TEACHING AND EXAMINATION REGULATIONS

(OER)

(from Article 7.13 of the Higher Education and Research Act)

MASTER'S DEGREE PROGRAMME

MECHANICAL ENGINEERING

DELFT UNIVERSITY OF TECHNOLOGY

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Paragraph 1 - General

Article 1 – Applicability of the regulations

1. These regulations apply to the teaching and examinations of the Master's programme Mechanical Engineering, hereinafter referred to as 'the programme'.

2. The programme is provided under the responsibility of the faculty Mechanical, Marine and Materials Engineering of Delft University of Technology, hereinafter referred to as the faculty.

Article 2 - Concepts

1. The following concepts apply in this Regulation:

a. first academic year: the first period in the programme with a study load of 60 credits, as specified in Article 7.8b Section 8 of the Act;

b. degree audit: the test, in which, in accordance with Article 7.10 of the Act, the Board of Examiners determines whether all examinations in the subjects of the degree programme have been successfully completed;

c. negative binding recommendation on continuation of studies: the rejection linked to the recommendation on the continuation of studies at the end of the first year of enrolment as specified in Article 7.8b Section 3, first sentence;

d. programme: the Master's degree programme, as stipulated in Article 7.3a, Section 1, Subsection a in the Act;

e. Osiris: the education information system;

f. practical exercise: subject of component of a subject aimed at the acquisition of particular skills. The following can be understood as practical exercises:
- writing a thesis,
- conducting a project or experimental design,
- carrying out a project or a design/research assignment,
- completing an internship,
- participating in field work or an excursion,
- conducting tests and experiments, or
- participating in other educational activities that are considered essential and that are aimed at acquiring particular skills;

g. bridging programme: a deficiency programme aimed at moving up to a Master's degree programme, as stipulated in Article 7.30e or Article 7.57i of the Act;

h. student: a person enrolled at Delft University of Technology in order to receive education and take the examinations and the degree audit in the degree programme;

i. credit: credit in accordance with the European Credit Transfer System (ECTS); one credit equals a study load of 28 hours;

j. study guide: the digital guide for the degree programme containing specific information on the subjects included in the degree programme (www.studiegids.tudelft.nl);

k. examination: investigation of the student's knowledge, insight and skills with regard to a subject, along with the assessment of that investigation;

l. track: major, as stipulated in Article 7.13, Section 2, Subsection b of the Act;

m. subject: a unit of study within the programme, as stipulated in Article 7.3, Sections 2 and 3 of the Act with which an examination is associated;

n. working day: Monday through Friday, with the exception of recognised holidays and the collective closure days;

o. Act: the Higher Education and Scientific Research Act (abbreviated to WHW), Bulletin of Acts and Decrees 593 and any amendments since its introduction.

2. The other concepts in these regulations are used in the sense in which they appear in the Act.

3. In these regulations, the term 'examination' also refers to 'interim examination', with the exception of Articles 19, 22 and 25.

Paragraph 2 - Admission and prior education

Article 3- Admission to the Master's degree programme (Art. 7.30b WHW)

ONLY FOR MASTER'S DEGREE PROGRAMMES

BoS advisory powers; SC advisory powers 2018-2019 (amendment RIB)

1. Individuals holding one of the following degrees have access to the education of the Master's degree programme in Mechanical Engineering on the condition that all of the stated requirements have been met.

   a. Specific university Bachelor's degree

   - Bachelor's degree in Mechanical Engineering and Aerospace Engineering.

   b. Other university Bachelor's degree (not including those listed in Subsection a)

   The following applies to this category:

   Successful completion of the stated bridging programme for admission to the Master's degree programme:

   - University Bachelor's degree Civil Engineering, Electrical Engineering, Industrial design, Marine Technology, Molecular Sciences and Technology, Clinical Technology, Applied Physics.

   Bridging programme to be followed:

COURSE CODE	COURSE NAME	ECTS
For Bachelors Civil Engineering		
WB2542 T2 S	Warmteoverdracht	3
WB2543	Process Engineering and Thermodynamics	6
WB3240	Systeem- en Regeltechniek	6
For Bachelors Electrical Engineering		
WB2630	Advanced Mechanics	6
WB2632	Mechanica Project	6
WB2542	Stroming en Warmte	6
WB2543	Process Engineering and Thermodynamics	6
WB2330	Materiaalkunde	6
For Bachelors Industrial Design		
WB2630	Advanced Mechanics	6
WB2631 T2 S	FEM	1
WI1808TH1	Lin. Algebra 1 TH	3
WI2048WBMT	Wiskunde 3 - Analyse en Differentiaalvergelijkingen	6
WB2542	Stroming en Warmte	6
WB2543	Process Engineering and Thermodynamics	6
WB3240	Systeem- en Regeltechniek	6
WI2032TH	Numerieke Wiskunde + practicum	3
For Bachelors Marine Technology		
WB2632 T1 S	Advanced Engineering Design	3
WB2542 T2 S	Warmteoverdracht	3
WB2543 T1 S	Process Engineering and Thermodynamics - theory	3
WB3240	Systeem- en Regeltechniek	6

For bachelors Molecular Sciences and Technology		
WB2630	Advanced Mechanics	6
WB3240	Systeem- en Regeltechniek	6
WB2632 T1 S	Advanced Engineering Design	3
WB2330	Materiaalkunde	6
WI2032TH	Numerieke Wiskunde + practicum	3
For bachelors Clinical Technology		
WB2630	Advanced Mechanics	6
WB2632	Mechanica Project	6
WB2542	Stroming en Warmte	6
WB2543	Process Engineering and Thermodynamics	6
WBMT2048	Wiskunde 3 - Analyse en Differentiaalvergelijkingen	6
WI2032TH	Numerieke Wiskunde + practicum	3
WB2330	Materiaalkunde	6
For Bachelors Applied Physics		
WB2630	Advanced Mechanics	6
WB2632	Mechanica Project	6
WB2543	Process Engineering and Thermodynamics	6
WB3240	Systeem- en Regeltechniek	6
WB2330	Materiaalkunde	6

A bridging programme is completed when all courses are passed with a minimum final mark 6.0

c. Higher professional education degree

The following applies to this category:
Successful completion of the stated bridging programme for admission to the Master's degree programme and, if applicable, the language requirement
- higher professional education degree in Mechanical Engineering, Mechatronics

Bridging programme to be followed:

VAKCODE	VAKNAAM	ECTS
WB2630	Advanced Mechanics	6
WB2631 T2 S	Finite Element Methods	1
WB2542	Stroming en Warmte	6
WB2543 T1 S	Process Engineering and Thermodynamics - tentamen	3
WB3240	Systeem- en Regeltechniek	6
WI1708TH1	Analyse 1 TH	3
WI1708TH2	Analyse 2 TH	3
WI1708TH3	Analyse 3 TH	3
WI1807TH1	Lineaire Algebra 1 voor TH	3
WI1909TH	Differentiaalvergelijkingen TH	3
WI2032TH	Numerieke Wiskunde + practicum	3
		40

A bridging programme is completed when all courses are passed with a minimum final mark 6.0

d. Foreign degree

This category is subject to the general selection requirements of Delft University of Technology with regard to prior foreign education, based on a Cumulative Grade Point Average of at least 75% of the maximum number of points that could be earned, included in the table of countries (see website) and meeting the requirements for satisfactory linguistic mastery of English, as stated in the appendix.

2. Access to the education of the Master's degree programme in Mechanical Engineering is open to individuals who have demonstrated to the admissions committee that they possess knowledge, insight and skills at the level of the Bachelor's degree mentioned Subsections 1a, or of a university Bachelor's degree, in addition to the further requirements mentioned in Subsections 1b and 1c.

Article 4 - University entrance examination (Art. 7.29 Section 2 WHW)
ONLY FOR BACHELOR'S PROGRAMMES
BoS advisory powers

Paragraph 3 - Content and composition of the programme

Article 5 - Goal of the programme (Art. 7.13 Section 2, Subsection c WHW)
BoS right of approval

1. The programme is intended to educate students to earn a Master of Science degree in Mechanical Engineering, providing them with such a level of knowledge, insight and skills in the area of Mechanical Engineering, that graduates can fulfil positions on the labour market at the Master's level.

2. Graduates must also meet the specific final attainment levels for each degree programme, as defined in the appendix.

Article 6 - Track (Art. 7.13 Section 2, Subsection b WHW)
BoStudies right of approval

The Master's degree programme has the following tracks, with the stated content in the appendix:

- Biomechanical Design
- Energy and Process Technology
- High-Tech Engineering
- Opto-Mechatronics
- Transport Engineering and Logistics
- Vehicle Engineering

Article 7 - Composition of the programme and degree audits
(Art. 7.13 Section 2, Subsections a, e and g of the WHW); BoS advisory powers (a); right of approval (e and g)
(Art. 7.13 Section 2, Subsection x WHW; FSCI right of approval, BoS advisory powers

1. The programme includes the Master's degree audit, with a study load of 120 credits.

2. Students following two simultaneous Master's degree programmes at TU Delft must earn at least 60 additional unique credits in addition to a complete Master's degree programme of 120 credits.

3. Subjects that were part of the Bachelor's degree programme that qualified a student for admission to the Master's degree programme may not be included in the Master's degree programme. If a compulsory component has already been completed in the aforementioned Bachelor's degree programme, the Board of Examiners will designate an alternative subject. If an elective module of the degree programme has already been completed in the aforementioned Bachelor's degree programme, the student will select an alternative elective module.

4. The Master's degree audit is concluded with a final test or assignment. This test or assignment demonstrates that the student possesses and is able to apply the knowledge, insight and skills acquired in the degree programme.

5. The degree programme is described in the appendix, along with the subjects, including the study load, number of contact hours and form of examination of each subject, as well as the programming of the examination and the language.

6. The actual design of the education is elaborated in greater detail in the study guide.

Article 8 - Form of the programme (Art. (7.13 Section 2, Subsection i WHW)
FSC right of approval, BoS advisory powers

The programme is offered exclusively as full-time.

Article 9 - Language
FSC right of approval, BoS advisory powers
The teaching is in English, and the examinations are administered in English.

Article 10 – Honours Programme
FSC right of approval, BoS advisory powers

1. Based on the criteria referred to in the Bachelor's Honours Programme, students will be selected and admitted to the Master's Honours Programme by the Honours Coordinator.

2. The Master's Honours Programme comprises at least 20 credits.

   a. At least five credits must be completed in the institution-wide component of the Master's Honours Programme: the subject 'Critical Reflection on Technology', UD2010, and

   b. At least 15 credits must be completed in the faculty component of the Master's Honours Programme, the composition of which (including its content and options) is described in the Honours Programme.

3. All students selected for participation in the Honours Programme must submit their options for the faculty component for approval to the Honours Coordinator.

4. The Board of Examiners will be responsible for assessing whether all the requirements of the Honours Programme have been met.

5. Any student who has successfully completed the Honours Programme will be awarded a certificate signed by the chair of the Board of Examiners and the Rector Magnificus.

Article 11 – (Compulsory) participation in the programme (Art. 7.13 Section 2, Subsection t WHW)
FSC right of approval, BoS advisory powers

1. All students are expected to participate actively in the subjects for which they are registered.

2. If necessary, there will be an obligation to participate in practical exercises, with a view to admission to the related examination, without prejudice to the authority of the Board of Examiners to grant an exemption from this obligation, with or without imposing a substitute requirement.

3. Any supplementary obligations are described by component in the course description.

Article 12 - Programme evaluation (Art. 7.13 Section 2, Subsection a1 WHW)
BoS right of approval

1. The Director of Studies is responsible for the evaluation of the education.
2. The manner in which the education in the programme is evaluated is documented in the Quality Assurance Manual of 3mE, which is submitted for advice to the Faculty Student Council and the Board of Studies.
3. The Director of Studies informs the Board of Studies concerning the outcomes of the evaluation, the intended adjustments based on these outcomes and the effects of the actual adjustments.

Paragraph 4 – Registration for and withdrawal from examinations

Article 13 - Registration for written examinations
FSC right of approval; BoS advisory powers

1. Registration to participate in a written examination is compulsory and is done by entering the requested data into Osiris no later than 14 calendar days before the examination. Students receive examination tickets by email as confirmation of their registration.

2. Students who have not registered within the term specified in Section 1 may request registration for that examination after this term until no later than three calendar days before the examination by entering the requested data into Osiris. The request will be honoured providing that places are available in the room or rooms where the examination is scheduled to take place. Students receive examination tickets by email as confirmation of their registration.

3. In the event of circumstances beyond a student's control resulting in the student being unable to register for an examination, the Board of Examiners may nevertheless permit the student to participate in the examination.

4. Students who have not registered for the examination and are therefore not included on the list of examinees can report on the day of the examination to the invigilator beginning 15 minutes before the start of the examination until the actual start. They will be admitted to the examination room, in the order that they reported to the invigilator, 30 minutes after the start of the examination, if sufficient places are available. The loss of 30 minutes of examination time cannot be compensated. Students who have been granted late access to the examination will be added to the list of examinees. The student participates in the examination subject to the validation of entitlement to participate in the examination.

5. In the situation described in the previous section, if it is found that a student was not entitled to participate in the examination, the examination work will be deemed invalid, it will not be marked and it will not count towards a result. The student may subsequently submit an appeal to the Board of Examiners, accompanied by reasons, requesting that the examination work that has been deemed invalid be declared valid and to have it assessed. The Board of Examiners will approve the request only in case of extenuating circumstances.

Article 14 - Registration for other examinations
FSC right of approval; BoS advisory powers

1. Registration for participation in an examination other than a written examination is compulsory, and it is done in the manner and within the term that is stated in the study guide for the relevant examination.

2. In special cases, the Board of Examiners make exceptions to the registration term stated in Section 1, but only in favour of the student.

3. Students who have not registered on time will not be allowed to participate in the examination. The Board of Examiners can nevertheless admit a student to the examination, but only in case of special circumstances.

4. In the event of unauthorised participation in an examination, the Board of Examiners may declare the result invalid.

Article 15 - Withdrawal from examinations
FSC right of approval; BoS advisory powers

1. Students can withdraw from an examination through Osiris up to three calendar days before the examination.

2. Any student who has withdrawn from an examination should re-register on a subsequent occasion, in accordance with the provisions of Articles 13 and 14.

Paragraph 5 – Examinations

Article 16 - Form of the examinations and the manner of testing in general (Art. 7.13 Section 2, Subsections h and l WHW)
FSC right of approval, BoS advisory powers

1. Examinations (oral, written or otherwise) are taken in the manner described in the appendix.

2. The appendix contains a description of the moments at which and the numbers of times that examinations can be taken, along with their frequency, without prejudice to the provisions of these regulations concerning written and oral examinations.

3. A student may participate in an examination for a subject no more than twice in one academic year.

4. In special cases, the Board of Examiners will deviate from the provisions of this Article in favour of the student.

Article 17 – Times and number of written examinations (Art. 7.13 Section 2, Subsection j WHW)
FSC right of approval, BoS advisory powers

1. Two opportunities to take written examinations will be offered each academic year:

   - at the end of the teaching period in which the subject is taught, and
   - in the fifth week or at the end of the next teaching period or during the resit period in the months of July and August.

2. An annual timetable is issued detailing when written examinations may be taken, and it is published before the start of the relevant teaching period.

3. Contrary to the provisions in Section 1, the opportunity to take the written examination for a subject that is not taught in a certain academic year must be given at least once in that year.

Article 18 - Oral examinations (Art. 7.13 Section 2, Subsection n WHW)
FSC right of approval, BoS advisory powers

1. For oral examinations, no more than one student shall be tested at a time, unless determined otherwise by the examiner.

2. Oral examinations shall be public, except in special cases in which the Board of Examiners has decided otherwise, or if the student has filed an objection to the publicity of the examination.

3. The oral examination is administered by at least two examiners.

Article 19 - Determination and announcement of results (Art. 7.13 Section 2, Subsection o WHW)
FSC right of approval, BoS advisory powers

1. The examiner determines the result of a written examination as quickly as possible but by no later than 15 working days after the examination. The results of written interim examinations shall be announced no later than five working days before the next written interim examination.

2. The examiner determines the result of an oral examination immediately after it is administered and issues the student with a written statement of this result.

3. The examiner records the results of the assessment of a practical exercise as quickly as possible, but no later than 15 working days after the completion of the practical exercise at the designated time. In Osiris, the result will be dated on the date of completion of the practical exercise. With regard to a series of practical exercises in which the knowledge acquired in a previous practical exercise is important to the subsequent practical exercise, the result of the previous practical exercise shall be announced before the subsequent practical exercise. If this is not possible, the examiner shall schedule a timely discussion of the previous practical exercise.

4. The examiner is responsible for the registration and publication of the results in Osiris, with observance of the student's privacy. When the result of an examination is announced, the student is informed about the right of perusal as stipulated in Article 20 as well as about the possibility of appealing to the Examinations Appeals Board.

5. Contrary to the previous provisions, results achieved in the resit period in August shall be registered and published no later than the last working day of the week following the examination week in August.

6. If special circumstances prevent the examiner from registering the results on time, the examiner will report this to the Board of Examiners, accompanied by reasons, and notify the students and student administration as quickly as possible.

Article 20 - Right to inspect results (Art. 7.13 Section 2, Subsection p WHW)
FSC right of approval, BoS advisory powers

1. Upon request, students will have the right to inspect their assessed work during a period of at least 20 working days after the announcement of the results of a written examination or the assessment of a practical exercise. Students intending to appeal against the assessment of their work will be issued with a copy of the assessed work.

2. During the period mentioned in Section 1, all students who have participated in the examination can become acquainted with the questions and assignments of the relevant examination, as well as with the standards that form the basis of the assessment.

3. The examiner can determine that the inspection or cognizance intended in Sections 1 and 2 will take place at a pre-established place and at a pre-established time.

4. Students proving that they were unable to appear at such an established place and time because of circumstances outside of their control will be offered another possibility, if possible within the period mentioned in Section 1. The place and times mentioned in the first sentence will be made known in good time.

Article 21 - Discussion of the results of examinations (Art. 7.13 Section 2, Subsection q WHW)
FSC right of approval, BoS advisory powers

1. Students who have taken a written examination or who have received the assessment of a practical exercise can ask the relevant examiner for a discussion of the results during a period of 20 working days after the announcement of the results. The discussion will take place within a reasonable period, at a place and time to be determined by the examiner.

2. At the request of the student or at the initiative of the examiner, a discussion justifying the assessment will take place between the examiner and the student as soon as possible after the announcement of the result of an oral examination.

3. If a collective discussion is organised by the examiner, students may submit requests as referred to in the last section only if they have been present at the collective discussion and have motivated their requests, or if they were unable to be present at the collective discussion because of circumstances outside their control.

4. The Board of Examiners may allow deviation from the provisions in Sections 2 and 3.

Article 22 - Period of validity for examinations (Art. 7.13 Section 2, Subsection k, Art. 7.10, Section 4 WHW).
FS Council right of approval, BoS advisory powers

1. The period of validity of the results of an examination is indefinite. The dean can restrict the period of validity of a successfully completed examination only if the knowledge or insight that was examined has become outdated or if the skills that were examined have become outdated.

2. In cases involving a limited period of validity based on the first section, the period of validity shall be extended at least by the duration of the acknowledged delay in studies, based on the TU Delft Profiling Fund Scheme.

3. In individual cases involving special circumstances, the Board of Examiners can extend periods of validity that have been limited based on the first section or further extend periods of validity that have been extended based on the second section.

4. If a subject consists of interim examinations, the period of validity of the interim examination for which no credits are assigned shall be restricted to the academic year where the results have been obtained.

Article 23 - Exemption from an examination or obligation to participate in a practical exercise (Art. 7.13 Section 2, Subsection r WHW)
FSC right of approval, BoS advisory powers

1. After having obtained recommendations from the relevant examiner, the Board of Examiners may grant exemptions to students:
   a. who have successfully completed an examination or degree audit in a system of higher education within or outside the Netherlands that corresponds to the examination for which the exemption has been requested in terms of content and level, or
   b. who demonstrate that they possess sufficient knowledge and skills that have been acquired outside the system of higher education.

2. After having obtained recommendations from the relevant examiner, the Board of Examiners may grant exemption from the requirement to participate in a practical exercise with a view to admission to the related examination, possibly subject to alternative requirements.

Article 24 - Periods and frequency of degree audits (Art. 7.13 Section 2 WHW)
FSC right of approval, BoS advisory powers

In principle, the opportunity to take the Master's degree audit will be offered once each month. The dates for the meetings of the Board of Examiners shall be published before the beginning of the academic year.

Paragraph 6 – Studying with a disability

Article 25 - Adjustments to the benefit of students with disabilities or chronic illnesses (Art. 7.13 Section 2, Subsection m WHW)
FSC right of approval, BoS advisory powers

1. Upon a written and substantiated request to that effect, students with disabilities or chronic illnesses may be eligible for adjustments in teaching and examinations. These adjustments are coordinated to the situations of the students as much as possible, but they may not alter the quality or level of difficulty of a subject or the study programme. Facilities to be provided may include modifications to the form or duration of examinations and/or practical exercises to suit individual situations or the provision of practical aids.

2. Requests as mentioned in Section 1 must be accompanied by a recent statement from a physician or psychologist or, in cases involving dyslexia, from a testing office registered with BIG, NIP or NVO. If possible, this statement should include an estimate of the extent to which the condition is impeding the student's academic progress.

3. Decisions concerning requests for adjustments relating to educational facilities are taken by the Dean or by the Director of Studies on the Dean's behalf. Decisions concerning adjustments relating to examinations are taken by the Board of Examiners.

4. Adjustments to examinations can involve the following or other matters:

- form (e.g. replacing a written test with an oral test or vice versa, testing the required material in the form of interim examinations or granting exemptions to the attendance requirement);
- timing (e.g. additional time for an examination, wider staggering of examinations across the examination period, granting exemptions to admission requirements or extending the period within which a component must be completed);
- aids permitted during testing (e.g. English-Dutch dictionaries for students with dyslexia);
- location (taking the examination in a separate, low-stimulus space).

5. Adjustments in educational facilities could include:

- providing modified furniture in teaching and examination spaces;
- providing special equipment (e.g. magnification or Braille equipment for students with visual impairments and blindness or loop systems and individual equipment for students with hearing impairments and deafness);
- providing more accessible course material;
- providing special computer facilities (e.g. speech-recognition or speech-synthesising software);
- providing a rest area.

Paragraph 7 - Study support and (binding) recommendation on the continuation of studies

Article 26 – Study support and Monitoring of student progress (Art. 7.13 Section 2, Subsection u WHW)

FSC right of approval, BoS advisory powers

1. The Dean is responsible for providing individual study supervision to students registered for the degree programme, partly for their orientation towards potential study options within and outside the degree programme. He will also ensure that effective support and supervision is provided to students in making choices related to their studies.
2. The examination and study programme applying to each student is documented in Osiris.
3. The Student Administration is responsible for ensuring that all students are able to review and check their results in the Osiris student-information system.

Article 27 – (Negative) binding recommendation on the continuation of studies; ONLY FOR BACHELOR'S DEGREE PROGRAMMES

Paragraph 8- Final provisions

Article 28 - Conflicts with the regulations

In the case of conflict between provisions in the study guide or other document concerning the relevant teaching and examination education and study programme and these regulations, the provisions of these regulations shall take precedence.

Article 29 - Amendments to the regulations

1. Amendments to these regulations are adopted separately by the Dean.

2. Amendments that are applicable to the current academic year will be made only if they would not reasonably damage the interests of students.

3. Amendments to these regulations may not lead to disadvantageous changes to any decisions that have been made with regard to individual students.

Article 30 - Transitional measures

1. If the composition of the degree programme undergoes substantive changes, transitional measures will be established and published through the Dean.

2. These transitional measures shall include at least the following:
    a. an arrangement regarding exemptions that may be obtained based on examinations that have already been passed;
    b. the period during which the transitional arrangement shall be valid.

3. Students shall follow the degree programme as it applied or applies during the first academic year of their enrolment, unless components of the programme are no longer offered. In such cases, students must transfer according to the applicable transitional measures. Deviations require the approval of the Board of Examiners. Before submitting a request to this end, the student must have first obtained recommendations from an academic counsellor.

4. If a subject within a degree programme is cancelled, four additional opportunities for taking the examination in this subject shall be offered after it has been taught for the last time: the examination at the end of the teaching of the subject, a resit in the same academic year and two resits in the following academic year.

Article 31 - Announcement

1. The Dean is responsible for ensuring a suitable announcement of these regulations and any amendments to them.

2. In any case, the Teaching and Examination Regulations are to be posted on the programme's website.

Article 32 - Entry into force

These regulations shall enter into force on 1 September 2018.

Adopted by the Dean of the faculty on 20 August 2018

APPENDIX to Art. 3 of the Model TER (for Master's degree programmes)

Language level for individuals holding a higher professional education degree (c)

The English language, through the successful completion of one of the following tests:
- A TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90, or
- an IELTS (academic version) with an overall Band score of at least 6.5, or
- a proof of completion of the 'Certificate of Proficiency in English' (CPE) or the 'Certificate in Advanced English' (CAE), both of the University of Cambridge

Certificates must have been completed successfully before the start of the bridging programme.

The following candidates shall be exempted from the requirement to pass an English language test:
- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada
- Applicants with a Dutch Pre-university (VWO) certificate
- Applicants who have obtained a higher professional education degree in an English-language programme.

Language level for individuals holding a foreign degree (d)

The English language, through the successful completion of one of the following tests:
- A TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90 and a minimum score of 21 for each section, or
- an IELTS (academic version) with an overall Band score of at least 6.5 and a minimum score of 6.0 for each section, or
- a proof of completion of the 'Certificate of Proficiency in English' (CPE) or the 'Certificate in Advanced English' (CAE), both of the University of Cambridge

Certificates older than two years shall not be accepted.

The following candidates shall be exempted from the requirement to pass an English language test:
- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada
- Applicants who have obtained a Bachelor's degree in one of the countries mentioned.

APPENDIX to Article 5 of the Model TER

Final Qualifications MSc Mechanical Engineering

3TU-criteria
1. Competent in the scientific discipline Mechanical Engineering A graduate in Mechanical Engineering is able to… 1A. …apply advanced physics and measurement methods in mechanical systems. 1B. …design, carry out and evaluate experiments. 1C. …identify, design and control mechanical systems in an interactive and noisy environment. 1D. …relate scientific knowledge to mechanical systems considering their interaction with the environment.
2. Competent in doing research A graduate in Mechanical Engineering is able to… 2A. …study a topic by critically selecting relevant scientific literature. 2B. …write a scientific report about own research. 2C. …analyse mechanical systems at various levels of abstraction. 2D. …generate knowledge within the discipline of Mechanical Engineering.
3. Competent in designing A graduate in Mechanical Engineering is able to… 3A. …systematically design complex mechanical systems. 3B. …generate innovative contributions to the discipline of Mechanical Engineering.
4. A scientific approach A graduate in Mechanical Engineering is able to… 4A. …apply paradigms, methods and tools to (re)design a mechanical system. 4B. …manage own scientific research independently. 4C. …analyse problems and use modelling, simulation, design and integration towards solutions.
5. Basic intellectual skills A graduate in Mechanical Engineering is able to… 5A. …analyse and solve technological problems in a systematic way. 5B. …plan and execute research and design in changing circumstances. 5C. …integrate knowledge in an R&D project, considering ambiguity, incompleteness and limitations. 5D. …identify and acquire lacking expertise. 5E. …critically reflect on own knowledge, skills and attitude. 5F. …remain professionally competent. 5G. …take a standpoint with regard to a scientific argument within the research area.
6. Competent in operating and communicating A graduate in Mechanical Engineering is able to… 6A. …work both independently and in multidisciplinary teams. 6B. …present and report in good English. 6C. …explain and defend outcomes from the research area to academia and industry, to specialists and laymen.
7. Considering the temporal and social context A graduate in Mechanical Engineering is able to… 7A. …evaluate and assess the technological, ethical and societal impact of own work. 7B. …act responsibly with regard to sustainability, economy and social welfare.

Appendix belonging to Articles 6, 7 and 16 of the TER model Programme (MSc)

MASTER MECHANICAL ENGINEERING 2018-2019 - director Hans Hellendoorn - coordinator Ewoud van Luik

last updated 11-04-2018

COURSE CODE	COURSE NAME	ECTS	CONTACT HOURS AND EXAMS PER PERIOD YEAR 1 Q1	Q2	Q3	Q4	H	CONTACT HOURS AND EXAMS PER PERIOD YEAR 2 Q1	Q2	Q3	Q4	H	ASSESSMENT	RESPONSIBLE LECTURER(S)	LECTURER(S)
OBLIGATORY COURSES ME															
SC42000	Control Systems Design	3	4W	W									Written	Boom, van den	
ME45000	Advanced Heat Transfer	3	4W	W									Written	Delfos	
ME46000	Nonlinear Mechanics	4		4W	W								Written	Keulen, van	Ayas
ME46005	Physics and Measurement	6	4	4W	W								Written	Staufer, Elsinga	Goosen
RECOMMENDED SOCIAL COURSE (>=3 ECTS <= 6 ECTS OBLIGATORY)															
WM0349WB	Philosophy of engineering science and design	3	4W	W									Written		
WM0516TU	Turning Technology into Business	6		R									Report		
WM0801TU	Introduction to safety science	3		4W	W								Written		
WM0903TU	Technology and global development	3	2	2W	W								Written		
WM1301TU	Ethics of Transportation	3			4W	W							Written		
WM1302TU	Ethics of Transportation + essay	5			4W+R	W							Written + Essay		
	TOTAL OBLIGATORY ME	**19**													

A. BIOMECHANICAL DESIGN TRACK - coordinator Bob van Vliet

OBLIGATORY COURSES AND PROJECTS ME-BMD															
BM41045	Experimental Design, Statistics, and the Human	2			R								Assignment	Winter, de	
ME41055	Multibody Dynamics B	4			2	2R							Report	Schwab	
ME41070	The Human Controller	3				4W	W						Written	Abbink	
ME41080	Human-Machine Systems	4		4W	W								Written/Assign	Winter, de	
ME51010	ME-BMD Literature Report	10							x				Report	Dodou	
ME51015	ME-BMD Research Assignment / Internship	15								x			Report		
ME51035	ME-BMD MSc Project	35							x	x	x		Report		
	TOTAL OBLIGATORY ME-BMD	**92**													

o=obligatory / e = elective
o* = star elective

SPECIALISATION COURSES ME-BMD		BR	BITE	HI															
AE4318	Supervisory Control & Cognitive Systems			e															
AE4319	Manual Control & Cybernetics			e															
AE4ASM001	Design of lightweight structures I: Composites & Metals		e																
AE4ASM102	Advanced Alloys		e																
AE4ASM103	Functional Coatings		e																
AE4ASM104	Sensor Materials		e																
BM41040	Neuromechanics & Motor Control	o	e	o			5			4	4W	W						Written/Digital midterm exam	Mugge	Schouten, Veeger, vd Helm
BM41055	Anatomy and Physiology		e				4	2	2W	W								written	Dankelman	
BM41060	Physiology and Engineering		o*				3				2R							report	Dankelman	
BM41155	3D Printing		o*				4			4W	W							Written	Amir Zadpoor, Jie Zhou	
ID5331	Cognitive Ergonomics for Complex Systems			e																
IN4010(-12)	Artificial Intelligence Techniques	e																		
IN4015	Neural Networks	e																		
IN4085	Pattern Recognition	e																		
ME41005	Human and Robot Locomotion	o*					3				4							Assignments	Vallery, Wisse	
ME41015	Applied Experimental Methods: Human Factors			o			4				4W	W						Assignments	David Abbink	
ME41025	Robotics Practicals	e					3				P							report	Kooij	Gavrila
ME41030	3D Robot Vision	e					3			4W	W							written	Gavrila	Kooij
ME41050	Multibody Dynamics A	e	e	e			3		4W	W								written	Schwab	
ME41060	Matlab in Engineering Mechanics	e	e	e			2		2R									report	Schwab	
ME41065	System Identification and Parameter Estimation	e	e	o			7	4	4W	W								Written/Digital midterm exam	Schouten	Mugge
ME41085	Bio Mechatronics	e	o*	e			4			2	2W	W						written	Plettenburg	Helm
ME41095	Bio Inspired Design	e	o				4	4	4R									report	Breedveld	
ME46015	Precision Mechanism Design		o				4			2W	2R							written+report	Herder	Ostayen
ME46040	Experimental Dynamics	e	e	e			3			2	2R							report	Klerk, de	
ME46050	Advanced finite element methods	e	e	e			4			2	2O							Oral	Aragon	Langelaar
ME46055	Engineering Dynamics	e	e	e			4	4W	W									written	Alijani	
ME46060	Engineering Optimization: Concepts & Applications	e	e	e			3				4R							report	Langelaar	Keulen
ME46070	Mechanical Analysis for Engineering		e	e			4			4W	W							written	Ayas	
ME46080	Electronics and Measurement	e	e	e			4			2	2W	W						written	Buijnsters	Goosen
ME46115	Compliant Mechanisms		o				4			2	2R							report	Herder	Tolou
SC42020	Modern Robotics (Utwente, Virtual Class Room)	o*					5				4W	W						written+report	Kober	
SC42045	Control Systems Lab	o					4			4R								report	Mazo Espinosa	
SC42050	Knowledge Based Control Systems	o*		e			4			4W	W							written+report	Kober	
SC42055	Optimization in Systems and Control	e		e			4	4W	W									written	De Schutter	Boom van den
SC42090	Robot Motion Planning and Control	o					3			4W	W							written	Alonso Mora	
SC42095	Digital Control	e		e			3		4W	W								written	Kevicky	

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WI4141TU	Matlab for Advanced Users	e	e	e			3													
TW3720TU	Object Oriented Scientific Programming C++	e					3		X											

B. ENERGY AND PROCESS TECHNOLOGY TRACK - coordinator Brian Tighe

OBLIGATORY COURSES AND PROJECTS ME-EPT

ME45040	Advanced Fluid Dynamics					5	4W	4W	W									Written	Tam	
ME45160	Advanced Applied Thermodynamics					5			4W	W								Written	Aravind, Tighe	
ME45165	Equipment for Heat & Mass Transfer					5			8W+R	W+R								Written+report	Infante Ferreira, Eral	
ME45065	World of Energy and Process Technology					1	x	x	x	x								Report	Tummers	
ME55015	ME-EPT Research Assignment					15						x	x					Report	Mark Tummers	
ME55010	ME-EPT Literature Survey					10							x					Report	Mark Tummers	
ME55035	ME-EPT Thesis					35							x	x	x			Report	Mark Tummers	
					TOTAL OBLIGATORY ME-EFP	95														

COURSES ME-EPT

SELECT AT LEAST 10 ECTS

ME45030	Turbulence					5			4	4W	W							Written	Westerweel	
ME45070	Advanced Reaction & Separation Systems					5			4W+R	W+R								Written+report	Stankiewicz	
ME45135	Process Plant Design					5				4O+R								Oral+report	Kramer	
ME45155	Modelling of Thermo- & Hydrodynamic Systems					5			4	4W+R	W+R							Written+report	Pourquie, Pecnik, Boersma	

ELECTIVES COURSES ME-EPT

AE4117	Fluid-Structure Interaction																		
AE4140	Gas Dynamics																		
CH3043a	Process Dynamics & Control																		
CH3062	Multiphase Reactor Engineering																		
CH3141	Molecular Thermodynamics																		
CH3253SET	Thermochemistry of Biomass Conversion (former SET3041)																		
CH3672	Computational Materials Science																		
CH3804	Product & Process Design																		
ME45025	Introduction to Multiphase Flow					5			4	4W	W							Written	Breugem, Henkes	
ME45075	Refrigeration & Heat Pumps Fundamentals					4	4W+R	W+R										Written+report	Infante Ferreira	
ME45100	Fuel Cell Systems					3				4W	W							Written	Aravind	
ME45110	Indoor Climate Control Fundamentals					3	4W+R											Written+report	Itard	
ME45170	Turbomachinery					4			2	2W	W							Written	Pecnik, Klein	
ME45180	Energy Storage: Processes, Materials & Equipment					4		4R										Report	de Jong, Haije	
ME45190	Chaos					3		4R										Report	Van de Water	
ME45200	Electrochemical Energy Storage					4			2A	2W+R	W							Report+assignments	Haverkort, Kortlever	
ME45210	Introduction to Molecular Simulation					3				W+R	W							Written+report	Hartkamp, Moultos	
SET3041	Energy from Biomass																		
WI4014TU	Numerical Analysis																		
WI4019	Non-linear Differential Equations																		

C. HIGH-TECH ENGINEERING TRACK - coordinator Ron van Ostayen/Eveline Matroos

OBLIGATORY COURSES AND PROJECTS ME-HTE

ME46015	Precision Mechanism Design					4			2	2W	W							written	Herder	
ME46020	Micro – and Nanosystems Design and Fabrication, incl MEMS lab					4			5R									ass, Report	Ghatkesar	Staufer, Goosen
ME46055	Engineering dynamics					4	4W	W										Written	Alijani	
ME46060	Eng. optimization: concept & applications					3				4R								report, Assignment	Langelaar	van Keulen
ME46070	Fundamentals of Mechanical Analysis					4			4W	W								Written	Ayas	van Keulen
ME46085	Mechatronic system design					4		4W	W									Written	Hossein Nia Kani	
ME46105	Student colloquia and events PME					1	x	x	x	x								report	Matroos (coordinator)	
ME46110	Intro lab PME					2	x	x	x	x								assignment, report	Matroos (coordinator)	
60 ECTS TO COMPOSE WITH:																				
ME56010	ME-HTE/OM literature Survey					10						x						Report	Eveline Matroos, Hans Goosen	
ME56015	ME-HTE/OM traineeship					15							x					Report	Eveline Matroos, Hans Goosen	
ME56035	ME-HTE/OM Thesis Project					35								x	x			Report	Eveline Matroos, Hans Goosen	
ME56050	ME-HTE/OM Thesis Project					50							x	x	x			Report	Eveline Matroos, Hans Goosen	
					TOTAL OBLIGATORY TRACK	105														

r*=recommended elective
e = elective

SPECIALISATION COURSES ME-HTE		EM	MSD	MNE	ED															
AE4117	Fluid-structures interaction	e	e	e	e		4													
AE4ASM104	Sensor Materials	e	e	e	e		3													

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AE4880	Space Instrumentation	e	e	e	e		4													
AE4S12	Space Systems Engineering	e	e	e	e		3													
AE4ASM516	Materials selection in mechanical design	e	e	e	e		3													
CH4011MS	Polymer Science	e	e	e	e		4		4W	W								written	Mendes	
CIE4140	Structural Dynamics	r*	e	e	r*		4													
CIE5123	Introdcution to the Finite Element Method	e	e	e	e		4													
CIE5142	Computational methods in non-linear solid mechanics	r*	e	e	e		3													
CIE5145	Random vibrations	e	e	e	e		4													
ET4117	Electrical Machines and Drives	e	e	e	e		4													
ET4257	Sensors and Actuators	e	e	e	e		4													
ET4260	Microsystem Integration	e	e	e	e		4													
ET4277	Microelectronics Reliability	e	e	e	e		4													
ET4289	Integrated Circuits aand MEMS technology	e	e	e	e		4													
ET4391	Advanced Microelectronics packaging	e	e	e	e		3													
ME41055	Multibody dynamics B	e	r*	e	e		4			2	2R							Report	Schwab	
ME41060	MATLAB in engineering mechanics	e	e	e	e		2		2R									report	Schwab	
ME41095	Bio Inspired Design		e				4	4	4R									report	Breedveld	
ME46010	Intro to Nanoscience and Technology	e	e	r*	e		3			4W	W							Written	Staufer	
ME46030	Micro and Nanosystems for the Life Sciences	e	e	r*	e		3				4R							report, oral	Sasso	
ME46035	Stability of thin-walled structures 1	e	e	e	e		4			4OR								Oral + Report	van Keulen	
ME46040	Experimental dynamics	e	e	e	r*		3			2	2R							report	Klerk, de	
ME46050	Advanced finite element methods	e	e	e	e		4			2	2O							Oral	Aragon	Langelaar
ME46065	Thin Film Materials	e	e	e	e		3			4R								Report	Buijnsters	Nicola
ME46072	Nonlinear Dynamics	e	e	e	o*		4				4W+R							written exam+quize	Steeneken, Alijani	
ME46090	Predictive Modelling	e	r*	e	e		3				4O							Oral + Assignment	van Ostayen	
ME46095	Multiphysics modelling using COMSOL	e	e	e	e		4			2R								Report	Ron van Ostayen	Langelaar
ME46115	Compliant mechanisms	e	r*	e	e		4			2	2R							assign	Herder	Tolou
MS43100	Science of Failure	e	e	e	e		3			4W	W							Written	Janssen	
MS43210	Mechanical Behavior of Materials	e	e	e	e		4				4W	W						Written	Sloof	
SC42010	Robust and Multivariable Control design	e	e	e	e		5													
SC42025	Filtering and Identification	e	e	e	e		6													
SC42060	Modeling and Nonlinear Systems Theory	e	e	e	e		4													
TN2054	Elektromagnetism	e	e	e	e		6													
WI4014TU	Numerical analysis	e	e	e	e		6													
WI4019	Non-linear Differential Equations	e	e	e	e		6													

D. TRANSPORT ENGINEERING AND LOGISTICS TRACK - coordinator Mark Duinkerken

OBLIGATORY COURSES AND PROJECTS ME-TEL

ME44100	Dynamics of Material and Equipment Interaction						3												Dingena Schott	Xiaoli Jiang
ME44100 T1	Practicum - 25%						-		R									Report	Dingena Schott	Xiaoli Jiang
ME44100 T2	Tentamen - 75%						-		2W	W								Written exam	Dingena Schott	Xiaoli Jiang
ME44105	Structural Design with FEM						4		6 R									Report	Wouter van den Bos	Xiaoli Jiang
ME44110	Integration Project Large-scale Equipment						5			2	2 R							Report	Henk Polinder	
ME44200	Intelligent Control for Transport Technology						3			2 R								Report	Yusong Pang	Mark Duinkerken
ME44205	Quantitative Methods for Logistics						5												Mark Duinkerken	
ME44205 T1	Practicum - 25%						-	R										Report	Mark Duinkerken	
ME44205 T2	Tentamen - 75%						-	2	2W	W								Written exam	Mark Duinkerken	
ME44210	Drive & Energy Systems						3	2 W	W									Written exam	Henk Polinder	Yusong Pang
ME44300	Coordination for Real-time Logistics						3			2W	W							Written exam	Rudy Negenborn	
ME44305	System Analysis and Simulation						5			2	2 R							Report	Mark Duinkerken	
ME54010	ME-TEL Literature Assignment						10						x					Report	Mark Duinkerken	
ME54015	ME-TEL Research Assignment						15							x				Report	Mark Duinkerken	
ME54035	ME-TEL MSC Project						35								x	x		Report	Mark Duinkerken	
						TOTAL OBLIGATORY ME-TEL	110													

ELECTIVE COURSES ME-TEL

ME44115	Discrete Element Method (DEM) Simulation						4			4 R								Report	Dingena Schott	
ME44125	Structural Integrity Assessment for Transport Equipment						3			4 R								Report	Xiaoli Jiang	
ME44310	Advanced Operations and Production Management						6			2	2 R							Report	Wouter Beelaerts	

E. VEHICLE ENGINEERING TRACK - coordinator Riender Happee & Karin van Tongeren

OBLIGATORY COURSES AND PROJECTS ME-VE

ME41000	Automotive Human Factors						3				4W	W						Written	Happee	Gavrila

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ME41100	Vehicle Dynamics A	4			4W	W							Written	Shyrokau	
ME41105	Intelligent Vehicles 3ME	4	2W	2W	W								Written	Gavrila	Happee, Kooij JFP
ME57510	ME-VE Literature Survey	10						x	x				Report	Happee	
ME57015	ME-VE Research Assignment	15							x				Report	Happee	
ME57035	ME-VE thesis	35							x	x	x		Report	Happee	
	TOTAL OBLIGATORY ME-VE	90													

o* = star elective
e = elective

SPECIALISATION COURSES ME-VE		PM	VD	HF	MAT														
AE4ASM001	Design of lightweight structures I: Composites & Metals				e		3												
AE4ASM508	Design of self-healing materials				e		3												
BM41040	Neuromechanics & Motor Control			e			5			4W	W							Mugge, Schouten, Veeger, vd Helm	
CIE4801	Transportation and Spatial Modelling		e				6												
CIE4821-09	Traffic Flow Theory and Simulation		e	e			6												
CIE5128	Fibre-reinforced Polymer (FRP) Structures				e		3												
CIE5805	Intelligent Vehicles for Safe and Efficient Traffic		e	e			4												
CIE5810-09	Traffic Safety			e			4												
CS4180	Deep Learning	o*					6			4W	W								
ET4117	Electrical Machines and Drives		e				4												
ET4173	Introduction to UWB technology, systems and applications	e					4												
ID5242	Automotive Design			e	e		6												
IN4010	Artificial Intelligence Techniques	e	e				6												
IN4085	Pattern Recognition	o*					6												
IN4393	Computer Vision	e					5												
ME41015	Applied Experimental Methods: Human Factors			o*			4				4W	W						Assignments	Abbink	
ME41025	Robotics Practicals	o*	e	e			3				P							Practical	Kooij	Gavrila
ME47030	3D Robot Vision	o*	e				4			4W	W							Written	Gavrila	Kooij
ME41040	Integration Project Vehicle Engineering	e	e	e			6				R							Report	Happee	
ME41055	Multibody Dynamics B		e	e			4			4W	W							Report	Schwab	
ME41065	System Identification and Parameter Estimation		e	e			7	4W	W									Written	Schouten	
ME41070	The Human Controller	e	e	o*			3				4W	W						Written	Abbink	
ME41080	Man-Machine Systems			o*			4		4W	W								Written	De Winter	
ME41116	Vehicle Dynamics B - Vehicle Control	e	o*				4				4W	W						Written	Shyrokau	Alirezeai
ME43010	Materials for Light-Weight Constructions				o*		5		6W	W								Written	Sietsma	
ME46040	Experimental Dynamics		e				3			2	2R							report	Klerk, de	
MS43025	Mechanical behaviour of materials				e		4			4W	W							Written	Nicola	
MS43100	Science of failure				o*		3			4W	W							Written	Janssen	
MS43110	Joining technologies				o*		3				4W	W						Written	Richardson	
MS43115	Material selection in engineering applications				e		3				2							Oral + Report	Mol	
MS43120	Corrosion and protection against corrosion				e		3				4W	W						Written	Mol	
MT44010	Advanced Materials in Marine Structures				e		2		4O+R									Oral + Report	Kaminski	
SC42010	Robust and Multivariable Control Design		e				5			4W	W									
SC42025	Filtering & Identification		o*				6		4W										Verhaegen	
SC42040	Adaptive and Predictive Control		e				4			4W									Baldi	
SC42050	Knowledge Based Control Systems		e				4			4W									Kober	
SC42055	Optimization in Systems and Control		e				4	4W											van den Boom, De Schutter	
SC42075	Modeling and Control of Hybrid Systems		e				3				4W								De Schutter	
SC42090	Robot Motion Planning and Control		o*				3			4W	W							written	Alonso Mora	
SC42095	Digital Control		e				3		4W									written	Kevicky	
SC42105	Non-linear Control		e				5			4W										
TW3720TU	Object Oriented Scientific Programming C++	e					3		X											

F. OPTO-MECHATRONICS TRACK - coordinator Ron van Ostayen & Eveline Matroos

OBLIGATORY COURSES AND PROJECTS ME-OM																			
ME46085	Mechatronic system design						4		4W	W								Written	Hossein Nia Kani	
ME46105	Student colloquia and events PME						1	x	x	x	x							report	Matroos (coordinator)	
ME46110	Intro lab PME						2	x	x	x	x							assignment, report	Matroos (coordinator)	
ME46300	Optics						4	4W										Written	Urbach / Pereira	
ME46310	Opto-Mechatronics						4			2	2W	W						written	Kappelhof	Herder
ME46315	Technical & Micro Optical Systems						4			2	2R							Report	Vdovine	
SC42065	Adaptive Optics						3			3O&R										
60 ECTS TO COMPOSE WITH:							22													
ME56010	ME-HTE/OM literature Survey						10						x					Report	Eveline Matroos, Hans Goosen	

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			Q1	Q2	Q3	Q4	H	Q1	Q2	Q3	Q4	H			
ME56015	ME-HTE/OM Internship	15							x				Report	Eveline Matroos, Hans Goosen	
ME56035	ME-HTE/OM Thesis Project	35								x	x		Report	Eveline Matroos, Hans Goosen	
ME56050	ME-HTE/OM Thesis Project	50							x	x	x		Report	Eveline Matroos, Hans Goosen	
	TOTAL OBLIGATORY ME-OM	98													
SPECIALISATION COURSES ME-OM															
AE4880	Space instrumentation	4													
AE4ASM104	Sensor Materials	3													
AE4ASM108	Experimental Techniques & NDT	3													
AP3112D	Quantum Optics and Lasers	6													
AP3121	Imaging Systems	6													
AP3401	Introduction to Charged Particle Optics	6													
AP3701	Submm and terahertz physics and applications	3													
CIE4140	Structural Dynamics	4													
CIE5145	Random Vibrations	4													
EE4580	Quasi Optical Systems	4													
EE4595	Wavefield imaging	5													
ET4257	Sensors & Actuators	4													
ME41060	MATLAB in engineering mechanics	2		2R									Report	Schwab	
ME46055	Engineering dynamics	4	4W	W									Written	Alijani	
ME46060	Eng. optimization: concept & applications	3				4R							report, Assignment	Langelaar	Langelaar, van Keulen
ME46065	Thin Film Materials	3			4R								Report	Buijnsters	Nicola
ME46090	Predictive Moddeling	3				4O							Oral + Assignment	van Ostayen	
ME46095	Multiphysics modelling using COMSOL	4			2R								Report	Ron van Ostayen	Langelaar
NB2041	Optics and Microscopy	3													
SC42065	Adaptive Optics	3													
WI4019	Non-linear Differential Equations	6													
WI4210	Partial Differential Equations and Functional Analysis	6													

4	4 lecture hours per week
O	Oral exam
W	Written exam
R	Report, Assignment, Practical,