. M.J.M.	82286	M.J.M.Hermans@tnw.tudelft.nl	1.77	TM
Jager, dr. W.F.	82626	W.F.Jager@tnw.tudelft.nl	0.313	DCT
Janssen, dr. G.C.A.M.	81684	G.C.A.M.Janssen@tnw.tudelft.nl	2.23	TM
Janssen, dr. ir. M.	85866	M.Janssen@tnw.tudelft.nl	1.74	TM
Katgerman, prof. ir. L.	82249	L.Katgerman@tnw.tudelft.nl	0.58	TM
Kearley, G.J.	81306	G.J.Kearley@iri.tudelft.nl	2 01 140	IRI
Kleinknecht, prof. dr. A.H.	83469	A.Kleinknecht@tbm.tudelft.nl	c2.090	TBM
Krol, R. van de	82659	R.vandeKrol@tnw.tudelft.nl	0.242	DCT
Kroessen, J.O.	85262	J.O.Kroessen@tbm.tudelft.nl	b3.280	TBM
Mendes, dr. E.	82623	E.Mendes@tnw.tudelft.nl	0.302	DCT
Picken, prof. dr. S.J.	86946	S.J.Picken@tnw.tudelft.nl	0.027	DCT
Reuter, prof. ir. M.A.	82903	M.A.Reuter@citg.tudelft.nl	141	TA
Richardson, prof. dr. I.M.	85068	I.M.Richardson@tnw.tudelft.nl	1.81	TM
Sietsma, dr. ir. J.	82284	J.Sietsma@tnw.tudelft.nl	1.28	TM
Sloof, dr. ir. W.G.	84924	W.G.Sloof@tnw.tudelft.nl	1.36	TM
Thijsse, prof. dr. B.J.	82221	B.J.Thijsse@tnw.tudelft.nl	2.21	TM
Wit, prof. dr. J.H.W. de	82196	J.H.W.deWit@tnw.tudelft.nl	1.56	TM
Wissema, prof. dr. ir. J.G.	82035	J.G.Wissema@tbm.tudelft.nl	c2.130	TBM
Wübbenhorst, dr. M.R.	86940	M.R.Wubbenhorst@tnw.tudelft.nl	0.332	DCT
Zandbergen, prof. dr. H.W.	82266	H.W.Zandbergen@tnw.tudelft.nl	2.39	TM
Zegveld, dr. ing. M.A.	84711	M.A.Zegveld@tbm.tudelft.nl	c2.100	TBM
Zhou, dr. J.	85357	J.Zhou@tnw.tudelft.nl	0.92	TM

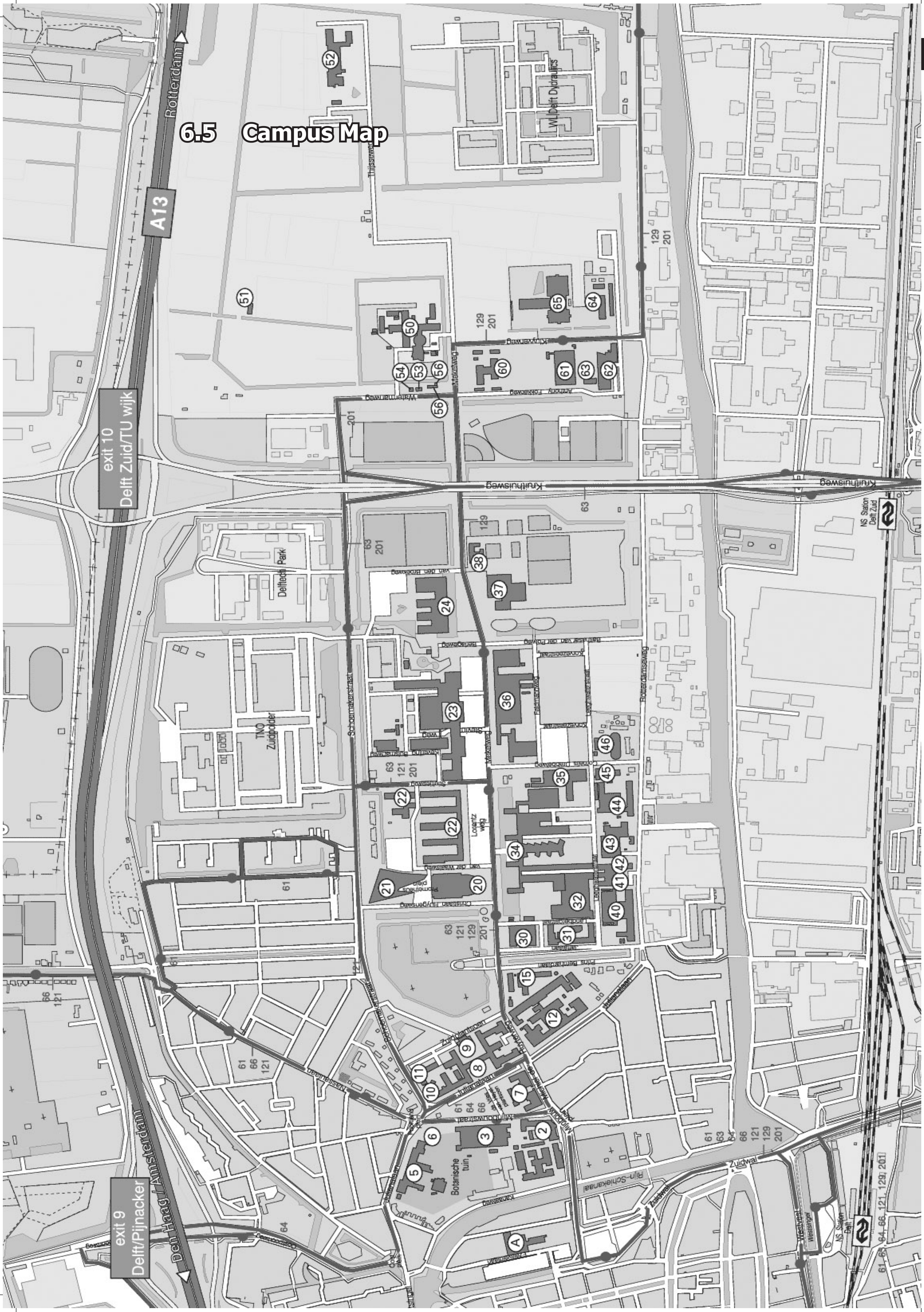
For other phone numbers the student can call the universal TU number (015 27 89111) or the reception of the faculty (015 27 86666)

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

2

API:	Leeghwaterstraat 44, 2628 CA Delft	TBM:	Jaffalaan 5, 2628 BX Delft
CiTG:	Stevinweg 1, 2628 CN, Delft	TNW:	Lorentzweg 1, 2628 CJ Delft
IO:	Landberghstraat 15, 2628 CE Delft	TM:	Rotterdamseweg 137, 2628 AL Delft
ITS-et:	Mekelweg 4, 2628 CD Delft	WbMT:	Mekelweg 2, 2628 CD Delft
IRI:	Mekelweg 15, 2629 JB Delft	DCT:	Julianalaan 136, 2628 BL Delft
LR:	Kluyverweg 1, 2629 HS Delft	TA:	Mijnbouwstraat 120, 2628 RX Delft

6.5 Campus Map



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 adresses 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.

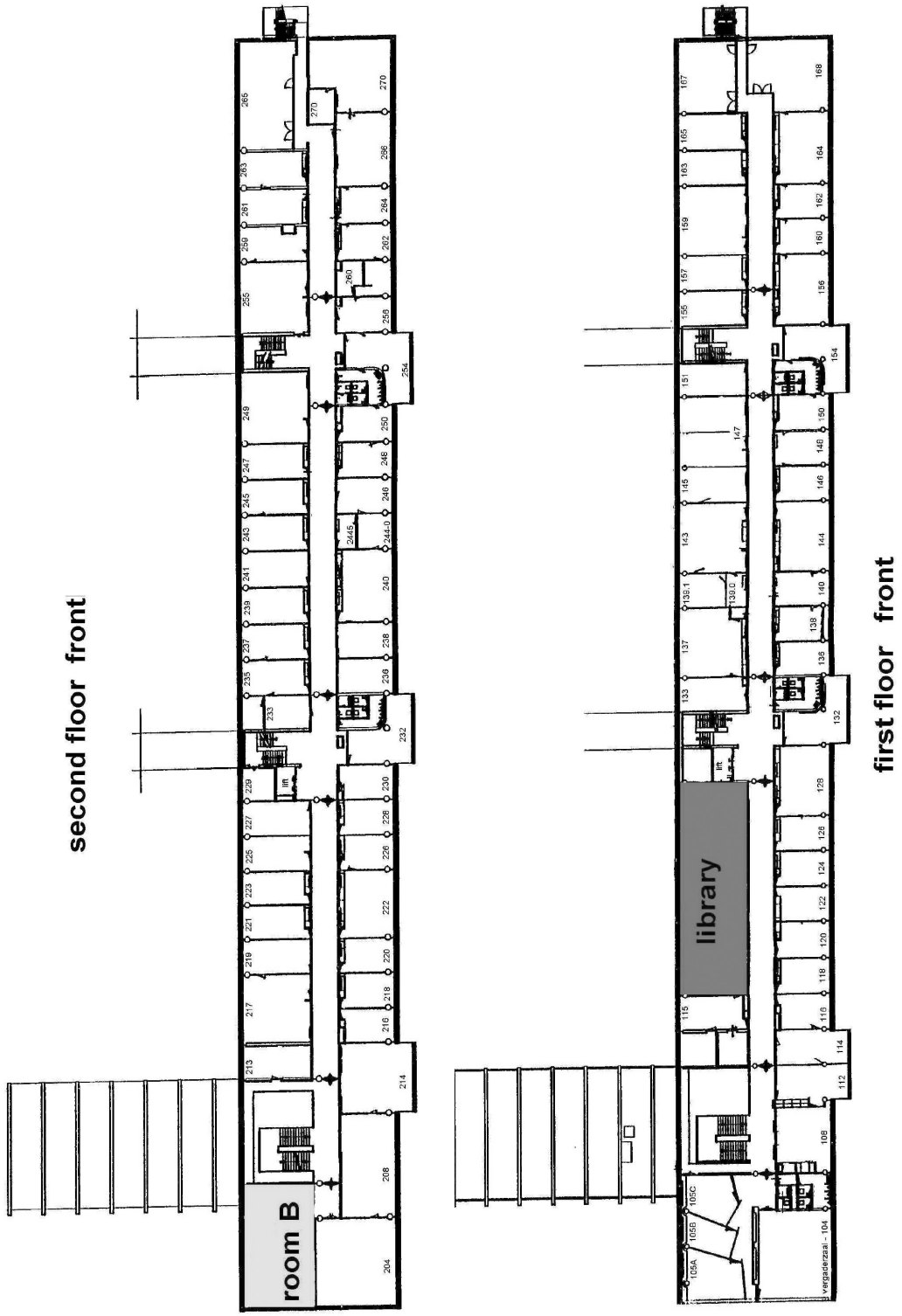
1A WK 36-42	COURSE SCHEDULE MSC MATERIALS SCIENCE & ENGINEERING SEMESTER 1A							
	Generic Course		Topical AFP		Topical MST		Topical MoT	
	course	code	course	code	course	code	course	code
Day/hours	lecturer	room	lecturer	room	lecturer	room	lecturer	room
mon 1,2 0830-1030	Metals Science	MS3021						
	Richardson	40C						
mon 3,4 1030-1230	Mechanical Properties	CE4031MS						
	M. Janssen	40C						
mon 5,6 1330-1530	Semicond. Dev. & Magn.	MS3011	Pract. Char. & Pross.	MS3381				
	Thijsse	40B	Gotsis, Picken, Mendes	DCT				
mon 7,8 1530-1730			Pract. Char. & Pross.	MS3381				
			Gotsis, Picken, Mendes	DCT				
tue 1,2 0830-1030	Polymer Science	CE4011MS	Pol. Dyn. & Modelling II	MS3321	Rel. props./microstr.	MS3341	Managing Innov.	WM0621TU
	Picken	40A	Kearly, Mendes	40C	Sietsema	40-249	Kleinknecht	
tue 3,4 1030-1230	Ceramics Science	CE4021MS	Adv. Pol. Appl. II	MS3341	TPA; Case studies	MS3451		
	Goossens	40A	Mendes, Wuebbenhorst	40c	Katgerman, Zuidema	40-249		
tue 5,6 1330-1530								
tue 7,8 1530-1730								
wed 1,2 0830-1030	Semicond. Dev. & Magn.	MS3011	Rec. Dev. In APS	MS3371	Corrosion & ...	MS3461		
	Thijsse	40-195	Several AIO's	40-249	De Wit	40B		
wed 3,4 1030-1230	Metals Science	MS3021	Pol. Dyn. & Modelling II	MS3321	Corrosion & ...	MS3461		
	Richardson	40A	Kearly, Mendes	40C	De Wit	40B		
wed 5,6 1330-1530								
wed 7,8 1530-1730								
thur 1,2 0830-1030	Mechanical Properties	CE4031MS	Rec. Dev. In APS	MS3371	TPA; Case studies	MS3451		
	M. Janssen	40-249	Several AIO's	40B	Katgerman, Zuidema	40C		
thur 3,4 1030-1230	Polymer Science	CE4011MS	Rec. Dev. In APS	MS3371	Rel. props./microstr.	MS3441		
	Picken	40-249	Several AIO's	40B	Sietsema	40C		
thur 5,6 1330-1530			Adv. Pol. Appl. II	MS3341	Devel. Prod. & Pross	MS3421		
			Mendes, Wuebbenhorst	40B (on	Duszczyk	40C		
thur 7,8 1530-1730					Idem 7th			
fri 1,2 0830-1030	Ceramics Science	CE4021MS	Pract. Char. & Pross.	MS3381	Rel. props./microstr.	MS3441		
	Goossens	40-249	Gotsis, Picken, Mendes	DCT	Sietsema	40C		
fri 3,4 1030-1230	Metals Science	MS3021	Pract. Char. & Pross.	MS3381				
	Richardson	40C	Gotsis, Picken, Mendes	DCT				
fri 5,6 1330-1530								
fri 7,8 1530-1730								

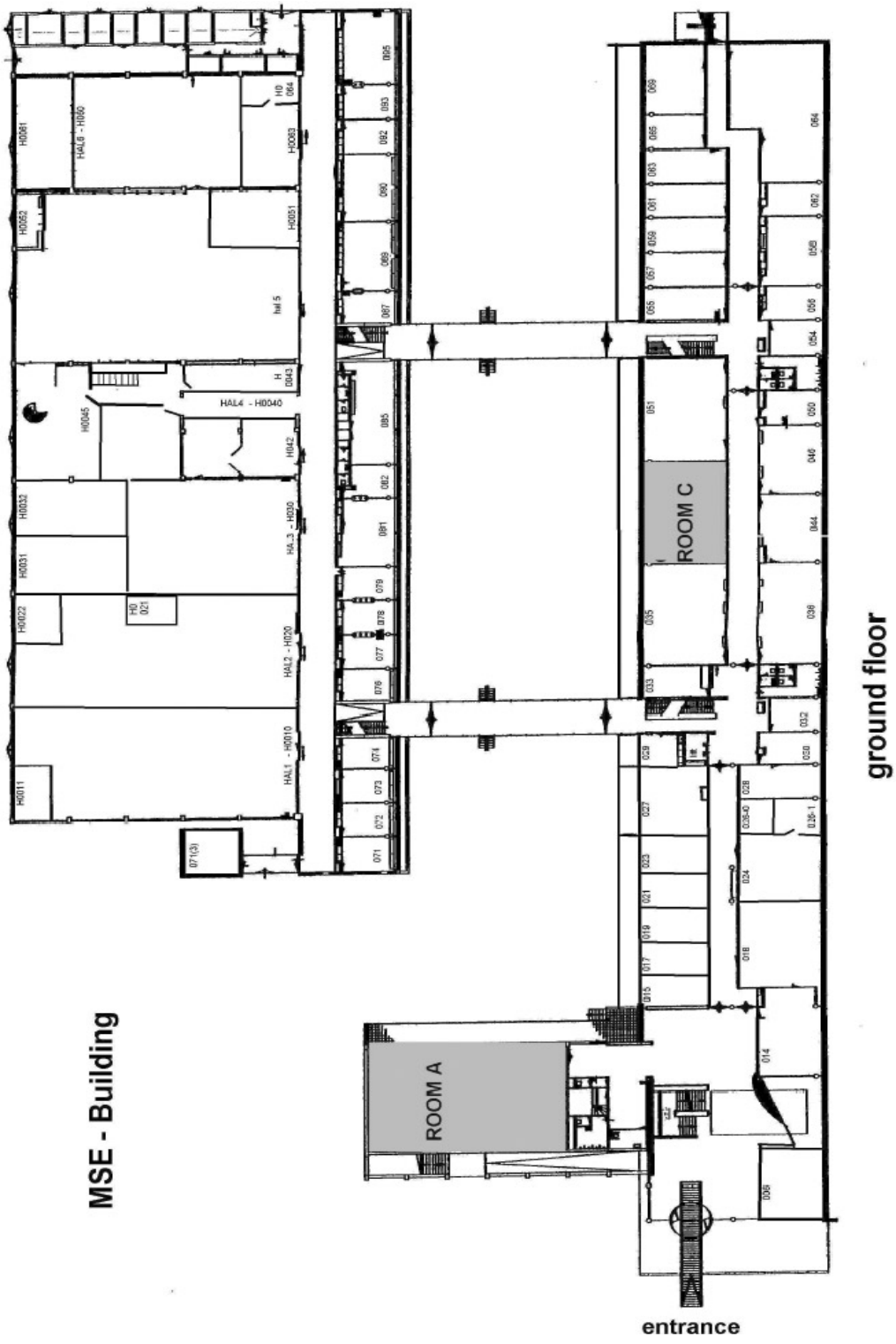
1B WK 45-51	COURSE SCHEDULE MSC MATERIALS SCIENCE & ENGINEERING SEMESTER 1B							
	Generic Course		Topical AFP		Topical MST		Topical MoT	
	course	code	course	code	course	code	course	code
Day/hours	lecturer	room	lecturer	room	lecturer	room	lecturer	room
mon 1,2 0830-1030	Metals Science	MS3021					Knowledge and R&D Manag.	MOT2420
	Richardson	40C					Andriessen	
mon 3,4 1030-1230	Mechanical Properties	CE4031MS					Knowledge and R&D Manag.	MOT2420
	M. Janssen	40C					Andriessen	
mon 5,6 1330-1530	Semicond. Dev. & Magn.	MS3011						
	Thijsse	40B						
mon 7,8 1530-1730								
tue 1,2 0830-1030	Polymer Science	CE4011MS					Managing Innov.	WM0621TU
	Picken	40C					Kleinknecht	
tue 3,4 1030-1230	Ceramics Science	CE4021MS						
	Goossens	40C						
tue 5,6 1330-1530								
tue 7,8 1530-1730								
wed 1,2 0830-1030	Semicond. Dev. & Magn.	MS3011						
	Thijsse	40B						
wed 3,4 1030-1230	Metals Science	MS3021						
	Richardson	40B						
wed 5,6 1330-1530								
wed 7,8 1530-1730								
thur 1,2 0830-1030	Mechanical Properties	CE4031MS						
	M. Janssen	40C						
thur 3,4 1030-1230	Polymer Science	CE4011MS						
	Picken	40C						
thur 5,6 1330-1530	Metals Science (*)	MS3021						
	Richardson							
thur 7,8 1530-1730	Metals Science (*)	MS3021						
	Richardson							
fri 1,2 0830-1030	Ceramics Science	CE4021MS						
	Goossens	40C						
fri 3,4 1030-1230	Metals Science	MS3021						
	Richardson	40C						
fri 5,6 1330-1530								
fri 7,8 1530-1730								

2A WK 5-11	COURSE SCHEDULE MSC MATERIALS SCIENCE & ENGINEERING SEMESTER 2A							
	Generic Course		Topical AFP		Topical MST		Topical MoT	
	course	code	course	code	course	code	course	code
Day/hours	lecturer	room	lecturer	room	lecturer	room	lecturer	room
mon 1,2 0830-1030								
mon 3,4 1030-1230			Polymer Dyn. & Modelling I	MS3311	Welding & NDT	MS3471		
			Wuebbenhorst, Gotsis	40c	Richardson	40-249		
mon 5,6 1330-1530	Prod. & Recycling	TA4300						
	Reuter	40C						
mon 7,8 1530-1730							Strat. Manag. of coorp.	WM0517TU
							Wissema	
tue 1,2 0830-1030			Polymer Dyn. & Modelling I	MS3311	Welding & NDT	MS3471		
			Wuebbenhorst, Gotsis	40C	Richardson	40-249		
tue 3,4 1030-1230	Thin Films	MS3551TU						
	Bottger	40B						
tue 5,6 1330-1530	Comp. Mat. Sc.	MS3031						
	Thijsse	40B						
tue 7,8 1530-1730								
wed 1,2 0830-1030	Char. Techniques	MS3041						
	Zandbergen	40B						
wed 3,4 1030-1230	Thin Films	MS3551TU						
	Bottger	40B						
wed 5,6 1330-1530	Comp. Mat. Sc.	MS3031						
	Thijsse	40B						
wed 7,8 1530-1730								
thur 1,2 0830-1030	Char. Techniques	MS3041						
	Sloof	40C						
thur 3,4 1030-1230	Prod. & Recycling	TA4300						
	Reuter	40C						
thur 5,6 1330-1530	Comp. Mat. Sc.	MS3031						
	Thijsse	40B						
thur 7,8 1530-1730								
fri 1,2 0830-1030								
fri 3,4 1030-1230	Thin Films	MS3551TU						
	Bottger	40B						
fri 5,6 1330-1530								
fri 7,8 1530-1730								

2B WK 14-21	COURSE SCHEDULE MSC MATERIALS SCIENCE & ENGINEERING SEMESTER 2B							
	Generic Course		Topical AFP		Topical MST		Topical MoT	
	course	code	course	code	course	code	course	code
Day/hours	lecturer	room	lecturer	room	lecturer	room	lecturer	room
mon 1,2 0830-1030			Str. Form. & Char.	MS3301	Determ. of Microstr.	MS3431		
			Picken, Jager	40C	Sloof	40B		
mon 3,4 1030-1230	Nano & Bio Mat.	MS3051						
	Zandbergen	40B						
mon 5,6 1330-1530					Processing of Metals	MS3411		
					Katgerma	40C		
mon 7,8 1530-1730								
tue 1,2 0830-1030			Adv. Pol. Appl. I	MS3331	Primary Metals Prod.	MS3401		
			Gotsis, Picken	40B	Boom	40-249		
tue 3,4 1030-1230			Polymer Processing	MS3351	Primary Metals Prod.	MS3401		
			Gotsis	40B	Boom	40-249		
tue 5,6 1330-1530			Str. Form. & Char.	MS3301	Processing of Metals	MS3411		
			Picken, Jager	40B	Katgerma	40C		
tue 7,8 1530-1730								
wed 1,2 0830-1030	Nano & Bio Mat.	MS3051						
	Zandbergen	40B						
wed 3,4 1030-1230			Str. Form. & Char.	MS3301	Determ. of Microstr.	MS3431		
			Picken, Jager	40C	Sloof	40B		
wed 5,6 1330-1530								
wed 7,8 1530-1730								
thur 1,2 0830-1030			Industr. Pol. Pross.	MS3361	Processing of Metals	MS3411		
			Jager, Dingeman	40B	Katgerma	40C		
thur 3,4 1030-1230			Polymer Processing	MS3351	Processing of Metals	MS3411		
			Gotsis	40B	Katgerma	40C		
thur 5,6 1330-1530								
thur 7,8 1530-1730								
fri 1,2 0830-1030			Adv. Pol. Appl. I	MS3331	Determ. of Microstr.	MS3431		
			Gotsis, Picken	40B	Sloof	40C		
fri 3,4 1030-1230			Industr. Pol. Pross.	MS3361	Processing of Metals	MS3411		
			Jager, Dingeman	40B	Katgerma	40C		
fri 5,6 1330-1530								
fri 7,8 1530-1730								

6.7 MSE Building




MSE - Building
ground floor
ROOM A
ROOM C
entrance