

**ONDERWIJS- EN EXAMENREGELING 2021-2022**

**VAN DE MASTEROPLEIDING**

**MECHANICAL ENGINEERING**

**VOLGENS DE GRADUATE SCHOOL**

**PROGRAM AND EXAMINATION REGULATIONS 2021-2022**

**FOR THE MASTER'S PROGRAM IN**

**MECHANICAL ENGINEERING**

**ACCORDING TO THE GRADUATE SCHOOL**

LET OP: In verband met de Covid-19 maatregelen zijn er addenda opgesteld. Hierin zijn (tijdelijke) wijzigingen van artikelen uit de OER opgenomen. Zie de digitale studiegids.

Het bestuur van de faculteit Mechanical Engineering van de Technische Universiteit Eindhoven, TU/e, besluit deze Onderwijs- en Examenregeling (hierna OER) van de masteropleiding Mechanical Engineering vast te stellen,

gelet op de artikelen 9.5, 9.15, eerste lid, onder a, 7.13, eerste, tweede en derde lid, 9.38, onder b, van de Wet op het hoger onderwijs en wetenschappelijk onderzoek (WHW),

en 9.18, eerste lid, onder a, alsmede artikel 7.8b WHW,

gelet op de instemming/het advies van de gemeenschappelijke opleidingscommissie d.d. 30 maart 2021,

gelet op de instemming/het advies van de universiteitsraad d.d. 19 april 2021,

gelet op de instemming/het advies van de faculteitsraad d.d. 21 juli 2021 ,

PLEASE NOTE: Addenda have been drawn up in connection with the Covid-19 measures. These include (temporary) amendments to articles in the OER. See the digital education guide.

The Board of the Department Mechanical Engineering of Eindhoven University of Technology, TU/e, hereby establishes these Program and Examination Regulations (hereafter OER) for the Master's program in Mechanical Engineering.

in view of Articles 9.5, 9.15, paragraph 1 under a, Article 7.13, paragraphs 1, 2 and 3, Article 9.38 under b, Wet op het hoger onderwijs en wetenschappelijk onderzoek' (WHW),

and Article 9.18, paragraph 1 under a, as well as Article 7.8b WHW,

in view of the approval/the advice of the Joint Program Committee of the Masters chamber on March 30, 2021,

in view of the approval/the advice by the University Council on April 19, 2021,

in view of the approval/the advice of the Department Council dated July 21<sup>st</sup>, 2021,

Onderwijs- en Examenregeling MSc Mechanical Engineering volgens de Graduate School 2021-2022 / Program and Examination Regulations MSc Mechanical Engineering 2021-2022 according to the Graduate School

gelet op de instemming/het advies van de opleidingscommissie d.d. 1 juli 2021,

gelet op het advies van de examencommissie d.d. 24 juni 2021.

Deze OER die op 1 september 2021 in werking treedt, met uitzondering van artikel 3.7 en 3.8, die met ingang van 1 augustus 2021 in werking treden, en geldig zijn tot en met 31 juli 2022,

luit als volgt:

in view of the approval/the advice of the Program Committee dated July 1<sup>st</sup>, 2021 ,

in view of the advice of the Examination Committee of June 24<sup>th</sup>, 2021,

This OER which enters into force on September 01, 2021 with exception of Articles 3.7 and 3.8 that enter into force on August 1, 2021 and are applicable to July 31, 2022,

read as follows:

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## H 1 ALGEMENE BEPALINGEN

### Art 1.1 Toepassingsgebied

1. Deze regeling is van toepassing op het onderwijs, de tentamens en het examen van de masteropleiding Mechanical Engineering.
2. Bepalingen van de Onderwijs- en Examenregeling van de betreffende bacheloropleiding zijn van toepassing wanneer masterstudenten bacheloronderwijseenheden volgen.
3. .  
Niet van toepassing.

### Art 1.2 Begripsbepalingen

- a. *Canvas*  
Canvas is het Learning Management System van de TU/e. Het is een online omgeving voor cursusmateriaal - projectgroepen, opdrachten, quizen en meer - dat een aanvulling vormt op het onderwijs met een persoonlijke aanpak.
- b. *Center for Student Administration (CSA)*  
Het Center for Student Administration, de afdeling waaronder alle onderwijsadministratiemedewerkers van de TU/e in dienst zijn. Elke faculteit heeft een facultair CSA.
- c. *competentie*  
de capaciteiten van een individu om een bepaalde combinatie van attitudes, vaardigheden en kennis te verkrijgen, selecteren en gebruiken,

## GENERAL PROVISIONS

### Scope

These regulations apply to the teaching, examinations and final examinations of the Master's program in Mechanical Engineering.

Stipulations of the Program and Examination Regulations of the Bachelor's program in question apply if Master's students take Bachelor's program study components.

Not applicable.

### Definitions

*Canvas*  
Canvas is the TU/e Learning Management System. It is an online environment for course materials – project groups, assignments, quizzes, and more – that complements face to face education.

*Center for Student Administration*  
The Center for Student Administration, the division where all program administration officers of TU/e work. Each department has its own Departmental CSA.

*competency*  
an individual's ability to acquire, select and use the set of attitudes, skills and knowledge that is required to behave effectively in a specific professional, societal or learning setting.

die vereist is om zich effectief in een specifieke professionele, maatschappelijke of onderwijssituatie te gedragen.

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| <p><b>d.</b> <i>course catalogue</i><br/>het onderdeel van OSIRIS waar de informatie over onderwijseenheden is opgeslagen en wordt getoond. Bij een onderwijseenheid wordt hier o.a. de betrokken docenten vermeld, de toetsonderdelen en de bijbehorende weging.</p> <p><b>e.</b> <i>Education and Student Affairs (ESA)</i><br/>De dienst binnen de TU/e waar studenten e.a. terecht kunnen voor een gevarieerd aanbod aan diensten op het terrein van onderwijsondersteuning.</p> <p><b>f.</b> <i>eindcijfer</i><br/>het cijfer van een onderwijseenheid dat is bepaald op basis van het cijfer (de cijfers) dat (die) is (zijn) behaald met (de component(en) en) het tentamen.</p> <p><b>g.</b> <i>examinator</i><br/>een functionaris die verantwoordelijk is voor een individuele onderwijseenheid aan de TU/e en door de examencommissie is aangewezen voor het beoordelen van studenten door middel van het afnemen van tentamens/CA's over de onderwijseenheid en het vaststellen van de uitslag daarvan.</p> <p><b>h.</b> <i>examen</i><br/>het masterexamen van de opleiding. Dit examen is met goed gevolg</p> | <p><i>course catalogue</i><br/>the part of OSIRIS in which information about study components is stored and displayed. For a study component mention is made of the teachers involved, the parts of the test and how these are weighed, among other things.</p> <p><i>Education and Student Affairs (ESA)</i><br/>the service within TU/e where students and others can make use of a variety of services in the field of educational support.</p> <p><i>final grade</i><br/>the grade for a study component that is determined on the basis of the grade (grades) that was (were) achieved for (parts of) the examination.</p> <p><i>examiner</i><br/>the officer responsible for an individual study component at TU/e who is appointed by the Examination Committee to assess students by means of examinations/CAs about the study component and to determine their results.</p> <p><i>final examination</i></p> |
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afgelegd als aan alle verplichtingen van de gehele masteropleiding is voldaan.

- i.** *kwartiel*  
het studiejaar is verdeeld in vier kwartielen. De aanvangs- en sluitingsdatum van deze kwartielen wordt jaarlijks vastgelegd in de Academische Jaaragenda TU/e.
- j.** *materiedeskundige*  
een inhoudelijk bekwame functionaris, niet zijnde een student.
- k.** *mentor*  
een door de directeur Graduate Program aangewezen universitair docent, een universitair hoofddocent of een hoogleraar, die studenten begeleidt bij het samenstellen van hun examenprogramma en de keuzes die daarbij moeten worden gemaakt.
- l.** *niet voldaan*  
de beoordeling van een onderwijseenheid indien de student niet aan alle eisen heeft voldaan, waardoor geen eindcijfer voor het tentamen kan worden vastgesteld.
- m.** *omzwaaijer*  
een student die de inschrijving voor een bepaalde opleiding dan wel een bepaald schakelprogramma gedurende het studiejaar wijzigt in een inschrijving voor een andere opleiding of schakelprogramma binnen de TU/e.

the Master's examination of the degree program. This examination is successfully completed if all requirements have been met concerning the Master's degree program as a whole.

- quarter*  
the academic year is divided into four quarters. The start and end dates of these quarters are determined annually in the TU/e annual academic calendar.
- subject specialist*  
a teacher or similar representative with expertise concerning content who is not a student.
- mentor*  
an assistant, associate or full professor appointed by the director of the Graduate Program, who supervises students as they put together their program of examinations and the related choices that need to be made.
- not met requirements*  
assessment of a study component in cases where students have not met all requirements, so that the final grade cannot be determined for the exam.
- intra-university transfer student*  
students who alter their enrollment in a certain degree program or pre-Master's program in the running academic year into an enrollment in another degree program or pre-Master's program at the TU/e.

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| <p><b>n.</b>        <i>onderwijseenheid</i><br/>een onderdeel van de opleiding gericht op de verwezenlijking van welomschreven doelen op het gebied van kennis, inzicht, vaardigheden en competentie-ontwikkeling, waaraan een tentamen is verbonden.</p>  | <p><i>study component</i><br/>a component of the degree program aimed at achieving clearly defined goals concerning knowledge, insight, skills, and/or competency development with an associated examination.</p>   |
| <p><b>o.</b>        <i>OSIRIS</i><br/>het onderwijsadministratiesysteem waarin gedurende de inschrijfperiode de administratie van studenten wordt bijgehouden door de facultaire onderwijsadministraties (Facultaire CSA).</p>   | <p><i>OSIRIS</i><br/>the educational administration system in which the administration of students is maintained by the Departmental Center of Student Administration during the registration period.</p>   |
| <p><b>p.</b>        <i>PlanApp</i><br/>het onderdeel van OSIRIS waar studenten een planning van hun examenprogramma kunnen maken en waar studenten deze via de app bij de examencommissie kunnen indienen ter kennisgeving dan wel ter goedkeuring.</p>  | <p><i>PlanApp</i><br/><i>the part of OSIRIS where students can schedule their program of examinations and can submit their choice of electives to the Examination Committee to inform them or for approval.</i></p>   |
| <p><b>q.</b>        <i>praktische oefening</i><br/>een onderwijsactiviteit in één van de volgende vormen:</p> <ul style="list-style-type: none"><li>- het maken van een scriptie,</li><li>- het maken van een werkstuk of een proefontwerp,</li><li>- het uitvoeren van een ontwerp- of onderzoekopdracht/-project,</li><li>- het verrichten van een literatuurstudie,</li><li>- het doorlopen van een stage,</li><li>- het verzorgen van een (openbare) presentatie,</li><li>- het deelnemen aan veldwerk of een excursie,</li><li>- het uitvoeren van proeven en experimenten,</li><li>- het schrijven van een position paper,</li></ul> | <p><i>practical exercise</i><br/>an educational activity in one of the following forms:</p> <ul style="list-style-type: none"><li>- writing a thesis,</li><li>- undertaking a project or an experimental design,</li><li>- carrying out a design or research assignment/project,</li><li>- doing a literature study,</li><li>- doing an internship,</li><li>- making a (public) presentation,</li><li>- taking part in fieldwork or an excursion,</li><li>- conducting tests and experiments,</li><li>- writing a position paper,</li></ul> |



- het deelnemen aan andere praktische onderwijsactiviteiten gericht op het verwerven van beoogde vaardigheden.

De betreffende onderwijsactiviteit, is een onderdeel van een onderwijseenheid die met een tentamen wordt afgerond, of een onderwijseenheid.

- taking part in other practical educational activities designed to acquire specific skills.

The educational activity in question, is part of a study component that is finalized with an exam, or a study component.

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| <p><b>r.</b> <i>professionele vaardigheden</i><br/>niet-disciplinaire vaardigheden die noodzakelijk zijn voor een succesvol afgestudeerde master in een professionele omgeving.</p>  | <p><i>professional skills</i><br/>non-disciplinary skills required in a professional environment by a successful Master's graduate</p>   |
| <p><b>s.</b> <i>reactietermijn</i><br/>een termijn van vier weken waarbinnen de examencommissie dient te besluiten na ontvangst van een verzoek, tenzij het verzoek is ontvangen na de vergadering van de examencommissie in juni. Een dergelijk verzoek wordt uiterlijk in de vergadering van augustus afgehandeld.</p> | <p><i>response term</i><br/>the Examination Committee must decide within four weeks of having received a request, unless the request was made after the Examination Committee meeting held in June. Such requests are processed in the August meeting.</p> |
| <p><b>t.</b> <i>schakelprogramma</i><br/>een programma om deficiënties weg te werken dat na afronding toegang geeft tot een bepaalde masteropleiding.</p>  | <p><i>pre-Master's program</i><br/>a program to eliminate deficiencies and after completion grants admission to a particular Master's program.</p>   |
| <p><b>u.</b> <i>schakelstudent</i><br/>degene die voor de toelating tot de masteropleiding een schakelprogramma volgt om deficiënties weg te werken.</p>   | <p><i>pre-Master's student</i><br/>students who are required to follow a pre-Master's program to eliminate deficiencies before being admitted to the Master's program.</p>   |
| <p><b>v.</b> <i>schriftelijk</i><br/>daar waar de term 'schriftelijk' wordt gebruikt, wordt eveneens digitale communicatie (e-mail) of digitale afname van tentamens bedoeld.</p>  | <p><i>written</i><br/>where the term 'written' is used, digital communication (e-mail) or digital examinations are implied too.</p>  |
| <p><b>w.</b> <i>spijtoptant</i></p>  | <p><i>re-enroller</i><br/>a person who re-enrolls at TU/e after an interruption.</p>   |

iemand die zich na een onderbreking weer opnieuw als student aan de TU/e inschrijft.

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| <p><b>x.</b> <i>student</i><br/>iemand die een opleiding volgt aan de TU/e en is ingeschreven voor de opleiding waar deze OER betrekking op heeft, conform de geldende Regeling Aanmelding, studiekeuzecheck, inschrijving en beëindiging inschrijving van de TU/e.</p> <p><b>y.</b> <i>studiejaar</i><br/>de periode die aanvangt op 1 september en eindigt op 31 augustus van het daaropvolgende jaar.</p> <p><b>z.</b> <i>studielast</i><br/>de verwachte inspanning die nodig zijn om een opleiding of onderwijseenheid met voldoende resultaat af te ronden. De eenheid die gebruikt wordt is studiepunten, waarbij 1 studiepunt (sp) overeenkomt met 28 uur.</p> <p><b>aa.</b> <i>switcher</i><br/>iemand die in het studiejaar voorafgaand aan het studiejaar waarvoor diegene zich heeft aangemeld een inschrijving heeft voor een andere opleiding aan de TU/e (interne switcher) dan wel elders bij een instelling voor hoger of wetenschappelijk onderwijs (externe switcher).</p> <p><b>bb.</b> <i>tentamen</i><br/>is verbonden aan een onderwijseenheid en betreft een onderzoek naar de kennis, het inzicht en de vaardigheden van de student, alsmede de beoordeling van de uitkomsten van dat onderzoek.</p> <p><b>cc.</b> <i>werkdag</i></p> | <p><i>student</i><br/>a person taking a degree program at TU/e who is enrolled in the degree program this OER is related to, in accordance with the applicable TU/e Regulations 'Registration, Study Choice Check, Enrollment and Termination of Enrollment'.</p> <p><i>academic year</i><br/>the period that starts on September 1 and ends on August 31 of the following year.</p> <p><i>study workload</i><br/>the expected number of hours of study required to successfully complete a degree program or study component. The study workload is expressed in credits, where 1 credit is equal to 28 hours.</p> <p><i>transfer student</i><br/>students who, during the academic year prior to the academic year for which they registered, were enrolled at TU/e (internal transfer student) or elsewhere at an institution for higher education or university education (external transfer student)</p> <p><i>examination</i><br/>connected to a study component and concerns an investigation into the knowledge, insight and skills of students, as well as an assessment of the results of that investigation.</p> <p><i>working day</i></p> |
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een van de weekdays maandag tot en met vrijdag, met uitzondering van de door de Nederlandse overheid als zodanig erkende feestdagen en de dagen waarop de universiteit is gesloten.

**dd.** *WHW*  
de Wet op het Hoger onderwijs en Wetenschappelijk onderzoek.

**ee.** De overige in deze regeling voorkomende begrippen hebben de betekenis die de wet eraan geeft.

**Art 1.3 TU/e Gedragscode wetenschappelijke integriteit**

Gedurende de inschrijving als student zijn studenten gehouden aan de TU/e Gedragscode wetenschappelijke integriteit. In de eerste helft van de opleiding ondertekenen de studenten een verklaring in aanwezigheid van de mentor, dat gedurende de masteropleiding conform de TU/e Gedragscode Wetenschappelijke integriteit zal worden gehandeld. Deze verklaring dienen studenten in te leveren bij het facultaire Center of Student Administration (hierna het facultaire CSA). Bij aanvang van het afstudeerproject is een verklaring van de student gevoegd dat in overeenstemming met de gedragscode zal worden gehandeld en bij oplevering van het afstudeerwerk is een verklaring opgenomen dat dit werk tot stand is gekomen in overeenstemming met de gedragscode.

Bij overtreding van deze gedragscode kan er melding worden gedaan bij de klachtencommissie wetenschappelijke integriteit van de TU/e. Deze klachtencommissie besluit door wie de melding zal worden afgehandeld: door de klachtencommissie of de examencommissie van de opleiding, die

one of the weekdays, i.e. Monday through Friday, with the exception of public holidays recognized by the Dutch government, and days on which the university is closed.

*WHW*  
Higher Education and Scientific Research Act (WHW).

The other terms used within these regulations have the meaning ascribed to them by law.

**TU/e Code of Conduct for Scientific Integrity**

During enrollment students are held to the TU/e Code of Conduct for Scientific Integrity. In the first half of the program, the student must sign a statement in the presence of the mentor indicating they shall act in accordance with the TU/e Code of Conduct for Scientific Integrity throughout the Master's program. This statement must be submitted to the departmental Center of Student Administration (henceforth departmental CSA) by the students. An attachment is added at the beginning of the graduation project stating that students will act in accordance with the TU/e Code of Conduct for Scientific Integrity. When the graduation work is completed, a statement is attached indicating that the work was realized in accordance with the code of conduct.

Violation of this code of conduct may be reported to the Complaints Committee for Scientific Integrity at TU/e. This Complaints Committee decides who shall process the incident: the Complaints Committee or the Examination Committee of the respective degree program that deals with

fraude afhandelt conform de bepalingen van het Reglement van de examencommissie.

fraud in accordance with the stipulations of the Regulations for the Examination Committee.

#### **1.4 De gebruikte digitale onderwijsystemen**

In verschillende artikelen zijn de namen gebruikt van de digitale onderwijsystemen die op dit moment aan de TU/e worden gebruikt. Indien gedurende het studiejaar die met naam genoemde onderwijsystemen zouden worden vervangen door andere, vergelijkbare onderwijsystemen, dan dient de nieuwe naam van het onderwijsysteem in de plaats van het 'oude' onderwijsysteem te worden gelezen.

#### **The digital learning environments**

In various articles the names are used of the digital learning environments presently operative at the TU/e. If the digital learning environments are replaced during the course of the academic year, the new name of the learning environment should be read in the place of the old learning environment.

## **H 2 TOELATING EN INSCHRIJVING TOT DE OPLEIDING**

## **ADMISSION TO AND ENROLLMENT IN THE PROGRAM**

### **Art 2.1 Toelating en inschrijving**

### **Admission and enrollment**

- 1.** De inschrijving aan de masteropleiding staat uitsluitend open voor degenen die tot deze masteropleiding rechtstreeks toegang hebben op grond van een bachelor getuigschrift als genoemd in bijlage 1 onder m, over een toelatingbewijs beschikken zoals genoemd in het tweede lid, of over een verklaring van de examencommissie van die bacheloropleiding beschikken.
- 2.** Een toelatingbewijs wordt door het faculteitsbestuur verstrekt op grond van de geldende Regeling Toelating Masteropleidingen TU/e. De kwalitatieve toelatingseisen, waarnaar de Regeling Toelating Masteropleidingen TU/e verwijst, zijn opgenomen in bijlage 1 onder l.

Enrollment in the Master's degree program is open only to those who have direct access to this program based on a Bachelor's degree certificate, as specified in Appendix 1 under m, a proof of admission as referred to in paragraph 2 or who possess a statement issued by the Examination Committee of the Bachelor's program in question.

Proof of admission will be issued by the Department Board on the basis of the applicable TU/e Admission Regulations for Master's Programs. The qualitative admission requirements, to which the Regulations for Admission to the TU/e Master's Programs refer, are included in Appendix 1 under l.

- 3.** Studenten die een TU/e bacheloropleiding, TU/e masteropleiding of een TU/e schakelprogramma hebben gevolgd, kunnen per de eerste dag van de maand instromen in de masteropleiding, mits wordt voldaan aan de gestelde eisen en er sprake is van een aaneengesloten periode van inschrijving aan deze universiteit. TU/e studenten die een competentiegerichte bacheloropleiding hebben afgerond en studenten die op basis van een bacheloropleiding die is afgerond aan een andere universiteit zijn toegelaten, kunnen op 1 september en 1 februari van ieder studiejaar instromen in de masteropleiding, mits wordt voldaan aan de gestelde eisen. Zie ook bijlage 1, onder k.
- Students who have followed a TU/e Bachelor's program, TU/e Master's program, or a TU/e pre-Master's program may be admitted to the Master's program on the first day of the month, provided they meet the requirements and have been enrolled at the university for a continuous period. TU/e students who have completed a competency-centered Bachelor's program and students who have completed a Bachelor's program at a different university are admissible for enrollment in the Master's program starting on September 1 and February 1 of each academic year, provided they meet the requirements. See also Appendix 1, under k.

**Art 2.2 Het volgen van masteronderwijseenheden zonder toelating/inschrijving**

Conform artikel 5.2 van de OER van de bacheloropleiding is het toegestaan dat bachelor- of schakelstudenten enkele masteronderwijseenheden van de opleiding volgen (zonder feitelijke masterinschrijving), mits voldaan wordt aan de gestelde eisen en daarvoor toestemming is verleend door de examencommissie van de masteropleiding, waartoe de onderwijseenheden behoren. Zie ook artikel 5.3, tweede lid, van deze OER.

**Following Master's program study components without admission/enrollment**

In accordance with Article 5.2 of the Program and Examination Regulations for Bachelor's programs at TU/e, Bachelor's students or Pre-Master's students may participate in some study components of the Master's program (without actually being enrolled in the Master's program), provided the requirements have been fulfilled and permission to do so has been obtained from the Examination Committee of the relevant Master's program. See also Article 5.3, paragraph 2 of these Program and Examination Regulations.

**H 3 OPBOUW EN INHOUD VAN DE OPLEIDING**

**STRUCTURE AND CONTENT OF THE DEGREE PROGRAM**

**Art 3.1 Eindtermen van de opleiding**

**Learning outcomes of the degree program**

**1. Algemene eindtermen van de opleiding**

**General learning outcomes of the degree program**

Afgestudeerde masters of science van deze opleiding:

- zijn academisch gevormd binnen het domein van 'science, engineering & technology',
- zijn competent in de relevante domeinspecifieke discipline(s) op het niveau van de wetenschappelijke master, zoals weergegeven in het tweede lid,
- kunnen zelfstandig onderzoeken en ontwerpen,
- zijn in staat en hebben de houding om waar nodig bij het eigen onderzoek andere disciplines te betrekken,
- hebben een wetenschappelijke benadering van problemen en ideeën van complexe aard,
- beschikken over intellectuele vaardigheden om kritisch te kunnen reflecteren, logisch te redeneren en tot oordeelsvorming komen,
- kunnen op internationaal niveau communiceren over resultaten van eigen leren, denken en beslissingen,
- zijn zich bewust van de temporele en maatschappelijke context van wetenschap en technologie (begrip en analyse) en integreren deze in het wetenschappelijke werk,
- hebben naast een herkenbaar domeinspecifiek profiel een voldoende brede basis om interdisciplinair en multidisciplinair (samen) te kunnen werken. Multidisciplinair betekent hier: gericht op andere relevante disciplines die nodig zijn om het ontwerp- of onderzoeksprobleem op te lossen,
- zijn in staat en hebben de houding om te zoeken naar nieuwe toepassingsmogelijkheden en houden daarbij rekening met de maatschappelijke context.

Masters of Science graduates of this degree program:

- are academically qualified to degree level within the domain of 'science engineering & technology',
- are competent in the relevant domain-specific discipline(s) at the scientific Master's degree level, as indicated in paragraph 2,
- are able to conduct research and design independently,
- have the ability and attitude to include other disciplines in their research, where necessary,
- have a scientific approach to complex problems and ideas,
- possess intellectual skills that enable them to reflect critically, reason and form opinions,
- have the ability to communicate the results of their learning, thinking and decision-making processes at an international level,
- are aware of the temporal and social context of science and technology (comprehension and analysis) and can integrate this context in their scientific work,
- in addition to a recognizable domain-specific profile, possess a sufficiently broad basis to be able to work or collaborate in an interdisciplinary and multidisciplinary context. In this context, multidisciplinary means being focused on other relevant disciplines needed to solve the design or research problem in question,
- have the ability and attitude to seek new potential applications, taking the social context into consideration.

**2. Domeinspecifieke disciplines**

zoals bedoeld in het vorige lid, tweede punt:

Werktuigbouwkunde, d.w.z.

- hebben een goed begrip van ten minste één van de kerndisciplines van Werktuigbouwkunde: Systemen, Dynamica & Regeltechniek, Mechanica & Materialen, Energie & Stroming,
- zijn in staat om hun kennis in het vakgebied te onderhouden en uit te breiden,
- hebben goede kennis van de basisvakken die ten grondslag liggen aan dit vakgebied,
- zijn in staat deze kennis en dit begrip toe te passen om structuren, machines, apparaten, systemen of processen op een manier te analyseren en te synthetiseren dat ze het gewenste doel op een veilige, ethische en duurzame manier bereiken.

**Art 3.2 Specifieke opleidingsbepalingen**

1. Wat betreft de opleiding is in bijlage 1 opgenomen:

- a. de inhoud van de opleiding en van het daaraan verbonden examen,
- b. de inhoud van de tracks,
- c. de inrichting van de praktische oefeningen,
- d. de studielast van de opleiding en van elk van de daarvan deel uitmakende onderwijsseenheden,
- e. het aantal en de volgtijdelijkheid van de tentamens alsmede de momenten waarop deze afgelegd kunnen worden,

**Domain-specific disciplines**

as intended by the previous paragraph, second point:

Mechanical Engineering, i.e.

- have a profound understanding of at least one of the core disciplines of Mechanical Engineering: Systems, Dynamics & Control, Mechanics & Materials, Energy & Flow,
- are able to maintain and expand their expertise in this field,
- have good knowledge of the basic sciences that underlie this field,
- are able to apply this knowledge and understanding to analyze and synthesize structures, machines, devices, systems or processes that accomplish a desired objective in a safe, ethical and sustainable way.

**Requirements specific to the degree program**

With reference to the program, Appendix 1 includes the following:

- the content of the degree program and the corresponding examinations
- the content of the tracks,
- the organization of the practical exercises,
- the study workload of the program and of each of the accompanying study components,
- the number and the sequencing of the examinations, and the times at which they can be taken,

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| <b>f.</b> | of de opleiding in voltijd en/of deeltijd wordt verzorgd,   | whether the program is offered as a full time and/or part time program,  |
| <b>g.</b> | of de tentamens mondeling, schriftelijk of op andere wijze worden afgelegd,   | whether examinations are to be taken orally, in writing or otherwise,  |
| <b>h.</b> | waar nodig, dat het met goed gevolg afgelegd hebben van tentamens voorwaarde is voor de toelating tot andere tentamens,   | where necessary, that successful participation in examinations is a condition for admission to other examinations,   |
| <b>i.</b> | waar nodig, de verplichting tot het deelnemen aan praktische oefeningen (als onderdeel van een onderwijseenheid) met het oog op de toelating tot het afleggen van het desbetreffende tentamen,  | where necessary, the obligation to take part in practical exercises (as part of a study component) with a view to taking the examination in question,  |
| <b>j.</b> | de onderwijseenheden waaruit studenten een keuze dienen te maken voor de invulling van de vrije keuzeruimte van de opleiding,   | the study components from which the students must choose in order to complete the elective part of the degree program,   |
| <b>k.</b> | het aantal instroommomenten van de masteropleiding,   | the number of opportunities to join the Master's program,  |
| <b>l.</b> | de toelatingseisen op grond waarvan een bewijs van toelating kan worden afgegeven,  | the requirements for issuing a certificate of admission,   |
| <b>m.</b> | bachelor getuigschriften die rechtstreeks toegang geven tot de opleiding,   | Bachelor's degree certificates that provide direct access to the Master's program,   |
| <b>n.</b> | overgangsregelingen, zoals bedoeld in artikel 8.1,  | the transitional arrangements as referred to in Article 8.1,   |
| <b>o.</b> | de wijze waarop het onderwijs in de opleiding geëvalueerd wordt en de resultaten aan de in aanmerking komende gremia beschikbaar gesteld worden. De evaluatie vindt plaats door ten minste periodieke vakevaluaties en vakoverstijgende evaluaties middels de binnen de TU/e afgesproken formats. | the way in which education in the degree program is evaluated and the results are made available to the relevant official bodies. The evaluation takes place through periodic course evaluations at the very least and by other degree program evaluations within the agreed TU/e formats. |



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| <p><b>p.</b> de praktische oefening(en), waarvoor per studiejaar slechts eenmaal aan studenten de gelegenheid geboden wordt deze af te leggen.</p> <p><b>2.</b> In bijlage 2 staan de regels en procedures in verband met de schakelprogramma's vermeld.</p> <p><b>3.</b> In bijlage 3 is voorts de inhoud van het schakelprogramma opgenomen.</p> <p><b>4.</b> In bijlage 4 is een toelichting op de regels rondom het schakelprogramma opgenomen.</p> <p><b>5.</b> De bijlagen maken integraal onderdeel uit van deze regeling.</p>                 | <p>the practical exercise(s) for which only one opportunity is given per academic year.</p> <p>Appendix 2 contains the rules and procedures for pre-Master's programs.</p> <p>Appendix 3 describes the contents of the pre-Master's program.</p> <p>Appendix 4 provides information regarding the regulations pertaining to the pre-Master's program.</p> <p>The appendices constitute an integral part of these Regulations.</p>  |
| <p><b>Art 3.3 Taal</b></p> <p>Het onderwijs wordt geheel in het Engels gegeven en de tentamens en examens worden afgenomen in het Engels.</p>   | <p><b>Language</b></p> <p>The program is delivered entirely in English and the examinations and final examinations are administered in English.</p>  |
| <p><b>Art 3.4 Opbouw van de opleiding</b></p> <p><b>1.</b> De opleiding is een samenhangend geheel van onderwijseenheden gericht op de verwezenlijking van de eindtermen van de opleiding.</p> <p><b>2.</b> De opleiding heeft een studielast van 120 studiepunten en is onderverdeeld in verschillende onderwijseenheden zoals vermeld in de geldende <u>Richtlijn masteropleidingen Graduate School</u>. In bijlage 1 is het programma van de opleiding verder uitgewerkt (zie artikel 3.2, eerste lid, onderdeel a, juncto bijlage 1 onder a).</p> | <p><b>Structure of the degree program</b></p> <p>The program is a coherent set of study components designed to achieve the learning outcomes of the program.</p> <p>The program has a study load of 120 credits and is divided into various study components as stated in the applicable Guideline of Master's Programs Graduate School. Appendix 1 contains details on the degree program (see Article 3.2, paragraph 1, part a, in conjunction with Appendix 1, part a).</p> |
| <p><b>Art 3.5 Mentor</b></p> <p><b>1.</b> Elke student wordt gedurende de opleiding begeleid door een mentor van het betreffende programma. Uiterlijk vijf maanden na aanvang van de</p>  | <p><b>Mentor</b></p> <p>Students will receive program-related supervision from a mentor from the degree program for the duration of the program. Students will be linked to</p>  |

opleiding is de student gekoppeld aan een mentor, tenzij er sprake is van bijzondere omstandigheden te bepalen door de examencommissie op verzoek van die student.

a mentor no later than five months after the degree program has commenced, unless those students request acknowledgement of special circumstances by the Examination Committee.

**2.** Een mentor

- begeleidt studenten bij het invullen van de specialistische keuzeonderwijseenheden en stelt een advies op,
- begeleidt studenten bij de verdere invulling van het examenprogramma,
- heeft in het kader van de ontwikkeling van professionele vaardigheden een individueel gesprek met studenten bespreekt met hen het door hen opgestelde ontwikkelingsplan professionele vaardigheden.

A mentor:

- supervises students in their choice of specialized elective study components and gives advice,
- supervises students as they compose the rest of the program of examinations,
- within the framework of developing professional skills, meets with the students to discuss the professional skills development plan they have developed.

**3.** Wanneer studenten er niet voor kiezen minimaal 15 studiepunten aan internationale ervaring in hun examenprogramma op te nemen, bespreken zij dit individueel met hun mentor.

If students have not chosen to include a minimum of 15 credits worth of international experience in their program of examinations, they must discuss this with their mentor.

**Art 3.6 Examenprogramma**

**Program of Examinations**

**1.** Een examenprogramma is een geheel van onderwijseenheden dat voor studenten het programma van de opleiding vormt.

A program of examinations is a coherent set of study components that makes up students' degree programs.

**2.** Studenten dienen een keuze te maken uit de in de bijlage 1, onder j, opgenomen specialistische keuzeonderwijseenheden en vrije keuzeonderwijseenheden op masterniveau. De specialistische keuzeonderwijseenheden worden pas na een advies van de mentor aan het examenprogramma toegevoegd.

Students must choose the specialized study components and free elective study components at Master's level included in Appendix 1 under j. The specialized elective study components are only added to the program of examinations after advice from the mentor.

Voor de invulling van de vrije keuze-onderwijseenheden kunnen maximaal 15 studiepunten aan bachelor onderwijseenheden worden gebruikt voor het wegwerken van deficiënties (homologatie-onderwijseenheden).

Within the free electives, a maximum of 15 credits of Bachelor's study components may be used to compensate deficiencies (homologation study components).

3. Studenten bieden hun examenprogramma, waarvan een advies (zoals bedoeld in het vorige lid) van de mentor onderdeel uitmaakt, ter goedkeuring aan bij de examencommissie. De examencommissie besluit binnen de reactietermijn.

Students must submit their program of examinations including the advice issued by the mentor (as referred to in the previous paragraph), to the Examination Committee for approval. The Examination Committee must reach their decision within the response term.

4. Een besluit om de goedkeuring niet te verlenen wordt door de examencommissie niet eerder genomen dan nadat studenten in de gelegenheid zijn gesteld te worden gehoord.

A decision to deny approval may not be made before students have been given the opportunity to be heard by the Examination Committee.

5. Bij de te maken keuzes houden studenten rekening met het profiel, het beroepsperspectief en/of de academische accenten c.q. verbreding die zij in hun studie willen aanbrengen.

In making those program of examination choices, students must take account of the profile, career prospects and/or the academic emphases or broadening they wish to incorporate in their program.

6. Studenten bieden uiterlijk zes maanden na de start van hun masteropleiding hun voorlopige examenprogramma, waarvan een advies van de mentor deel uitmaakt, ter kennisgeving aan bij de examencommissie. Bij de samenstelling van dit individuele programma dient de samenhang geborgd te worden in samenspraak tussen studenten en hun mentor.

No later than six months after the start of their Master's program, students must submit their provisional program of examinations, including the advice issued by the mentor, to the Examination Committee for information. When composing this personal program of examinations, students should consult with the mentor to ensure that sufficient coherence is achieved

7. De examencommissie controleert het examenprogramma op coherentie en niveau, alsmede of het voldoet aan de eisen die gesteld worden aan een masterprogramma. Hierbij betreft zij het advies van de mentor.

The Examination Committee checks the program of examinations for coherence and quality as well as to ensure it meets the requirements for a Master's program. This involves the advice of the mentor.

#### **Art 3.7 Aanmelden en afmelden van onderwijseenheden**

#### **Registering for and deregistering for study components**

- 1.** Een student kan zich voor een maximum van 20 studiepunten per kwartiel aan onderwijseenheden aanmelden en daarin tentamens afleggen. De student die voor meer onderwijseenheden wil aanmelden dient toestemming te verkrijgen van de examencommissie.

A student can register for a maximum of 20 study credits of study components per quarter and take examinations in those study components. A student who wishes to register for more study components must obtain permission from the Examination Committee.
- 2.** Voor onderwijseenheden geldt een uiterste aanmeldtermijn van vijf werkdagen voor aanvang van het eerste kwartiel en twintig werkdagen voor het tweede, derde en vierde kwartiel.

For study components there is a registration deadline of up to five working days before the first quarter and twenty working days before the second, third and fourth quarter.
- 3.** In uitzonderlijke gevallen heeft een onderwijseenheid een capaciteitsbeperking. De capaciteitsbeperking is zodanig dat in ieder geval studenten voor wie de onderwijseenheid deel uitmaakt van het verplichte deel van het examenprogramma, kunnen deelnemen. De onderwijseenheden met een capaciteitsbeperking worden na toestemming van de Dean GS uiterlijk 1 april voor kwartiel 1 en 2 en uiterlijk 1 oktober voor kwartiel 3 en 4 bekend gemaakt via de digitale studiegids.

In exceptional cases a study component may have a capacity limit. The capacity limit is such that there is capacity for all students for whom the study component is a mandatory part of the program of examinations. The study components for which there is a capacity limit are published in the digital education guide April 1 latest for quarters 1 and 2 and October 1 for quarters 3 and 4 after approval of the GS Dean.

Voor een onderwijseenheid met een capaciteitsbeperking is de aanmeldtermijn:

  - voor studenten voor wie het vak een verplicht onderdeel van het programma vormt, uiterlijk tien werkdagen voor de uiterste aanmeldtermijn van lid 2.
  - voor de overige studenten staat aanmelding vanaf tien werkdagen voor de uiterste aanmeldtermijn van lid 2 open.

The registration term for a study component with a capacity limit is as follows:

  - for students for whom the course is a mandatory part of the degree program, 10 working days latest before the last registration term of paragraph 2.
  - for other students, registration is open from 10 working days of the last registration term of paragraph 2.
- 4.** Studenten dienen zich, wanneer zij de onderwijseenheid toch niet willen volgen, voor aanvang van een kwartiel in OSIRIS af te melden voor een reeds aangemelde onderwijseenheid.

If students decide not to participate in a study component for which they have registered, they are required to deregister in OSIRIS before the start of a quarter.

**Art 3.8 Aanmelden voor onderwijseenheid na verstrijken aanmeldtermijn**

1. Wanneer een student bij het aanmelden voor een onderwijseenheid de in artikel 3.7 genoemde termijnen niet in acht heeft genomen, kan niet worden deelgenomen aan deze onderwijseenheid, tenzij de student uiterlijk voor 17.00 uur op donderdag voor de start van het onderwijs in het eerste kwartiel dan wel uiterlijk vijftien werkdagen voor de start van het onderwijs in het tweede, derde of vierde kwartiel een vergoeding van de administratiekosten van €20 per onderwijseenheid heeft betaald. Na betaling van de administratiekosten wordt de student meteen aangemeld, mits de capaciteit voor het betreffende vak niet is overschreden.
2. In overmachtsituaties, hetgeen ter beoordeling is van de directeur ESA, kan besloten worden dat de student die zich meldt na de in lid 1 genoemde termijnen, alsnog voor de onderwijseenheid wordt aangemeld. Daarnaast kan de directeur ESA de administratiekosten genoemd in lid 1 kwijtschelden.
3. In geval sprake is van een situatie zoals bedoeld in artikel 3.7, vierde lid, is geen vergoeding van de administratiekosten verschuldigd.
4. Wanneer de student door overmacht (toch) niet kan deelnemen aan een onderwijseenheid waarvoor de student reeds administratiekosten heeft betaald, worden deze aan de student gerestitueerd.

**Art 3.9 Vrij onderwijsprogramma**

1. Een student die is ingeschreven voor een opleiding kan zelf uit onderwijseenheden die door een universiteit worden verzorgd een

**Registering for a study component after the registration term**

A student who fails to register for a study component within the period specified in Article 3.7 shall not be allowed to participate in the study component, unless the student has paid administration costs totaling €20 per study component no later than 5.00pm on the Thursday prior to the beginning of teaching in the first quarter, or no later than fifteen working days prior to the beginning of teaching in the second, third or fourth quarter. After payment of the administration costs students are immediately registered unless the maximum capacity for a course has been reached.

In cases of force majeure, at the discretion of the ESA Director, it may be decided that the student who reports after the terms mentioned in paragraph 1 may nevertheless be registered for a study component. In addition, the ESA Director may waive the administration costs stated in paragraph 1.

In the case of a situation as described in Article 3.7, paragraph 4, no supplementary administration costs will be incurred.

In the case that (in the end) due to force majeure, the student cannot participate in a study component for which administration costs have already been paid, the fee will be refunded.

**Flexible degree program**

A student who is enrolled in a degree program may select study components from a university to compose a curriculum that involves a final examination, as referred to in Article 7.3h of the WHW.

onderwijsprogramma samenstellen waaraan een examen is verbonden, zoals bedoeld in artikel 7.3h, van de WHW.

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| <p>2. Een gemotiveerd verzoek tot toestemming voor het volgen van een vrij onderwijsprogramma wordt ten minste twaalf weken voor de aanvang van het desbetreffende onderwijs ingediend bij de examencommissie van de opleiding waar de student staat ingeschreven.</p> <p>3. De examencommissie besluit na ontvangst van het verzoek binnen de reactietermijn. Indien nodig wijst het College van Bestuur op verzoek van die examencommissie een examencommissie van een andere opleiding aan die met deze beslissing wordt belast.</p> <p>4. Een besluit om de toestemming niet te verlenen wordt door de examencommissie niet eerder genomen dan nadat de student in de gelegenheid is gesteld te worden gehoord. Het besluit wordt met redenen omkleed.</p> <p>5. Het besluit vermeldt de opleiding waartoe het vrije onderwijsprogramma behoort.</p> <p>6. De examencommissie kan in bijzondere gevallen, onder mededeling daarvan aan de student, van de in het derde lid gestelde termijn afwijken.</p> | <p>A substantiated request for permission to take a flexible program must be submitted to the Examination Committee of the program in which the student is enrolled no later than twelve weeks before the relevant teaching begins.</p> <p>The Examination Committee shall decide on the request within the response term. If necessary, at the request of the Examination Committee, the Executive Board can delegate this decision to the Examination Committee of another program.</p> <p>A decision not to grant the approval will only be taken by the Examination Committee after the student in question has been given an opportunity to be heard. The decision must be substantiated with arguments.</p> <p>The decision shall state the degree program to which the flexible curriculum is deemed to belong.</p> <p>The Examination Committee may deviate from the deadline set in paragraph 3 in special cases and must communicate this to the student.</p> |
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**Art 3.10 Vrijstelling**

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| <p>1. Studenten kunnen in aanmerking komen voor een vrijstelling (VR) indien de examencommissie heeft bepaald dat een onderwijseenheid niet hoeft</p> | <p><b>Exemption</b></p> <p>Students are eligible for an exemption (EX), if the Examination Committee has determined that a study component does not need to be taken</p> |
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te worden gevolgd vanwege het bepaalde in het vierde lid. Dit betekent dat de betreffende studiepunten worden toegekend zonder cijfer.

because of the stipulation in paragraph 4. This means the respective credits are allocated without a grade.

2. Een verzoek tot vrijstelling voor het afleggen van een tentamen, dan wel van een praktische oefening wordt schriftelijk bij de examencommissie ingediend.

A written request for an exemption from an examination, or a practical exercise must be submitted to the Examination Committee.

3. Het verzoek gaat vergezeld van de documenten die redelijkerwijze nodig zijn voor de beoordeling of de desbetreffende student vrijstelling kan worden verleend.

The request must include all documents reasonably needed for an assessment of whether the students in question can be granted an exemption.

4. De gronden waarop de examencommissie vrijstelling kan verlenen voor het afleggen van een bepaald tentamen, of van een praktische oefening hebben uitsluitend betrekking op het niveau, de inhoud en de kwaliteit van de eerder door de desbetreffende studenten behaalde tentamens, of examens, dan wel van de door studenten buiten het hoger onderwijs opgedane kennis, inzicht, vaardigheden of competenties.

The grounds on which the Examination Committee can grant an exemption for taking a particular examination, or for a practical exercise are exclusively related to the level, the content and the quality of the examinations the students in question have already passed, or to the students' knowledge, insight, skills or competencies acquired outside higher of education.

5. Er kan geen vrijstelling worden verleend voor een masteronderwijseenheid die als onderdeel van het curriculum in een bacheloropleiding is behaald. Wanneer deze reeds behaalde masteronderwijseenheid als verplicht onderdeel van een track binnen een masteropleiding geldt, dient de examencommissie voor die reeds behaalde masteronderwijseenheid een vervangend onderdeel binnen de masteropleiding aan te wijzen dan wel toestemming te verlenen voor een door studenten gekozen vervangende onderwijseenheid.

An exemption cannot be granted for a Master's study component passed as part of the curriculum of a Bachelor's program. If this Master's study component is a compulsory component of a certain track within a Master's program, the Examination Committee should indicate an alternative component within the track, or to provide permission for a substitute study component chosen by the students.

6. Voorts kunnen op verzoek van studenten reeds behaalde onderwijseenheden met behoud van cijfer en tentamendatum mee

In addition to the above, at the request of the students, study components successfully completed may be transferred to a different TU/e degree

worden genomen naar een andere TU/e opleiding, wanneer er sprake is van interne switchers dan wel omzwaaiers binnen de TU/e masteropleidingen.

program retaining the grade and date of examination, if this refers to transfer students or intra-university transfer students within TU/e Master's programs.

**7.** De examencommissie besluit na ontvangst van het verzoek om vrijstelling binnen de reactietermijn.

The Examination Committee shall decide on the request for exemption within the response term.

**8.** Een besluit om de vrijstelling niet te verlenen wordt door de examencommissie niet eerder genomen dan nadat studenten in de gelegenheid zijn gesteld te worden gehoord. Het besluit wordt met redenen omkleed.

A decision not to grant an exemption shall only be taken by the Examination Committee once the students have been given an opportunity to be heard. The decision must be substantiated with arguments.

**9.** Het besluit tot het verlenen van vrijstelling voor het afleggen van een tentamen of van een praktische oefening wordt gelijkgesteld met de beoordeling "voldoende" en aangeduid met: VR.

The decision to grant an exemption for taking an examination or a practical exercise shall correspond to the grade 'sufficient' and be marked: EX (exemption).

**10.** Voorwaarden voor het verlenen van vrijstellingen zijn opgenomen in het reglement van de examencommissie.

Conditions that apply to the granting of exemption are set out in the Regulations of the Examination Committee.

#### **H 4** HONORS ACADEMY

#### HONORS ACADEMY

**Art 4.1** Er is een honors programma voor studenten die een extra uitdaging willen. De regels omtrent dit programma zijn opgenomen in het reglement TU/e Honors Academy in masteropleidingen.

There is an honors program for students who want an additional challenge. The regulations pertaining to this program are incorporated in the TU/e Honors Academy Regulations for Master's Honors Tracks.

#### **H 5** TOETSING

#### TESTING

**Art 5.1** Frequentie, vorm en volgorde van tentamens

**Frequency, structure and sequence of examinations**



- 1.** Van de gelegenheden tot het afleggen van schriftelijke tentamens in het eerste en tweede kwartiel wordt jaarlijks, voor 15 augustus, door het faculteitsbestuur een tentamenrooster vastgesteld dat uiterlijk 15 augustus wordt bekendgemaakt.  
Van de gelegenheden tot het afleggen van schriftelijke tentamens in het derde en vierde kwartiel van de opleiding wordt jaarlijks vóór 15 december door het faculteitsbestuur een rooster vastgesteld dat uiterlijk 15 december wordt bekendgemaakt.

Annually, before August 15, the Department Board will determine a timetable for written examinations in the first and second quarter, which will be published no later than August 15.  
Annually, before December 15, the Department Board will determine a timetable for written examinations in the third and fourth quarter, which will be published no later than December 15.
- 2.** Het faculteitsbestuur kan in bijzondere gevallen tot uiterlijk acht weken voordat een schriftelijk tentamen plaatsvindt, afwijken van het in het vorige lid bedoelde rooster. De betrokken studenten worden door het faculteitsbestuur onder opgaaf van redenen onverwijld in kennis gesteld van de wijziging in het rooster.

In special cases, the Department Board may deviate from the timetable referred to in the previous paragraph, yet no later than eight weeks before the written examinations take place. The Department Board must inform the students of the change without delay, giving reasons.
- 3.** Mondeling af te nemen tentamens worden op een door de examiner, na zo veel mogelijk overleg met de student, te bepalen tijdstip afgenomen binnen het studiejaar waarin de student is ingeschreven voor de onderwijseenheid.

Examinations to be administered orally will be administered at a time determined by the examiner, wherever possible in consultation with the students in question, within the academic year in which students are registered for the study component.
- 4.** Tot het afleggen van de tentamens wordt per onderwijseenheid ten minste twee maal per studiejaar de gelegenheid geboden. De deadlines van de eerste en tweede gelegenheid voor inlevering/afroning van een praktische oefening als onderwijseenheid, worden bekendgemaakt via de studeerwijzer.

There shall be at least two opportunities per study component in each academic year to take exams. The deadlines for the first and second opportunity to submit/complete a final test of a practical exercise are published in the study guide.
- 5.** In afwijking van het bepaalde in het voorgaande lid, wordt tot het afleggen van een praktische oefening als onderwijseenheid zoals genoemd in bijlage 1 onder p, slechts eenmaal per studiejaar de gelegenheid geboden.

In derogation of the stipulations of the previous paragraph, only one opportunity is offered to take practical exercises as a study component as stated in Appendix 1 under p.

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| <p>6. Indien een onderwijseenheid uit een studieprogramma vervalt, wordt in het eerste studiejaar dat het onderwijs in die onderwijseenheid niet meer wordt verzorgd nog ten minste tweemaal de gelegenheid geboden het tentamen in die onderwijseenheid af te leggen.</p>   | <p>If a study component is removed from the curriculum, at least two more opportunities shall be given to take the examination in that study component during the first academic year in which the study component is no longer taught.</p>  |
| <p>7. Indien een onderwijseenheid uit een studieprogramma in een bepaald studiejaar niet wordt verzorgd, dan wordt in dat studiejaar ten minste tweemaal de gelegenheid geboden de onderwijseenheid af te ronden. Beide gelegenheden zijn uitsluitend mogelijk, wanneer het een herkansing betreft. Dit lid is niet van toepassing op competentiegerichte opleidingen.</p> | <p>If a study component from a degree program is not provided in a certain academic year, at least two opportunities are offered to complete the study component (see Article 5.11, paragraph 2, point 3 and Article 5.11, paragraph 3). Both opportunities are only possible when it concerns a resit. This does not apply to competency-centered programs.</p> |
| <p>8. De examencommissie kan besluiten in bijzondere gevallen af te wijken van het aantal malen dat een tentamen kan worden afgelegd, alsmede van de vorm en de volgorde waarin dat tentamen wordt afgelegd.</p>   | <p>In special cases, the Examination Committee may decide to deviate from the determined number of times an examination may be taken, and from the form and the sequence in which that examination is taken.</p>   |

#### **Art 5.2 Mondelinge tentamens**

1. Bij een mondeling tentamen wordt niet meer dan één student tegelijk getentamineerd.
2. Bij het afnemen van een mondeling tentamen zijn twee examenbevoegde docenten dan wel een examenbevoegde docent en een materiedeskundige aanwezig.
3. Het mondeling afnemen van tentamens is openbaar.
4. De examencommissie kan in bijzondere gevallen afwijken van het bepaalde in de leden 1 en 3 van dit artikel.

#### **Art 5.3 Deelname en aanmelding tentamens**

#### **Oral examinations**

- No more than one student shall be given an oral examination at a time.
- When an oral examination is taken, two authorized teachers or an authorized teacher and a subject specialist shall be present.
- Oral examinations shall be administered publicly.
- In special cases, the Examination Committee may deviate from the provisions in the paragraphs 1 and 3 of this article.

#### **Participation in and registration for exams**

- 1.** Studenten kunnen slechts deelnemen aan een tentamen van de opleiding indien zij zijn ingeschreven voor de opleiding, met inachtneming van de in bijlage 1, onder e, h en i, voorgeschreven volgtijdelijkheid.

Students must be enrolled in a degree program in order to take the examinations offered by that program, taking into account the sequence specified in Appendix 1 under e, h and i.
- 2.** De examencommissie kan bachelor- en schakelstudenten toestemming verlenen het onderwijs te volgen behorende bij specifieke masteronderwijseenheden zonder voor die masteropleiding te zijn ingeschreven, wanneer voldaan wordt aan de eisen zoals gesteld in artikel 5.2 van de OER van de bacheloropleiding. Voor deelname aan het tentamen is het volgende lid van overeenkomstige toepassing. Zie ook artikel 2.2 van deze OER.

The Examination Committee may grant permission to Bachelor's and pre-Master's students to take specific Master's components without being enrolled in that program, as long as the requirements have been met as stated in Article 5.2 of the Program and Examination Regulations of the Bachelor Program. The following paragraph shall apply mutatis mutandis to participation in the examination. See also Article 2.2 of these Program and Examination Regulations.
- 3.** Voor een tentamen geldt dat inschrijving voor de betreffende onderwijseenheid automatisch leidt tot aanmelding voor het eerstvolgende tentamen.

In alle andere gevallen dienen studenten die aan een tentamen wensen deel te nemen, zich vóór de datum van het tentamen via OSIRIS in te schrijven. Voor centraal georganiseerde schriftelijke tentamens geldt dat zij zich uiterlijk tien werkdagen voor de desbetreffende tentamenperiode daarvoor aanmelden via OSIRIS. De aanmelding voor deze tentamens is mogelijk vanaf tenminste 15 augustus voorafgaand aan het studiejaar voor het eerste en tweede kwartiel en 15 december voor het derde en vierde kwartiel. De aanmeld- en sluitdata worden jaarlijks door ESA centraal bekend gemaakt.

For an examination registration for the study component in question automatically results in registration for the first opportunity to take the examination.

In all other cases, students wishing to take part in an examination must register through OSIRIS before the examination date. For centrally organized written examinations students must register through OSIRIS, no later than ten (10) working days before the scheduled date of the relevant examination period. Students can register for examinations from at least August 15 preceding the start of the academic year for the first and second quarter and December 15 for the third and fourth quarter. The registration and closing dates shall be made known annually by ESA.
- 4.** Studenten zijn verplicht zich voorafgaand aan of tijdens het tentamen op verzoek van de examinatoren dan wel surveillanten te legitimeren met hun campuskaart.

Students are obliged, before or during the examination, and at the request of the examiner or the invigilator, to identify themselves by showing their campus card.

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| <p><b>5.</b> Bij gebreke van een campuskaart kunnen studenten zich ook identificeren met een geldig legitimatiebewijs. Wanneer studenten hiertoe niet in staat zijn, mogen zij niet deelnemen aan het tentamen.</p>   | <p>Students who do not bring a campus card can also identify themselves using a valid means of identification. Students who are unable to do this, will not be permitted to take part in the examination.</p>  |
| <p><b>6.</b> Studenten die reeds vier keer een tentamen zonder goed gevolg (waaronder ook de in artikel 5.6 lid 5 vastgelegde tentamenuitslagen) hebben afgelegd, dienen voorafgaand aan de daarop volgende keer dat zij zich voor dat tentamen wensen aan te melden met de studieadviseur afspraken te maken over hun studie-aanpak aan de hand van een door studenten opgesteld individueel studieplan.</p> | <p>Students who have already taken an examination four times, without passing (including the exam results, as stipulated in Article 5.6, paragraph 5), should consult with the academic advisor before registering for the examination in question again, to discuss how the problem is to be addressed on the basis of a study plan drawn up by the students.</p> |
| <p><b>7.</b> Het zich aanmelden voor een tentamen maar niet verschijnen of het gemaakte tentamenwerk voor de deadline niet inleveren wordt voor toepassing van het zesde lid, beschouwd als het niet met goed gevolg hebben afgelegd van het tentamen.</p>  | <p>For implementation of paragraph 6 of this article, students who register for an examination but fail to turn up, or who do not hand in the completed examination work before the deadline, will be deemed to have failed the examination.</p>   |
| <p><b>8.</b> Het werk van studenten die zonder zich te hebben aangemeld deelnemen aan een tentamen, wordt niet beoordeeld. De student wordt beschouwd als niet te hebben deelgenomen aan het tentamen.</p>  | <p>The work of students who take part in an examination without having registered for it will not be assessed. In such cases, the students shall be deemed not to have taken the examination.</p>  |
| <p><b>9.</b> Indien er sprake is van bijzondere persoonlijke redenen waarom studenten zich niet tijdig hebben aangemeld voor deelname aan een tentamen, kan de examencommissie besluiten dat de examiner het ingeleverde werk toch moet beoordelen.</p>   | <p>If there are extenuating personal circumstances that prevented the students from registering for the examination in time, the Examination Committee can decide that the examiner must assess the students' work after all.</p>  |
| <p><b>10.</b> De examencommissie stelt vast of studenten voldoen aan de voorwaarden voor toelating tot een tentamen.</p>  | <p>The Examination Committee determines whether students fulfill the conditions for admission to the examination.</p>  |

- 11.** Ter vervanging van een centraal georganiseerd schriftelijk tentamen kan de examencommissie in bijzondere omstandigheden studenten een vervangend tentamen toestaan.
- Art 5.4 Aanmelden voor tentamens na verstrijken aanmeldtermijn**
- 1.** Wanneer een student bij het aanmelden voor een tentamen de in artikel 5.3, derde lid, genoemde termijn niet in acht heeft genomen, kan niet worden deelgenomen aan dat tentamen, tenzij de student uiterlijk 5 werkdagen voor de tentamenperiode een vergoeding van de administratiekosten van € 20 per onderwijseenheid heeft betaald. Na betaling van de administratiekosten wordt de student meteen aangemeld.
- 2.** In overmachtsituaties, hetgeen ter beoordeling is van de directeur ESA, kan besloten worden dat de student die zich aanmeldt na de in lid 1 genoemde termijnen, alsnog voor het tentamen wordt aangemeld. Daarnaast kan de directeur ESA de administratiekosten genoemd in lid 1 kwijtschelden.
- 3.** Wanneer de student door overmacht (toch) niet kan deelnemen aan een tentamen waarvoor de student reeds administratiekosten heeft betaald, worden deze gerestitueerd.
- Art 5.5 Terugtrekking**
- 1.** Studenten kunnen zich na aanmelding uiterlijk vijf werkdagen voor de tentamenperiode terugtrekken door middel van mededeling daarvan aan ESA via ESAhelpdesk@tue.nl.
- In exceptional circumstances, the Examination Committee can permit students to take an alternative examination to the centrally organized examination.
- Registering for exams after the registration period has passed**
- Students who fail to register for an exam within the period specified in Article 5.3 paragraph 3 shall not be allowed to participate in the exam, unless the students have paid administration costs totaling € 20 per study component no later than five working days before the examination period. After payment of the administration costs the students are immediately registered.
- In cases of force majeure, at the discretion of the ESA Director, it may be decided that students who register after the terms mentioned in paragraph 1 may nevertheless be registered for an exam. In addition, the ESA Director may waive the administration costs stated in paragraph 1.
- In the case that students cannot participate (after all) in a study component, due to force majeure, for which they have already paid administration costs, the fee will be refunded.
- Withdrawal**
- After registering for an examination, students can withdraw no later than five working days before the examination period, by notifying ESA through ESAhelpdesk@tue.nl.

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| <p><b>2.</b> Terugtrekking voor een tentamen korter dan vijf werkdagen voor de tentamenperiode wordt voor de toepassing van artikel 5.3, zesde lid, beschouwd als het niet met goed gevolg hebben afgelegd van dit tentamen.</p>                     | <p>With reference to Article 5.3, paragraph 6, students who withdraw within five working days before the examination period shall be deemed to have failed this examination.</p>   |
| <p><b>Art 5.6 Beoordeling van tentamens</b></p>  | <p><b>Assessment of examinations</b></p>   |
| <p><b>1.</b> Beoordeling van tentamens en praktische oefeningen vindt plaats door een (of meerdere) examiner(en).</p>  | <p>The assessment of examinations and practical exercises is carried out by one or more examiners.</p>   |
| <p><b>2.</b> De vaststelling van het resultaat van tentamens en praktische oefeningen geschiedt per individuele student, waarbij dit verdeeld kan zijn in een aantal componenten.</p>  | <p>The results of examination and practical exercises will be determined for individual students, and may be divided into a number of components.</p>  |
| <p><b>a.</b> De beoordeling van een tentamen, alsmede van het onderzoek, genoemd in artikel 6.1, tweede lid, wordt uitgedrukt in hele getallen volgens de beoordelingsschaal 0 t/m 10 dan wel met een 'vrijstelling' (VR) of Niet Voldaan (NVD).</p> | <p>The assessment of an examination, as well as the investigation mentioned in Article 6.1, paragraph 2, shall be expressed in whole numbers on a scale of 0 to 10 or with "exemption" (EX) or Not met requirements (NMR).</p> |
| <p><b>b.</b> De beoordeling van praktische oefeningen wordt uitgedrukt in tienden, in halve getallen dan wel in Onvoldoende (ON), Voldoende (VO), Goed (GO), Zeer Goed (ZG), Gedaan (GN) of Niet Verschenen (NV).</p>                                | <p>The assessment of practical exercises is expressed in tenths, in half numbers, or using the designations Failed (FL), Sufficient (PA), Good (GO), Very Good (VG), Done (DN), or No Show (NS).</p>                           |
| <p><b>c.</b> Niet van toepassing.</p>  | <p>Not applicable.</p>   |
| <p><b>d.</b> Wanneer het tentamen verdeeld is in een aantal componenten, blijkt uit de course catalogue welke componenten dat zijn en op welke wijze zij meetellen voor de berekening van het eindcijfer.</p>  | <p>If the exam is divided into a number of components, the subject description in the course catalogue shall describe those components and indicate how they count with respect to the final grade.</p>                        |
| <p><b>e.</b> De beoordeling van het afstudeerproject wordt uitgedrukt op halve getallen nauwkeurig op de beoordelingsschaal 0 t/m 10. Het</p>  | <p>The assessment of the graduation project shall be rounded to the nearest half grade on a scale of 0 to 10. The graduation project is considered</p>   |

afstudeerproject is met goed gevolg afgelegd indien het is beoordeeld met een eindcijfer 6 of hoger (een beoordeling met een eindcijfer 5.5 of lager betekent niet met goed gevolg afgelegd). De beoordeling van de professionele vaardigheden die tijdens het afstuderen afgerond worden, maakt onderdeel uit van de beoordeling van het afstudeerproject. In de studeerwijzer is vermeld of en op welk moment tussentijdse evaluaties van het afstudeerproject plaatsvinden.

successfully completed if it is assessed with a final grade of 6 or more (an assessment with a grade of 5.5 or lower means not successfully completed). The assessment of professional skills that are completed during graduation are part of the assessment of the graduation project. The study guide indicates if and when interim evaluations of the Master's thesis take place.

- f.** Het voldoen aan de vereisten van professionele vaardigheden alsmede het behaald hebben van alle onderwijseenheden behorende bij het examenprogramma, is een formele voorwaarde om toegelaten te worden tot de beoordeling van het afstudeerproject. Meeting the requirements of professional skills as well as having passed all study components belonging to the program of examinations, is a formal requirement for admission to assessment of the graduation project.
- 3a.** Een tentamen is met goed gevolg afgelegd, indien het is beoordeeld met een cijfer 6 of hoger, dan wel wanneer daarvoor een VR is verleend. Students pass an examination by scoring a 6 or higher on the examination or with a grade of EX (exemption).
- b.** Een praktische oefening als onderwijseenheid is met goed gevolg afgelegd, indien het is beoordeeld met een cijfer 6 of hoger respectievelijk VO, GO, ZG of GN, dan wel wanneer daarvoor een vrijstelling, VR, is verleend. Students pass a practical exercise as a study component if the grade is 6 or higher, or with an assessment of PA, GO, VG or DN or, in the case of an exemption, EX.
- 4.** Indien studenten zich wel voor een tentamen hebben aangemeld, maar niet zijn verschenen, of zich niet tijdig hebben teruggetrokken, wordt de tentamenuitslag voor de toepassing van artikel 5.3, zevende lid, beschouwd als het niet met goed gevolg hebben afgelegd van een tentamen en wordt de uitslag aangeduid met 'niet verschenen' (NV). Het eindcijfer is dan 'Niet Voldaan' (NVD). If students register for an examination but fail to appear, have not withdrawn in time, they will be deemed to have failed the examination under the provisions of paragraph 5 of Article 5.3, paragraph 7, and the examination result will be marked as a "No Show" (NS). The final grade then is 'Not met requirements' (NMR).

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| <p>5. Indien de examencommissie heeft vastgesteld dat een student heeft gefraudeerd, zoals bedoeld in hoofdstuk 3 van het Reglement van de Examencommissie, kan/kunnen de tentamenuitslag 'ongeldig' (ONG) worden verklaard..</p> <p>6. De beoordelingsnormen worden uiterlijk bij aanvang van de tentamens, of de praktische oefeningen als onderwijseenheid bekend gemaakt. Voor de aanvang van een tentamen wordt de puntenverdeling van een tentamen bij de vragen bekendgemaakt. In bijzondere gevallen kan de examinator besluiten de puntenverdeling achteraf aan te passen.</p> <p>7. De wijze van beoordeling is zodanig dat studenten kunnen nagaan hoe de uitslag van de tentamens, of praktische oefeningen als onderwijseenheid tot stand is gekomen.</p> <p>8. De examencommissie is bevoegd individueel dan wel voor alle studenten die op dat moment het tentamen hebben afgelegd, een tentamen ongeldig te verklaren wanneer er sprake is van ernstige onregelmatigheden.</p> | <p>If the examination committee has established that a student has committed fraud, as referred to in Chapter 3 of the Regulations of the Examination Committee, the exam result may be declared 'invalid' (INV).</p> <p>The assessment standards are announced no later than immediately before the start of the examinations, or the practical exercises as a study component. The weight of the individual questions will be announced immediately before the start of a written test or an examination. In exceptional cases, the examiner may decide to adjust the weight of the questions after the examination.</p> <p>The method of assessment should enable students to ascertain how the results of the examinations, or the practical exercises as a study component were determined.</p> <p>The Examination Committee has the authority to declare an examination invalid for individual students or for all students who took the exam at that time in case of serious irregularities.</p> |
| <p><b>Art 5.7 Vaststelling uitslag / nakijktermijnen</b></p> <p>1. De examinatoren stellen de uitslag van een schriftelijk tentamen op een zodanig moment vast dat uiterlijk binnen vijftien werkdagen na afloop van het tentamen het eindcijfer geregistreerd is in OSIRIS.</p> <p>2. De examinatoren stellen niet later dan één dag na het afnemen van een mondeling tentamen de uitslag vast en delen deze direct mede aan de studenten.</p>  | <p><b>Determining results/marking periods</b></p> <p>The examiners shall determine the result of a written examination as soon as possible but no later than 15 working days after the examination has taken place such that the final grade is recorded in OSIRIS.</p> <p>The examiners shall determine the results of an oral examination no more than one day later and will communicate these immediately to the students.</p>  |



3. Ten aanzien van een op andere wijze dan mondeling of schriftelijk af te leggen tentamen bepaalt de examencommissie tevoren op welke wijze en binnen welke termijn studenten in kennis worden gesteld van de uitslag.

In the case of examinations taken in other than oral or written form, the Examination Committee shall determine beforehand how and within what period the students will receive a written statement giving the result.
4. De examinatoren stellen de uitslag van een praktische oefening als onderwijseenheid zo spoedig mogelijk doch uiterlijk binnen vijftien werkdagen na ontvangst ervan vast dan wel, wanneer een deadline is afgesproken, vijftien werkdagen na die deadline en delen het (eind)cijfer mede aan de studenten.

Wanneer voor de inlevering van een praktische oefening een termijn of datum is bepaald en wanneer de studenten vanwege bijzondere persoonlijke omstandigheden een praktische oefening niet tijdig hebben ingeleverd, kan de examencommissie, op verzoek van de studenten, besluiten die praktische oefening toch te laten beoordelen.

The examiners will determine the result of a practical exercise that serves as a study component as soon as possible, but no later than fifteen working days after it has been submitted or, if a deadline has been agreed, fifteen working days after this deadline, and they will communicate the mark (or final mark) to the students.

If a term or date has been determined for the submission of a practical exercise and if the students have not submitted the practical exercise on time due to extenuating personal circumstances, the Examination Committee can, on the students' requests, decide to have the practical exercise assessed anyway.
5. Indien de desbetreffende examinatoren door bijzondere omstandigheden niet in staat zijn te voldoen aan het bepaalde in de voorgaande leden, melden zij dit met redenen omkleed aan de examencommissie. De betrokken studenten worden door de examencommissie onverwijld van de vertraging op de hoogte gesteld, onder vermelding van de termijn waarbinnen de uitslag alsnog bekend wordt gemaakt.

If the examiners in question are unable to meet the requirements in the previous paragraphs due to special circumstances, they shall notify the Examination Committee, stating the reasons. The students involved will immediately be informed of the delay by the Examination Committee, and of the term within which the results will be made known.
6. Van de uitslag van een tentamen wordt door of namens de examencommissie aan de studenten schriftelijk dan wel elektronisch een verklaring uitgereikt.

Students shall be informed of the result of the examination by or on behalf of the Examination Committee, in written or electronic form.
7. Bij de uitslag van een tentamen worden de studenten gewezen op het inzage-recht, als bedoeld in artikel 5.8, en de mogelijkheid tot

When they receive their results, students will be informed of their rights of inspection, as referred to in Article 5.8, the opportunity to evaluate the

nabespreking, als bedoeld in artikel 5.9, alsmede op de beroepsmogelijkheid bij het College van Beroep voor de Examens.

examination, as referred to in Article 5.9, and the opportunity to submit an objection to the Examination Appeals Board.

8. Indien er sprake is van buitengewone omstandigheden kan de examinator een eerder vastgesteld en bekendgemaakt tentamencijfer binnen vier weken na bekendmaking, aanpassen, welke aanpassing zowel in het voor- als nadeel van studenten kan zijn.

In the case of exceptional circumstances, the examiner may alter the grade of an examination previously determined within four weeks of its initial announcement both to the advantage or disadvantage of the students.

Wanneer de bijstelling van een eindcijfer gevolgen heeft voor de afronding van de masteropleiding of een reeds uitgereikt getuigschrift dient de examinator in overleg met de examencommissie een beslissing te nemen.

If the alteration to the final grade has consequences for the completion of the Master's program or for a certificate already issued, the examiner must consult the Examination Committee before taking a decision.

9. Voor de datering van een tentamen geldt de datum waarop het schriftelijke tentamen is gehouden, of het mondeling tentamen is afgelegd. Voor de datering van een tentamen in de vorm van een praktische oefening geldt de datum waarop het verslag definitief is ingeleverd dan wel de presentatie is gehouden, dan wel, indien er geen sprake is van een verslag of een presentatie, de praktische oefening is afgerond.

The examination will be dated in accordance with the date on which the written or oral examination is administered. An examination in the form of a practical exercise shall be dated in accordance with the date on which the final report is submitted or the date of the presentation, or, if there is no report or final presentation, the day on which the practical exercise is completed.

10. De uitslagen, zoals bedoeld in dit artikel, moeten in OSIRIS vastgelegd worden.

The results, as referred to in this article, must be recorded in OSIRIS.

#### **Art 5.8 Inzagerecht schriftelijke tentamens**

#### **Right of inspection for written examinations**

1. Gedurende ten minste twintig werkdagen na de bekendmaking van de uitslag van een schriftelijk tentamen krijgen studenten op hun verzoek inzage in hun beoordeelde werk. Op verzoek van de studenten wordt een kopie van het beoordeelde werk verstrekt.

Students shall be given the opportunity, on request, to inspect their assessed work up to at least 20 working days after the announcement of the result of a written examination. At the students' request, a copy of the assessed work will be provided.

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| <p>2. Gedurende de termijn genoemd in het eerste lid kan elke belanghebbende op verzoek kennisnemen van de vragen en opdrachten van het desbetreffende tentamen alsmede van de normen aan de hand waarvan de beoordeling heeft plaatsgevonden.</p>                    | <p>During the term mentioned in paragraph 1, any interested person may, on request, inspect the questions and assignments of a given examination, as well as the standards on which the assessment was based.</p>  |
| <p>3. De examiner maakt, binnen vijf werkdagen nadat het desbetreffende verzoek is ontvangen, bekend op welke plaats en tijd de in het eerste en tweede lid bedoelde inzage of kennisneming geschiedt.</p>  | <p>Within five working days after the request for inspection has been received, the examiner shall announce the venue and the time of the inspection referred to in paragraphs 1 and 2.</p>  |
| <p>4. Indien studenten of belanghebbenden aantonen buiten hun schuld verhinderd te zijn of te zijn geweest op de vastgestelde plaats en tijd te verschijnen, wordt hen een andere mogelijkheid geboden, zo mogelijk binnen de in het eerste lid genoemde termijn.</p> | <p>If students or interested persons can prove that they were prevented from appearing at the fixed place and time through no fault of their own, they shall be offered another opportunity, if possible within the term mentioned in paragraph 1 of this article.</p> |

**Art 5.9 Nabespreking**

Zo spoedig mogelijk na de bekendmaking van de uitslag van een mondeling tentamen vindt op verzoek van de studenten dan wel op initiatief van de examiner een nabespreking plaats tussen de examiner en de student. In dat geval wordt de gegeven beoordeling gemotiveerd. Een examiner kan een collectieve nabespreking beleggen.

**Evaluation**

As soon as possible after the announcement of the result of an oral examination, at the request of the students concerned or on the initiative of the examiner, an evaluation will take place between the examiner and the student. In such cases, the assessments given shall be substantiated. An examiner can organize a collective evaluation.

**Art 5.10 Geldigheidsduur en bewaartermijnen**

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| <p>1. De geldigheidsduur van een tentamenresultaat is in beginsel onbeperkt.</p>   | <p>In principle, examination results are valid for an unlimited period.</p>   |
| <p>2. De examencommissie kan echter, wanneer een tentamenresultaat ouder is dan zes jaar en de getentamineerde kennis of het getentamineerde inzicht aantoonbaar verouderd is, of indien de getentamineerde vaardigheden</p> | <p>If an examination result is older than six years and the examined knowledge or examined insight is demonstrably dated, or if examined skills are demonstrably dated, however, the Examination Committee may require that the students take a supplementary or alternative examination.</p> |

aantoonbaar verouderd zijn, een aanvullend of een vervangend tentamen opleggen.

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| <p><b>3.</b> Beoordeelde schriftelijke tentamens dienen gedurende ten minste twee jaren na vaststelling van de uitslag te worden bewaard, met uitzondering van huiswerkopdrachten.</p> <p><b>4.</b> (Driedimensionale) werkstukken dienen gedurende ten minste zes weken na vaststelling van het cijfer, doch in ieder geval gedurende een eventuele bezwaar- en beroepsprocedure te worden bewaard.</p> <p><b>5.</b> Stageverslagen, afstudeerverslagen, en portfolio's, die zijn vervaardigd met het oog op het afsluiten van de masteropleiding, dienen gedurende ten minste zeven jaar te worden bewaard.</p> | <p>Written examinations must be retained for at least two years following determination of the grade, with the exception of homework assignments.</p> <p>(Three-dimensional) projects must be retained for at least six weeks after the grade has been determined but, in any event, for the duration of any objection and appeal procedures.</p> <p>Internship reports, graduation reports, portfolios, produced in completion of the Master's program must be retained for at least seven years.</p> |
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## **H 6 EXAMENS**

### **Art 6.1 Examen**

- 1.** De examencommissie stelt de uitslag van het examen vast en reikt het getuigschrift als bedoeld in artikel 6.3 uit, zodra de student aan de eisen van het examenprogramma heeft voldaan. De examencommissie nodigt de student uit voor een zitting om tot uitreiking van het getuigschrift over te gaan, tenzij de student op grond van het vijfde lid de examencommissie heeft verzocht dit uit te stellen. De uitslag van het examen is 'geslaagd' dan wel 'teruggetrokken met behoud van de behaalde resultaten'. Indien studenten een tentamen meer dan eenmaal hebben afgelegd, neemt de examencommissie voor de vaststelling van de uitslag van het examen het hoogst behaalde resultaat in aanmerking.

## **FINAL EXAMINATIONS**

### **Final examinations**

The Examination Committee determines the results of the final exam and issues the certificate as referred to in Article 6.3 as soon as the students have met the requirements of the examination. The Examination Committee invites the students for a meeting to issue the degree certificate unless, on the grounds of paragraph 5, the student has asked the Examination Committee to delay awarding the certificate. The result of the final examination shall be "passed" or "withdrawn and the results attained shall be retained". If students have taken an examination more than once, the Examination Committee shall take into account the highest grade obtained in determining the result of the final examination.

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| <p><b>2.</b> Beoordeling van het examendossier maakt deel uit van het examen. Als datum voor het examen geldt de datum waarop een student de laatste onderwijsactiviteit heeft verricht (zie artikel 5.7, negende lid).</p>  | <p>Assessment of the examination dossier is part of the final examination. The date of the final examination shall be the date on which the students carried out the final program activity (see Article 5.7, paragraph 9).</p>  |
| <p><b>3.</b> Voor het behalen van het examen geldt als voorwaarde dat voor alle onderdelen een voldoende cijfer en/of Promotion- (P) of Promotion met excellentie (E) is behaald, met inachtneming van de verleende vrijstellingen en de compensatieregeling uit artikel 4.2 van het Reglement van de examencommissie. De examencommissie kan onder door haar te stellen voorwaarden bepalen dat niet ieder tentamen met goed gevolg hoeft te zijn afgelegd om vast te kunnen stellen dat het examen met goed gevolg is afgelegd (zie artikel 4.3 van het Reglement van de Examencommissie). Voor de bijbehorende professionele vaardigheden kunnen studenten vrijstelling aanvragen bij de examencommissie.</p> | <p>In order to pass the final examination, the students must obtain the 'sufficient' grade and/or Promotion- (P) or Promotion with excellence (E) for all components, in compliance with the exemptions granted and the compensation arrangement from Article 4.2 of the Regulations of the Examination Committee. The Examination Committee can determine, under conditions established by the Committee itself, that not every examination has to be passed in order for students to pass the final examination (see Article 4.3 of the Regulations of the Examination Committee). For the corresponding professional skills, students can apply for exemption from the Examination Committee.</p> |
| <p><b>4.</b> Voor het behalen van het examen en de afgifte van het getuigschrift geldt tevens als voorwaarde dat studenten ingeschreven waren voor de betreffende TU/e-opleiding in de periode dat de tentamens zijn afgelegd.</p>   | <p>A further condition for passing the examination and receiving the degree certificate is that the students were enrolled for the TU/e degree program in question at the time the examinations were taken.</p>  |
| <p><b>5.</b> Degene die het examen met goed gevolg heeft afgelegd en aanspraak maakt op uitreiking van een getuigschrift, kan de examencommissie verzoeken daartoe nog niet over te gaan. Dit verzoek moet worden ingediend binnen twee weken nadat de student op de hoogte is gebracht van de uitslag van het examen. Bij dit verzoek geven de studenten aan wanneer zij het getuigschrift willen ontvangen. De examencommissie willigt het verzoek in ieder geval in wanneer studenten:</p> <ul style="list-style-type: none"><li>- extra onderwijseenheden willen volgen, die opgenomen worden op het diplomasupplement, en/of</li></ul>  | <p>Students who have passed the final examination, and are eligible for the award of a degree certificate, can ask the Examination Committee to delay awarding it. This request must be submitted no later than two weeks after the students have been informed of the final examination result. The request must specify when the students wish to receive the degree certificate. The Examination Committee shall in any event comply with the request if the following situations apply:</p> <ul style="list-style-type: none"><li>- the students are planning to take an extra study component that will be included in the diploma transcript, and/or</li></ul>                                 |

- cum laude willen afstuderen en voor enkele onderwijseenheden nogmaals tentamen willen afleggen.

- the students want to try to graduate with the cum laude classification and want to re-take examinations for certain study components to this end

#### **Art 6.2 Frequentie examen**

Tot het afleggen van het examen wordt maandelijks de gelegenheid gegeven, met uitzondering van de maand juli. Competentiegerichte opleidingen bieden tweemaal per jaar de gelegenheid tot het afleggen van het examen. De data van de zittingen van de examencommissies worden voor aanvang van het studiejaar door de examencommissie bekend gemaakt.

#### **Frequency of final examinations**

There shall be monthly opportunities to take the examination with the exception of July. Competency-centered programs offer two opportunities per year to take the final examination. The dates of the Examination Committee sessions shall be announced by the Examination Committee before the beginning of the academic year.

#### **Art 6.3 Getuigschrift en supplement**

1. De uitreiking van het getuigschrift per opleiding geschiedt in het openbaar, tenzij de examencommissie in bijzondere gevallen anders bepaalt.
2. Op het getuigschrift worden in ieder geval de gegevens vermeld als genoemd in artikel 7.11, tweede lid, van de WHW, alsmede, indien van toepassing, de kwalificatie van artikel 6.4, van deze regeling.
3. Aan de student wordt bij de uitreiking van het getuigschrift tevens een supplement uitgereikt. Per opleiding wordt per student één getuigschrift uitgereikt.
4. Op het supplement worden de gegevens vermeld als genoemd in artikel 7.11, derde lid, van de WHW, alsmede de cijfers behaald voor de onderdelen van het examen, en desgevraagd tevens andere niet tot het examen behorende onderwijseenheden, mits de student de tentamens,

#### **Certificate and transcript**

The degree certificates for each program shall be awarded in public unless, in exceptional cases, the Examination Committee decides otherwise.

The degree certificate shall, in any event, contain the information specified in Article 7.11, paragraph 2, of the WHW, together with the qualifications specified in Article 6.4 of these regulations.

When the degree certificate is awarded, the student shall also receive a transcript. One degree certificate is awarded per student for each degree program.

The transcript shall contain the information specified in Article 7.11, paragraph 3, of the WHW, as well as the grades obtained for parts of the final examination and, if required, for other study components that are not part of the examination, if the students in question have passed the

die aan die onderwijseenheden zijn verbonden, met goed gevolg heeft afgelegd voordat de examencommissie de uitslag van het examen heeft vastgesteld. Indien van toepassing wordt op het supplement vermeld voor welke schoolvakken en voor welk voortgezet onderwijs de student bevoegd is les te geven (artikel 33 en 36 van de Wet op het voortgezet onderwijs).

examinations for those study components before the Examination Committee determines the final examination result.

If applicable the transcript shall state for which school subjects and for which level of secondary education the holder is authorized to teach (Article 33 and 36 of the Secondary Education Act).

#### **Art 6.4 Bijzondere kwalificaties masteropleiding**

#### **Special qualifications for the Master's program**

1. De examencommissie reikt het getuigschrift 'cum laude' uit aan studenten die vóór 1 september 2019 met de opleiding zijn gestart, wanneer:
  - het rekenkundig gemiddelde van de beoordelingen van de door de studenten afgelegde onderwijseenheden die tot het examenprogramma behoren, 8,0 of hoger is, én
  - het afstudeerproject met een cijfer 9,0 of hoger is beoordeeld, én
  - geen van de afgelegde onderwijseenheden die tot de opleiding behoren zijn beoordeeld met een cijfer lager dan een 6,0.
  
2. De examencommissie reikt het getuigschrift 'met grote waardering' uit aan studenten die vóór 1 september 2019 met de opleiding zijn gestart, wanneer het rekenkundig gemiddelde van de beoordelingen van de door de student afgelegde onderwijseenheden die tot het examenprogramma behoren, 7,50 of hoger is, alsmede het afstudeerproject met een cijfer 8,0 of hoger is beoordeeld. Verder mag geen van de afgelegde onderwijseenheden die tot het examenprogramma behoren beoordeeld zijn met een cijfer lager dan een 6,0.

The Examination Committee may award the classification "cum laude" to certificates of students who started their degree programs before September 1, 2019 under the following conditions:

- they achieve an mathematical average of 8.0 or higher for the assessments of study components that belong to the program of examinations, and
- a grade of 9.0 or higher for the graduation project, and
- none of the study components belonging to the degree program may have a grade lower than a 6.0.

The Examination Committee may award the classification "with great appreciation" to students who started their degree program before September 1, 2019 if they achieve a mathematical average of 7.50 or higher for the assessment of study components that belong to their program of examinations, with the additional requirement that the graduation project must have a grade of 8.0 or higher. In addition, none of the study components that are part of the program of examinations may have a grade lower than a 6.0.

- 3.** De examencommissie reikt het getuigschrift ‘cum laude’ uit aan studenten die op of na 1 september 2019 met de opleiding zijn gestart, wanneer:
- het gewogen (op basis van studiepunten) rekenkundig gemiddelde is een niet-afgeronde 8,0 of hoger, met betrekking tot de door de student afgelegde onderwijseenheden die tot het examenprogramma behoren, met uitzondering van het afstudeerproject, én
  - het afstudeerproject met een cijfer 9,0 of hoger is beoordeeld, én
  - geen van de onderwijseenheden die tot het examenprogramma behoren zijn beoordeeld met een eindcijfer lager dan een 6, én
  - het examen binnen 32 maanden na aanvang van de opleiding is afgelegd.
- De examencommissie kan in bijzondere gevallen van dit laatste vereiste afwijken. Bij de beoordeling van het verzoek van de student kan de examencommissie rekening worden gehouden met de persoonlijke omstandigheden zoals genoemd in bijlage 2, artikel 5, van deze regeling.

The Examination Committee may award the classification “cum laude” to students who started their degree programs on or after September 1, 2019 under the following conditions:

- they achieve a weighted mathematical average (based on credits) that is a unrounded 8.0 or higher in relation to the study components takes by students that belong to the program of examinations, with exception of the graduation project,
- they have a grade of 9.0 or higher for the graduation project, and
- none of their study components belonging to the program of examinations has a final grade lower than a 6 and
- they must finish the final examination within 32 months of the commencement of the degree program.

The examination committee may deviate from this latter requirement in special cases. To assess the student’s request, the Examination Committee can take into account the extenuating personal circumstances as referred to in Appendix 2, Article 5 of these regulations.

## **H 7           STUDIEBEGELEIDING EN STUDIEVOORTGANG**

### **Art 7.1       Studiebegeleiding**

- 1.** Het faculteitsbestuur draagt zorg voor studiebegeleiding van de studenten, mede ten behoeve van de oriëntatie op tracks binnen of buiten de opleiding, zulks onder meer door middel van benoeming van één of meer studieadviseurs.

## **STUDY COUNSELING AND STUDY PROGRESS**

### **Study counseling**

The Department Board shall provide counseling to students for several matters, including orientation on tracks and other options inside or outside the degree program, including appointing one or more academic advisors.



2. De studieadviseur adviseert studenten gevraagd of ongevraagd over alle aspecten van hun opleiding en draagt, mede aan de hand van de studievoortgang en indien daar aanleiding toe is, zorg voor adequate verwijzing naar bevoegde organen van de TU/e, naar studentenadviseurs en/of studentendecanen van ESA of naar vertrouwenspersonen van de TU/e.

#### **Art 7.2 Bewaking van de studievoortgang**

1. Het faculteitsbestuur draagt zorg voor registratie en tijdige bekendmaking van de tentamenresultaten van de individuele studenten in OSIRIS.
2. In voorkomende gevallen zorgt het faculteitsbestuur voor bespreking van de resultaten tussen de student en de studieadviseur van de opleiding die de student volgt.
3. Bij grote studievertraging wijst de studieadviseur de desbetreffende studenten op de mogelijkheden voor extra ondersteuning en manieren om verdere vertraging zo beperkt mogelijk te houden.

#### **Art 7.3 Studeren met een functiebeperking**

1. Een schriftelijk verzoek om aanpassing van het onderwijs of de tentamens of om speciale faciliteiten op grond van een blijvende of tijdelijke functiebeperking dient door de desbetreffende studenten zo mogelijk twaalf weken doch uiterlijk vijf weken voordat studenten zullen deelnemen aan het onderwijs of de tentamens te worden ingediend bij ESA.

The academic advisor will advise students, either on request or on the advisor's own initiative, on all the aspects of the degree program, and will ensure, partly based on the students' study progress and whenever necessary, adequate referral to the qualified bodies of TU/e, to ESA student advisors and/or student counsellors or TU/e confidential counselors.

#### **Monitoring study progress**

The Department Board will ensure that the examination results of the individual students are registered and made known in good time in OSIRIS.

Where appropriate, the Department Board will organize a discussion of the results between the students and their academic advisor of the degree program the students are taking.

The academic advisor will inform students who fall far behind in their studies of the opportunities to receive extra support or ways to limit the delay as much as possible.

#### **Studying with a functional impairment**

Students wishing to request an adjustment to the way of teaching or examinations, or for special facilities because of a permanent or temporary functional impairment, should submit such a request to ESA in writing before they are scheduled to take part in the program or the exams. The request should be submitted twelve weeks in advance if possible, but in any event no later than five weeks in advance.

2. Het verzoek gaat vergezeld van de bescheiden die redelijkerwijs nodig zijn voor de beoordeling van het verzoek. Daaronder wordt in ieder geval begrepen een recente verklaring van een arts of een psycholoog of een orthopedagoog van een BIG- (Beroepen in de Individuele Gezondheidszorg), NIP-(Nederlands Instituut van Psychologen), of NVO-(Nederlands Vereniging van Pedagogen en Onderwijskundigen) geregistreerd testbureau. Zo mogelijk geeft deze verklaring een schatting van de mate en de duur van de functiebeperking.

The request should be accompanied by any documents reasonably required to assess the request. These should include at least a recent statement from a physician or psychologist or from a remedial educationalist registered with BIG (Individual Health Care Professions), NIP (Dutch professional association of psychologists) or NVO (Association of Educationalists in the Netherlands). If possible, the statement should provide an estimation of the extent and likely duration of the functional impairment.
3. ESA stuurt verzoeken van studenten samen met het advies van de studentendecaan aan het faculteitsbestuur voor zover het verzoek betrekking heeft op faciliteiten. In geval het verzoek betrekking heeft op het verlenen van aanpassingen ten behoeve van het afleggen van tentamens stuurt ESA verzoeken van studenten en het bijbehorende advies aan de examencommissie.

ESA will send students' requests accompanied by the recommendations of the student counselor to the Department Board in so far as the request relates to facilities. In the event that the request relates to granting adaptations to enable the students to take an examination, ESA will send the students' request and the related recommendations to the Examination Committee.
4. Het besluit omtrent aanpassingen dan wel het verlenen van faciliteiten wordt binnen twintig werkdagen na ontvangst van het verzoek genomen door het faculteitsbestuur respectievelijk de examencommissie. Het faculteitsbestuur draagt daarbij zorg voor de kwaliteit en het niveau van het onderwijs en de tentamens.

The decision regarding adaptations or the granting of facilities shall be taken by the Department Board or the Examination Committee, respectively, no later than twenty working days after the request has been received. The Department Board shall care for the quality and level of the teaching and examinations.
5. De eventuele aanpassing is zoveel mogelijk afgestemd op de individuele functiebeperking. De te verlenen faciliteiten kunnen bestaan uit een op de individuele situatie afgestemde vorm of duur van het onderwijs en/of de tentamens, of het ter beschikking stellen van praktische hulpmiddelen.

Any adaptations shall be attuned as much as possible to the individual's functional impairment. Facilities provided may consist of adjustments to the individual situation of the form or duration of the teaching and/or examinations, or of the provision of practical aids.

## **H 8 OVERGANGSREGELINGEN EN SLOTBEPALINGEN**

## **TRANSITIONAL ARRANGEMENTS AND FINAL PROVISIONS**

**Art 8.1 Overgangsregeling**

1. Indien deze regeling wordt gewijzigd, daaronder begrepen een wijziging van de bijlage, wordt door het faculteitsbestuur zo nodig een overgangsregeling vastgesteld. De overgangsregeling wordt opgenomen in de bij deze regeling behorende bijlage.
2. In de overgangsregeling wordt in ieder geval opgenomen:
  - een regeling omtrent vrijstellingen die verkregen kunnen worden op grond van reeds behaalde tentamens, en
  - de geldigheidsduur van de overgangsregeling.

**Art 8.2 Wijziging**

1. Een wijziging van deze regeling is niet van toepassing op het lopende studiejaar, indien de belangen van de studenten hierdoor redelijkerwijze worden geschaad.
2. Een wijziging van deze regeling kan niet met terugwerkende kracht een reeds ten aanzien van een student genomen besluit beïnvloeden.

**Transitional arrangements**

If these regulations, including the Annex, are amended, the Department Board shall, if necessary, make a transitional arrangement. The transitional arrangement shall be incorporated in the Appendix to these Regulations.

The transitional arrangement shall always include:  
regulations regarding exemptions that may be obtained based on examinations already passed, and  
the term of validity of the transitional arrangement.

**Amendments**

Amendments made to these regulations shall not apply in the current academic year if they unduly harm the interests of students.

An amendment of these regulations may not backdate any decision already taken in regard to students.

**APPENDICES**

**to Article 3.2, paragraph 1 of the Program and Examination Regulations for the Master's Degree Program in Mechanical Engineering**

**a. Content of the degree program and related final examination**

The degree program comprises the following examination components with corresponding credits:

**Mechanical Engineering**

Examination component	Credits
Compulsory study components	20
Specialized elective study components	20
Free elective study components	15
Internship	15
Graduation project	45
Professional skills	5

**Special master track Manufacturing Systems Engineering**

Examination component	Credits
Compulsory study components	30
Specialized elective study components	15
Free elective study components	15
Internship	15
Graduation project	45

**Special master track Artificial intelligence Engineering Systems**

Examination component	Credits
Compulsory study components	30
Specialized elective study components	10
Free elective study components	10
Internship	15
Graduation project	45

Professional skills	10
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**b. Content of the tracks**

The degree program(s) contains the following tracks with the corresponding study components, course code and credits:

**b1. Mechanical Engineering**

**compulsory study components**

**Select 20 credits from list**

Study component	Code	Credits
Microfabrication methods	4UM00	5
Control Engineering	4CM00	5
Interfacial Transport Phenomena in engineering flows	4BM60	5
Advanced Engineering Mathematics	4BM00	5
Advanced Computational Continuum Mechanics	4MM10	5
Multibody and Non-linear Dynamics	4DM10	5
Experimentation for Mechanical Engineering	4BM20	5
Sustainable Energy Sources	4EM70	5
Engineering Optimization	4DM20	5
Scientific Computing for Mechanical Engineering	4EM30	5
Applications of Design Principles	4CM50	5
Fracture Mechanics	4MM50	5

**specialized elective study components**

**Select 20 credits from list**

Study component	Code	Section	Credits
Structural Dynamics and Vibro-Acoustics	4DM00	DC	5
Composite and Light-weight Materials	4MM00	MoM	5
System Theory for Control	4CM10	CST	5
Introduction to Computational Fluid Dynamics	4RM00	PF	5
Structural performance of polymers and polymer composites	4LM60	PT	5
Gasdynamics	4EM10	ET	5
Polymer Processing	4LM20	PT	5
Heat and Flow in Microsystems	4EM40	ET/MS	5
Modelling Combustion	4BM30	PF	5
Computational and Experimental Micro-mechanics	4MM20	MoM	5
Integrated Systems Design	4CM70	CST	5
Advanced Motion Control	4CM60	CST	5
Optimal Control and reinforcement learning	4SC000	CST	5
Non-linear Control	4DM30	DC	5
Microfluidics put-to-work	4UM10	MS	5
Multiscale Modelling for Polymer Mechanics	4LM30	PT	5
Supervisory Control	4CM30	CST	5
Physical and data-driven modelling	4CM40	CST	5
Extremum Seeking Control	4CM80	CST	2.5
Thermal Energy Storage	4EM50	ET	2.5
Hydraulic Turbomachines	4BM10	PF	5
Control of Distributed Parameter Systems	4DM60	DC	2.5



Analysis and design of networked dynamical systems	4Dm70	DC	5
Modelling and Control of Manufacturing Systems	4DM40	DC	5
Optical Diagnostics for Combustion and Fluid Flow	4BM40	PF	5
Advanced Discretization Techniques	4EM60	ET	5
Hybrid Systems and Control	4CM20	CST	5
Introduction to Petroleum Production	4BM50	PF	2.5
Rheology	4LM50	PT/MS	5

Note: additional core courses above the mandatory 20 credits may be part of the specialization.

#### free elective study components

**15 credits**

The list of study components that can be part of the elective program is too extensive to be listed here. In the online education guide <http://educationguide.tue.nl> a list of recommended courses offered by other TU/e departments can be found.

#### Internship

**15 credits**

It is allowed to use 5 credits from the individual space to extend the internship. The student needs to apply for this extension before the start of the project on the "Internship contract".

The internship needs to be finished within the period, which is recorded on the internship contract, according to the rules in the table below.

Credits	Internship period	Expiration after
15	11 weeks	15 weeks
15+5	14 weeks	18 weeks

Should the student fail to finish the project in time, the student must contact the academic advisor. In consultation with the mentor, a short (maximum 2 week) extension period may be allowed.

In case this extension is insufficient the students need to get approval from the examination committee for a possible further extension.

For students with a Bachelor's degree at Higher Vocational Education (HBO) level, an academic research internship is mandatory, to be carried out at the TU/e or another university in the Netherlands or abroad. This regulation applies to students who followed the pre-master program in 2016-2017 or later. Students who have already passed a "pre-master end project" (SEP) are exempted from the previous regulation.

### **graduation project**

**45 credits**

The graduation project is the culmination of the master program. This project is supervised by a thesis supervisor who is a (assistant/associate/full) professor from your allocated research section. The thesis supervisor does not also have to be your research section mentor.

The graduation project consists of two phases (details of content and examination can be found on TU/e's education information system):

- the preparation phase
- the project phase

The preparation phase of the project takes typically 2-6 full working weeks. During the preparation, the student formulates a project goal (based on literature and/or previous work), writes a project plan and a project planning (deliverables and timeline). The preparation phase is concluded with a small report containing:

- The background and already obtained results in the topic (at least 2 pages)
- The project goal
- Research plan (means, steps, results)
- Project planning (of at least 6 and at most 8 months)
- End date

This report is to be graded with "VO"/"ON" by the thesis supervisor. The preparation report has to be uploaded in the Sharepoint archive. The

At delivery of the “ON/VO” grade as indicated on the registration form for the project phase, the OWB checks whether the report has been uploaded and whether the student has fulfilled all project entry requirements (has enough EC and filled in all necessary forms). Only then, the grade for the preparation phase is accepted and the student may start the project phase. Note that, from this allowed start, the project may not be finished within 6 months.

At the start of the project phase, so at delivery of the preparation report and the preparation grade, the student must have successfully passed at least 70EC of his/her formally approved curriculum

A crucial element of the preparation report is the projected end-date of the project phase. This end date must be within the period of 6 to 8 months after the end of the preparation phase and marked by the submission of the registration form for the project phase.

The start- and end-date of the project phase are marked on this registration form.

The end of the project phase includes the presentation, defense and grading by the graduation committee. The graduation committees are chaired by assistant professors (from UD1), associate professors or full professors

If the project phase result is not delivered in time, the student contacts the study advisor. Based on the student’s situation and in consultation with the thesis supervisor a short (maximum 4 week) period of extension may be fixed. The study advisor has the mandate to execute this procedure. Should the student fail to finish the project within this extended period, a request for continuation of the project including a binding and substantiated proposal regarding the time limit and supported by the thesis supervisor needs to be approved by the examination committee. The end result of the graduation project is then limited to a “7”- grade. If the student does not deliver the project result within the new time frame approved by the examination committee, the student receives a “Failed” grade (issued by the Graduate Program Director). After this, a proposal to start a new project (filed by the student and in consultation with the Graduate Program Director) needs to be approved by the examinations committee. The examinations committee may deviate based on specific circumstances.

Students receiving a “Failed” grade (Lower than a 6.0) by the graduation committee can file a motivated request for a retake of the graduation project, to be judged by the examination committee. This retake can either be a new project or an extension of the ‘failed’ project. The request must be formulated in consultation with the Graduate Program Director and it must be approved by the intended thesis supervisor. The Examination Committee can deviate from these rules based on specific circumstances.

**Professional skills**

**5 credits**

There are two *mandatory* courses on professional skills:

- Coaching & Tutoring (4WM00)
- Career Development (4WM10)

For students without experience in Design Based Learning (OGO), a compulsory alternative is offered for 4WM00:

- Group work and academic writing (4WM50)

These courses are offered several times during the academic year. The number of available places, in each quartile and slot in which these courses are offered, is limited. Details of content, scheduling and examination can be found on TU/e's education information system.

**b2.**

**Special master track Manufacturing Systems Engineering**

**compulsory study components**

**30 credits**

Study component	Code	Credits
Integrated System Design	4CM70	5
Manufacturing Technology	1CM160	5

and

One course from 4 of the following 5 pillars, 20 ECTS, where selecting a course from the pillar Machine design and control is obligatory:

Machine design and control:

- Control Engineering 4CM00
- Micro Fabrication 4UM00

Factory design and control:

- Modelling and Control of Manufacturing Networks 4DM40
- Modelling and analysis of manufacturing systems 1CM10

Maintenance design and control:

- Advanced Maintenance and Service Logistics 1CM120
- Fracture Mechanics – Theory and Application 4MM50

Supply network design and control:

- Multi-Echelon Inventory Management 1CM100
- Design of Operations Planning and Control Systems 1CM140

AI design and control

- Data analytics for business intelligence 1BM110
- Computational Intelligence 1BM120

**Specialization elective study components      select 15 credits from list from assigned section**

Course	Code	Section	Credits
System theory for control	4CM10	CST	5
Control engineering	4CM00	CST/DC/MS/PT	5
Structural Dynamics and vibro-acoustics	4DM00	DC	5
Microfabrication methods	4UM00	MS/PT	5
Advanced Engineering Mathematics	4BM00	MS/PT	5
Experimentation for Mechanical Engineering	4BM20	MS/PT	5
Advanced motion control	4CM60	CST	5
Multibody and Non-linear Dynamics	4DM10	DC	5

Heat and Flow in microsystems	4EM40	MS/PT	5
Polymer processing	4LM20	MS/PT	5
Supervisory control	4CM30	CST	5
Engineering optimization	4DM20	CST	5
Application of design principles	4CM50	CST/DC	5
Non-linear control	4DM30	DC	5
Control of distributed parameter systems	4DM60	DC	2,5
Microfluidics-put-to-work	4UM10	MS/PT	5
Hybrid systems and control	4CM20	CST	5
Modelling and control of manufacturing systems	4DM40	DC/MS/PT	5
: Analysis and design of networked dynamical systems	4DM70	DC	5
Fracture mechanics	4MM50	MS/PT	5
Optimal control and reinforcement learning	4SC000	CST/DC	5

**Note:** The minimum number of ECTS devoted to ME courses in the first year is 25 ECTS (10 ECTS in the core and 15 ECTS in the specialization electives).

#### free elective study components

**15 credits**

The total list of study components that can be part of the elective program is too extensive to be listed here. In the online education guide <http://educationguide.tue.nl> a list of recommended courses offered by other TU/e departments can be found. However, MSE-W specific recommended courses from the IE&IS department are listed below.

- Business process management 1BM05
- Design and analysis of experiments 2DMN00
- Configuration management 1CM180

- Advanced simulation 2DI66
- Warehouse operations management 1CM200
- Data analytics for business intelligence 1BM110
- Computational intelligence 1BM120

Recommended homologation MSE-W:

- Stochastic Performance Modelling 2WB60

**Internship**

**15 credits**

See Appendix 1 b1

**graduation project**

**45 credits**

See Appendix 1 b1

**Artificial intelligence engineering systems**

**b3.**

**compulsory study components**

**30 credits**

Mathematics 5 credits, Select one course from:		
Course	Code	Credits
Statistical signal processing	5CTA0	5
Non-linear optimization	2DME20	5
Discrete mathematics	2DME10	5

Learning AI 10 credits		
Course	Code	Credits
Bayesian machine learning and information processing	5SSD0	5
Artificial neural networks and deep learning	5LSLO	5

Fundamentals for Engineering systems 10 credits, Select two courses from the Engineering Systems Core Topics:		
Course	Code	Credits
<b>Model based control</b>		
Control Engineering	4CM00 or	5
System Theory for Control	4CM10 or	5
Control principles for engineered systems	5SMC0	5
<b>Optimization</b>		
Engineering Optimization	4DM20 or	5
Nonlinear Optimization	2DME20	5
<b>Machine Learning for modelling and Design</b>		
Machine Learning for modelling and design	4AI000	5
<b>Dynamical Systems</b>		
Multi-body and Nonlinear Dynamics	4DM10 or	5
Modelling Dynamics	5CSA0	5
<b>Computer architectures for AI</b>		
Intelligent architectures	5LIL0	5

Human interaction & ethics 5 credits		
Philosophy and ethics of AI	0LM190	5

Professional skills 10 credits		
Course	Code	Credits
Software engineering for artificial intelligence	5ARA0	5

**Professional skills**

**10 credits**

There are two *mandatory* courses on professional skills:



- Coaching & Tutoring (4WM00) 2,5 credits
- Career Development (4WM10) 2,5 credits

For students without experience in Design Based Learning (OGO), a compulsory alternative is offered for 4WM00:

- Group work and academic writing (4WM50) 2,5 credits

These courses are offered several times during the academic year. The number of available places, in each quartile and slot in which these courses are offered, is limited. Details of content, scheduling and examination can be found on TU/e's education information system.

Students also follow a course on Programming for artificial engineering systems 5 credits.

- Software engineering for artificial intelligence (5ARA0) 5 credits

**Specialization elective study components**

**10 credits from list**

Code	Course	Credits
<b>Thread Mechanical Engineering</b>		
4BM00	Advanced Engineering Mathematics	5
4BM60	Interfacial Transport Phenomena in Engineering Flows	5
4DM00	Structural Dynamics and Vibro-acoustics	5
4RM00	Introduction CFD	5
4BM20	Experimentation for Mechanical Engineering	5
4MM10	Advanced computational continuum mechanics	5
4EM30	Scientific computing for Mechanical Engineering	5
4EM60	Advanced Discretization techniques	5

Onderwijs- en Examenregeling MSc Mechanical Engineering volgens de Graduate School 2021-2022 / Program and Examination Regulations MSc Mechanical Engineering 2021-2022 according to the Graduate School

4UM00	Microfabrication Methods	5
<b>Thread Robotics</b>		
0LAUK0*	Robots Everywhere	5
5XSK0*	Data fusion & Semantic interpretation	5
0HM280	Human-Robot interaction	5
4DC00*	Dynamics and Control of Robots	5
4SC020	Mobile robot control	5
5AUA0	Advanced Sensing using Deep Learning	5
<b>Thread Automotive Systems</b>		
4AT000	Vehicle Dynamics	5
5XSJ0*	Automotive Sensing	5
5LSM0	Convolutional neural networks for Computer Vision	5
5XSK0*	Data fusion & Semantic interpretation	5
4AT030	Advanced Full-Electric and Hybrid Powertrain Design	5
4AT050	Vehicle Control	2,5
4AT070	Advanced control for future HD powertrains	5
5AUA0	Advanced Sensing using Deep Learning	5
<b>Thread Health</b>		
5CTA0	Statistical Signal Processing	5
5LSG0	Neuromonitoring	5
4UM10	Micro fluidics put to work	5
5LSC0	Biomedical sensing technology	5
5SSC0	Adaptive array signal processing	5
5LSJ0	Image analysis for health-care technologies	5
4UM00	Microfabrication Methods	5
<b>Thread High-tech Systems &amp; Mechatronics</b>		
4DM00	Structural Dynamics and Vibro-acoustics	5
4CM60	Advanced Motion Control	5

4DM10	Multi-body and Nonlinear Dynamics	5
4SC050	Performance of Nonlinear Control Systems	2,5
5LMD0	Selected topics in Systems and Control	2,5
<b>Thread Learning in Systems and Control</b>		
5CTA0	Statistical Signal Processing	5
4SC000	Optimal Control and reinforcement learning	5
4CM30	Supervisory Control	5
4MM80	Extremum Seeking control	2,5
4DM70	Dynamics and control of Cooperation	5
5SMB0	Identification	5
4SC070	Learning Control	5
5SC28	Machine Learning for Systems and Control	5

**free elective study components**

**10 credits**

The list of study components that can be part of the elective program is too extensive to be listed here. In the online education guide <http://educationguide.tue.nl> a list of recommended courses offered by other TU/e departments can be found.

**Internship**

**15 credits**

See Appendix 1 b1

**graduation project**

**45 credits**

See Appendix 1 b1

- c. Organization of practical exercises**  
For study components including practical exercises, see the OSIRIS catalogue
- d. Study load of the degree program and of each of the study components it comprises**  
The minimum study load of the program is 120 credits. The study load of the study component is indicated under a or b, respectively.
- e. Number and frequency of the examinations and practical exercises**  
The examinations of the study components are described in the OSIRIS catalogue.
- f. Form of the degree program**  
The program is a full-time program.
- g. Format of examinations**  
The format of examinations of the study components listed under a or b is published in the OSIRIS catalogue
- h. Conditions for admission to the examinations**  
All examinations/practical exercises may be taken and completed in any order desired, apart from the graduation project, which marks the conclusion of the program.
- i. Participation in practical exercises**  
For information on which examination of study components may not be taken until the corresponding practical exercises have been successfully completed, see the OSIRIS catalogue

**j. The study components from which students must choose for the elective part of their degree programs**

For the elective part of their degree programs, students must make a choice from the following study components:

1. TU/e Master's study components,
2. master's study components offered by a Dutch university other than the TU/e,
3. master's study components offered by an institution of Higher education abroad,
4. An International research or design work placement at a partner university abroad.
5. A maximum of 15 credits of Bachelor's study components of sufficient level to be determined by the Examination Committee. With respect to contents, the study components that together form the elective programs may not show considerable overlap, either with each other or with all other study components of the study program.

**k. The number of opportunities to join the program**

Internal intake: Students who have completed a Bachelor's degree at TU/e may join the Master's program on the first day of the month following successful completion of the Bachelor's degree audit. The same applies to students who have completed a pre-Master's program that provides admission to the Master's program. Students of competency-centered Master's learning programs may only join on September 1 or February 1 (see Regulations for 'Registration, Study Choice Check, Enrollment and Termination of Enrollment').

Other intake: As of September 1, 2012, students may join the Master's program on at least two dates: September 1 and February 1, in which a two-year program is offered that is manageable. External transfer students and re-enrollers, namely those who have not completed a Bachelor's degree at TU/e or who have not been enrolled at this university for a continuous period, may enroll in the Master's program on September 1 and February 1 of each academic year, provided they meet the requirements (see Regulations for 'Registration, Study Choice Check, Enrollment and Termination of Enrollment').

**l. Qualitative admission requirements for issuing proof of admission**

Generic (supra-departmental) qualitative admission requirements:

Proficiency in English

Students who do not meet the diploma requirement of English at pre-university level (vwo) are obliged to submit one of the following language tests:

- TOEFL (Test of English as a Foreign Language): total score of at least 90 points, and a minimum score of 21 for each section. The TU/e only accepts the TOEFL Internet-based test. Note: the TU/e only accepts scores released on one test date. The TU/e does not accept MyBest Scores, or
- IELTS (International English Language Testing System), Academic version: with an overall band score of at least 6.5 and a minimum of 6.0 for each section, or
- University of Cambridge: proof of C2 Proficiency (previously Certificate of Proficiency in English CPE) with an overall score of 180 and minimum of 169 per section or a proof of C1 Advanced (previously Certificate in Advanced English CAE) with an overall score of 176 and a minimum of 169 per section.

Exemptions to the obligation to submit a language test are as follows:

- Students who have completed their entire Bachelor's program in English or completed the final three years of pre-university education in the following countries: Australia, Canada, Ireland, New Zealand, UK and USA.
- Students who have obtained a diploma at the Dutch vwo level.
- Students with a diploma of General Secondary Education (ASO) from a secondary school issued under the responsibility of the Flemish Ministry of Education and Training.
- If you have one of the following nationalities: Australia, Canada, Ireland, New Zealand, United Kingdom and USA.

Degree program specific qualitative admission requirements:

The admission requirements for Mechanical Engineering are defined in such a way that the students fit to and are able to successfully complete the Master Program Mechanical Engineering. In order to comply, the student needs to have sufficient academic knowledge and skills in the area of mechanical engineering; this is to ensure that the student has got a solid basis for the more advanced studies in the master program. It is expected that the student has experience in (i) mathematics fundamentals, calculus, (ii) dynamics, signals, systems, and control, (iii) thermodynamics, transport phenomena, (iv) fluid and solid mechanics, mechanical properties of materials, and (v) construction and design. These topics are typically covered by Bachelor programs in the field of Mechanical Engineering. Since the program is taught in English, the level of English when entering the program needs to be sufficient.

<b>Type</b>	<b>Criterion</b>	<b>Norm</b>	<b>Method</b>	<b>Assessed by</b>	<b>Score</b>
<i>Academic Knowledge, skills &amp; competencies</i>	Academic competences at the level of a BSc degree at a research university	Knowledge and skills acquired from a BSc level research university degree, equal to a Dutch university BSc degree level.	Bachelor's degree* end level equivalent to the Dutch higher education Bachelor level is checked. <ul style="list-style-type: none"> <li>- For international BSc programs the level of University is checked (using NUFFIC and/or UK-Naric) in which also the GPA level is checked depending on country and institution to compare to the level of education (see regeling mastertoelating).</li> <li>- Students with a Dutch University BSc degree or University of Applied Science can get a first indication from <a href="http://doorstroommatrix.nl">doorstroommatrix.nl</a> and <a href="http://www.studiekeuze123.nl">www.studiekeuze123.nl</a>, but note that these sites are not from our university and thus</li> </ul>	Central Admissions Board	Sufficient/insufficient

			can only be used for an indication.		
<i>Subject-Related Knowledge &amp; Skills</i>	BSc degree in Mechanical Engineering or equivalent.	<p>Specific knowledge and understanding in science disciplines, obtained within a mechanical engineering context or related. More specifically, the expertise of the candidate will be assessed in the following topics:</p> <ul style="list-style-type: none"> <li>- Mathematics Fundamentals, Calculus (including differentiation, integration, differential equations, vector calculus)</li> <li>- Dynamics, Signals, Systems, and Control (including signal processing, modeling, identification, control design and system integration)</li> <li>- Thermodynamics, Transport Phenomena (including first, second law, gas law, entropy, thermal cycles, convection, conduction, radiation, diffusion)</li> <li>- Fluid and Solid Mechanics, Mechanical Properties (including Navier-Stokes equation, Bernoulli's law, conservation laws, kinematics, equilibrium conditions, strain, stress, elasticity, FEM, boundary conditions)</li> <li>- Construction and Design (including design principles and solutions, dynamic and thermo-mechanical behavior, compensation mechanisms).</li> </ul>	Based on: Assessment of transcript of records displaying the content of previous course subjects and project work.	Departmental admissions board	Sufficient/insufficient/conditional; under the condition that (1) the student completes a premaster (max 30 Credits) or (2) the student gets the defined requirement of homologation during the master (max 15 Credits). *The conditional situation always depends on educational feasibility.



<i>Language skills</i>	Sufficient command of the English language	Students must meet the English proficiency requirements as stated in Appendix 1 under I (see generic (supra-departmental) qualitative admission requirements).	An assessment will be made as to whether the command of the English language is sufficient to ensure the student can follow the courses taught in English.	Central Admissions Board	Sufficient/insufficient
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Note that all items need to be sufficient. We do not score good or excellent, since we assess the admissibility of the student and we do not use a selection of our students for the master.

\*Statement by the examination committee of the institution in question declaring that the student has fulfilled the conditions for obtaining the degree is also satisfying.

# Credits according to European credit transfer system (1 ECTS is 28 hours of student work/study)

^Motivation and aptitude are not used in admission assessments by the committees. The student needs to be aware of e.g. the program, the tracks, and the education system at the TU/e. The board of admission (after admission or rejection) can include a recommendation on the study direction or alternative studies (based for example on the motivation letter provided on application).

**m. Bachelor's degree certificates that provide direct access to the Master's program**

The following Bachelor's degree certificates from the TU/e provide direct access to the Master's program:

Aerospace Engineering (TUD)
Applied Physics (TU/e, TUD, UT)
Mechanical Engineering (TUD, TU/e, UT)
Marine Technology (TUD)

**n. Transitional arrangements**

- A student is exempt (EXM) from the diagnostic test for professional skills with retroactive effect (which was mandatory prior to the academic year 2020-2021) in as far as this test was not completed by the student on or after September 1, 2020.
- The degree program specific qualitative admission requirements, as stipulated in Appendix 1, under I, apply to students who wish to start a Master's degree program on or after September 1, 2020.

.....  
**o. The way in which education in the degree program is evaluated and the results are made available to the relevant official bodies**

The degree program shall describe the process of quality care within the program, how it deals with the results of the course and interdisciplinary evaluations, and what the role is of the various official bodies within this process, which must at least include recurrent course evaluations and interdisciplinary evaluations within the formats agreed at TU/e.

**p. One opportunity practical exercises**

Only one opportunity is offered each academic year to take the practical exercise(s) listed below:  
Not applicable

**Appendix 2 to Article 3.2, paragraph 2 of the Program and Examination Regulations for the Master's Degree Program in Mechanical Engineering**

**Rules concerning the pre-Master's program**

**PRE-MASTER'S PROGRAMS**

**Art 1 Enrollment and admission**

1. The admission and registration for a pre-Master's program relating to a Master's program chosen by students are open to those in possession of Higher Vocational Education (hbo) degree certificate or a university Bachelor's degree certificate from a university as well as a maximum of a 30-credit deficiency to be able to follow the Master's program. If the certificate has not yet been actually awarded, the prospective students may still enroll in the pre-Master's program on condition that in due time before the start of the pre-Master's program the students are in the possession of a statement by the Examination Committee of the institution in question declaring that they have fulfilled the conditions for obtaining the university or hbo degree.
2. Students who have a hbo diploma (with exception of students with a vwo prior education with a N+G or N+T profile) must meet the English proficiency requirements as stated in Appendix 1 under I as a supplement to the requirements in Art 1 to be admitted and enrolled in a Pre-Master's program.  
To be admitted and enrolled in the pre-Master's program students who have an hbo diploma must provide proof that they have the required minimum level of mathematics, pre-university (VWO) mathematics B or T.
3. Students will be admitted to their chosen Master's programs only after they have successfully completed the study components of the pre-Master's program.
4. The registration period as included in the applicable Regulations for Registration, Academic Career Check, Enrollment, and Termination of Enrollment shall apply for re-registration in the pre-Master's program.

**Art 2 Conditions for the pre-Master's program**

1. A pre-Master's program is a maximum of 30 credits. The study components belonging to a pre-Master's program must be scheduled within maximally two semesters from the moment of enrollment.

2. For students who have a Higher Vocational Education (hbo) degree certificate of a degree program
  - listed in Appendix 3, the pre-Master's program encompasses a maximum of 30 credits
  - not listed in Appendix 3, the Departmental Admissions Committee shall determine if the deficiency is 30 credits.

If this is the case, the Departmental Admissions Committee shall decide whether admission to and enrollment in the regular pre-Master's program is permitted.

3. If the deficiency of students with a university degree certificate is maximally 30 credits, the Departmental Admissions Committee determines the size and content of the applicable pre-Master's program no later than August 15. If there is a second registration period for the pre-Master's program as of February 1, the pre-Master's program must be determined before January 15.
4. There shall be at least two opportunities per study component in a period of two semesters to take final tests
5. If students with prior education at university have a deficiency of a maximum of 15 credits, the departmental Admissions Committee determines whether the students must follow a pre-Master's program or that the subjects can be taken within the Master's program.
6. If students cannot complete the pre-Master's program within six months of the start of the program and therefore are placed at a demonstrable disadvantage, and have obtained a minimum of 15 credits at that time, the students may submit a request to expand the program with a maximum of 15 credits worth of Master's study components. The credits obtained for Master's study components during the pre-Master's program may, at the request of the students, be recorded, retaining the grade and date of examination, on the students' Master's transcript.

### **Art 3 Curriculum for pre-Master's students**

1. A program of examinations is a set of study components that constitute students' degree program (in this case, the pre-Master's program)
2. Before the start of the pre-Master's program, the departmental CSA shall give all pre-Master's students a program of examinations.
3. The composition of the pre-Master's program for students of an adjoining Higher Vocational Education (hbo) program is included in Appendix 3.
4. Individual pre-Master's programs may be composed for pre-Master's students with a university background.

### **Art 4 Study progress requirement for pre-Master's students**

1. All pre-Master's students must complete the pre-Master's program within the term set for the program (maximally two semesters). If students do not meet this requirement, they shall not be admitted to the same or another pre-Master's program that belongs to the same Bachelor's program for a period of three years. In special cases the Examination Committee may deviate from this.
2. The study progress requirement does not apply to students who have submitted a request to the ESA to withdraw before December 1 (if it is a pre-Master's program that can be completed in one semester) or before March 1 (if it is a pre-Master's program that can be completed in two semesters) and who have not re-registered for another pre-Master's program at TU/e.

Furthermore the academic progress requirement does not apply to students who have submitted a request to the ESA to withdraw who started February 1 and before May 1 (if it is a pre-Master's program that can be completed in one semester) and did not re-register for another pre-Master's program at TU/e or do not re-register as of September 1 (if it is a pre-Master's program that can be completed in two semesters).

3. Pre-Master's students shall receive a written pre-recommendation from the Examination Committee on their study progress at the mid-point of the determined term. This pre-recommendation serves as a warning in the event that the student is making insufficient study progress.
4. Within the determined term (maximally two semesters), students shall receive a binding written study progress decision from the Examination Committee relating to their continuation of the pre-Master's program. The study progress decision is:
  - a) positive if the pre-Master's students have passed the complete pre-Master's program within the determined term, and it is
  - b) negative if the pre-Master's students have failed to meet the provisions stated under a). Any credits obtained from Master's study components do not count in this regard. The pre-Master's students shall not be allowed to continue the pre-Master's program.
5. In the event of extenuating personal circumstances, as referred to in Article 5, the Examination Committee determines when the standard must be satisfied.
6. Students who still have to successfully complete one study component can make a single request for one additional opportunity to complete the study component from the Examination Committee during enrolment as pre-Master's students, preferably directly after not receiving a pass during the resit.
7. If students have not met the academic progress requirement, their enrollment is terminated at the beginning of the next month.

#### **Art 5 Personal circumstances**

1. When a study progress decision is issued, any acknowledged extenuating personal circumstances are taken into account.

2. Extenuating personal circumstances include the following:
  - a. illness, physical, sensory or other forms of functional impairment, or pregnancy;
  - b. exceptional family circumstances;
  - c. membership or presidency of the University Council, the Department Council, a program board or committee, or membership of the board of a foundation whose statutes allow for the operation of facilities or services intended for students, or a body that, in the opinion of the Executive Board, has equivalent status considering its tasks;
  - d. membership of the board of a student organization of a reasonable size and with full legal status, or of a comparable organization of reasonable size, where priority is given to promoting the general common interest and activities are genuinely performed to that end;
  - e. other personal circumstances than those described in a to d that would lead to unreasonable hardship if they were not taken into account.
3. The extenuating personal circumstances referred to in the previous paragraph will only be taken into account if they are reported to the academic advisor as soon as possible and no later than twenty working days after they arise, by or on behalf of the students. In the case of pregnancy, the students must give notification as soon as possible, once she knows she is pregnant, but preferably no later than three months before the due date.
4. Students who wish extenuating personal circumstances to be taken into account must submit documentary proof that these circumstances exist or existed. The documentary proof must be submitted to the Central Committee on Extenuating Personal Circumstances through CPO@tue.nl.
5. The academic advisor shall report extenuating personal circumstances in writing as soon as possible to the relevant Examination Committee, if students have given permission for this.
6. The Examination Committee shall ask the Central Committee on Extenuating Personal Circumstances for advice on the extenuating personal circumstances submitted by students.
7. In its letter of intent to issue a negative study progress decision, the Examination Committee must specify, giving reasons, whether extenuating personal circumstances can be recognized and what consequences this has for the students concerned.

**Art 6 Application of the Program and Examination Regulations for the Bachelor's program within the Bachelor College**

1. These Program and Examination Regulations apply to Master's study components (with exception to pre-Master's study components) that are included in the program of examinations of pre-Master's students.
2. The pre-Master's program contains study components belonging to a Bachelor's program within the Bachelor College, as well as pre-Master's study components belonging to the Graduate school. The following articles from the Program and Examination Regulations of the Bachelor's Program shall apply mutatis mutandis for these study components:
  - Article 3.8 registration for and withdrawal from study components
  - Article 3.9 registration for study components after the appointed time limit for registration
  - Article 5.1(with the exception of paragraph 3) frequency, form and sequence of mid-term tests and final tests
  - Article 5.3 oral final tests
  - Article 5.4 participation in and registration for examinations
  - Article 5.5 resits
  - Article 5.6 withdrawal
  - Article 5.7 assessment if examinations
  - Article 5.8 determining results/marking periods
  - Article 5.9 right of inspection for written (final) tests
  - Article 5.10 evaluation
  - Article 5.11 term of validity and retention periods
  - Article 7.1 student counseling (general)
  - Article 7.2 academic advisor/monitoring study progress/study planning
  - Article 7.8 studying with a functional impairment

**Appendix 3** to Article 3.2, paragraph 3 of the Program and Examination Regulations for the Master's Degree Program in Mechanical Engineering

**Contents of pre-Master's program**

Contents of pre-Master's program

The pre-Master's program consists of 30 credits of courses and training. Students with one of the HBO diplomas listed below will be admitted to the Mechanical Engineering Master's program once the pre-Master's program of 30 ECTS has been completed.

- Mandatory: 25 credits
- Elective course: 5 credits, to choose from 5 optional courses

Course	code	Mandatory/ Choice	Credits
Linear Algebra	2DL60	M	2.5
Calculus	2WBB0	M	5
Advanced Calculus	2DL40	M	2.5
Thermodynamics	4EB00	M	5
Dynamics and control of mech. Syst.	4DB00	M	5
Solid mechanics	4MB00	M	5
Mechatronic design	4CC10	C	5
Heat and flow	4PB00	C	5
Strength and structure	4LB00	C	5
Flow and structure	4RC00	C	5
Dynamics and control of robotic syst.	4DC00	C	5

Training courses for Pre-Master	Mandatory/ Choice
RSI	M
Health and Safety	M
Matlab	C
English diagnostic test	C



Admissible to the pre-Master program:

The following HBO-Bachelor's degree certificates provide direct access to the pre-Master's program.

Engineering Physics
Automotive
Aviation / Aeronautical Engineering
Electrical and Electronic Engineering
Mechanical Engineering
Mechatronics

**Appendix 4 Explanatory notes to the Program and Examination Regulations for the 2021-2022 Master's program relating to pre-Master's programs**

In connection with the inclusion of the rules concerning the pre-Master's program in Appendix 2 of this OER, additional information is provided below.

**Art 1 lid 1 Enrollment and admission**

In order to participate, students must at least possess a Bachelor's degree or Master's degree from a university (or a statement from the Examination Committee that they meet the requirements to obtain a Higher Vocational Education (hbo) degree certificate or university degree before September 1 but that the degree certificate has not yet been issued) and has a maximum deficiency of 30 credits. Appendix 3 states the hbo programs that allow direct access to the pre-Master's program. Pre-Master's students must register through 'Studielink' before May 1 for the pre-Master's programs that they would like to follow (for the Eindhoven School of Education this is August, 1

**Art 1 lid 2** Supplementary to the requirements stated in Art. 1, paragraph 1, hbo students must meet the English proficiency requirements as stated in Appendix 1 under I, and have a Maths B or T at vwo level for most Pre-Master's programs. These admission requirements apply for students who started the pre-Master's program on or after September 1, 2021. Pre-Master's students who enter the program in February 2021 (with the exception of the programs that are part of the Computer Science Graduate Program) do not have to meet these requirements.

**Art 2 Conditions for the pre-Master's program**

Students with a degree certificate from a hbo program, as stated in Appendix 3, who request registration for a pre-Master's program are directly admissible. Before commencement of the program, the students must pay a fee for this. If the hbo program is not listed in Appendix 3, or the students have a prior university background, the Departmental Admissions Committee shall assess what the level of deficiency is of students. For a deficiency that exceeds 30 credits, the students shall not be admitted to a pre-Master's program and shall be advised to enroll in the preparatory Bachelor's program. For a deficiency with a maximum of 30 credits, the students must register for a regular pre-Master's program. For students with previous university training who have a deficiency of 15 credits or fewer, the departmental Admissions Committee determines whether they are directly admissible to the Master's program and must remedy the deficiencies within the Master's program. See paragraph 1 of this article.

The Departmental Admissions Committee shall establish the pre-Master's programs to be followed by students, based on the registration application and prior education of university Bachelor's or Master's students, as stated in paragraph 2 of this article. The Committee will do this after having given the students the opportunity to state the reasons that they consider themselves eligible for admission to the pre-Master's program and whether they would like to apply for exemptions based on competencies, knowledge, insight, or skills acquired elsewhere. Before commencement of the pre-Master's program, the students shall pay a fee. For regulations pertaining to this, please refer to the applicable Regulations for Registration, Academic Career Check, Enrollment, and Termination of Enrollment. This also applies to the Master's study components the students are allowed to take on the basis of paragraph 5.

Paragraph 3 states that at the request of students and with approval of the Examination Committee students may expand their pre-Master's programs with a maximum of 15 credits worth of Master's study components if the students

- cannot complete the pre-Master's program within six months of its commencement due to the scheduling of study components
- and 15 credits within the pre-Master's program have been completed
- and the Examination Committee has grounds to believe the students have sufficient prior knowledge to participate in Master's study components.

Students who have been granted permission to take additional study components will receive confirmation from the Examination Committee, which will also notify the ESA and the departmental CSA. The departmental CSA will add these study components to the program of examinations, as referred to in Article 3.

### **Art 3 Program of Examinations for pre-Master's students**

Students may not take or be examined in study components that are not part of the program of examinations. The students can only register for those study components that are included in their program of examinations. They must therefore be careful to ensure that their program of examinations includes the study components that they would like to take and that they are allowed to take.

University students, as referred to in paragraph 4, are students with previous training that has been assessed by the Departmental Admissions Committee to be equivalent to three years of scientific education in the Netherlands.

### **Art 4 Study progress requirement for pre-Master's students**

Since the introduction of the Bachelor-before-Master rule, pre-Master's students may no longer be admitted to a Master's program until they have completed the pre-Master's program. For this reason, a study progress requirement for pre-Master's students has become part of the

regulations. These students must complete the pre-Master's program within the set term (maximally two semesters). Students who have been issued with a negative study progress decision may not re-register for the same TU/e program to which the pre-Master's program belongs for a period of three years.

At the mid-point of the pre-Master's program, the department may issue a provisional positive or negative recommendation, known as a pre-recommendation. If students receive a provisional negative pre-recommendation, this gives them a reasonable term in which to meet the study progress norm.

If students do not successfully complete the first year of the pre-Master's program, they shall receive a negative decision.

In the case of a postponed recommendation, the Examination Committee may establish an amended norm, in accordance with paragraph 5.

The Examination Committee may grant pre-Master's students one additional opportunity to take an exam, if the Examination Committee is of the opinion that the students will be able to complete the pre-Master's program by means of this extra opportunity to take an exam.

#### **Art 5 Extenuating personal circumstances**

Extenuating personal circumstances may play a role when issuing a study progress decision. These personal circumstances correspond to those that may play a role when issuing a binding recommendation on the continuation of studies. They are laid down in Article 2.1 of the 2008 WHW Implementation Decree. This article describes the procedure by which the students can put forward personal circumstances, if applicable. In order to assess those personal circumstances, the Examination Committee will seek the advice of the Central Committee on Personal Circumstances. Based on this advice, the Examination Committee will decide whether a postponed binding recommendation, as referred to in Article 3.4, applies.

#### **Art 6 Application of the Program and Examination Regulations for the Bachelor's program within the Bachelor College**

Students who will be following a pre-Master's program will be registered in a Bachelor's program that prepares for a Master's program. The Program and Examination Regulations for this Bachelor's program shall thus also apply to the Bachelor's study components taken by the students.

**Appendix 5 to Article 1.1, paragraph 3 of the Program and Examination Regulations for the Master's Degree Program in Mechanical Engineering**

Contents of pilot(s):

Not Applicable

The pilot(s) deviate from the following provisions of the OER:

Not Applicable

**Appendix 6 Description Master Allocation Procedure for the academic year 2021-2022**

### Introduction

In order to ensure that MSc students will get supervision of sufficient quality, the Board of the Department of Mechanical Engineering aims to match the number of MSc students within each section of the Department of Mechanical Engineering<sup>1</sup> with the available supervision capacity of that section. In order to safeguard quality of supervision, the number of students that can enroll in a particular section is limited. From September 2017 a procedure has been implemented within the Department of Mechanical Engineering to allocate students to sections. The Board of the department thereby provides students a suitable position within the university to complete their MSc project.

The Department of Mechanical Engineering is responsible for the MSc program Mechanical Engineering (MW), including the special Master's tracks Manufacturing Systems Engineering (MSE-W) and Artificial intelligence Engineering Systems (AIES-W), and the interdepartmental MSc programs Automotive Technology (AT), Systems and Control (S&C), and Sustainable Energy Technology (SET). The regulations for the procedure presented below apply to all programs. Fixing supervision capacity per section and the timeline and implementation of the procedure are slightly different for the MSc program MW (including MSE-W and AIES-W) and the interdepartmental MSc programs SET, AT and SC (because other departments are involved<sup>2</sup>).

The following topics for the Capacity-driven Master Allocation Procedure have to be taken into account:

- Regulations
- Fixing supervision capacity per section

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<sup>1</sup> The department of Mechanical Engineering consists of 7 sections also denoted as specializations.

<sup>2</sup> Other departments may use the term research group to denote a research section

- Selection Procedure
- Timeline and implementation:
  - Timeline + implementation MW (including MSE-W and AIES-W)
  - Timeline + implementation SET and AT
  - Timeline + implementation S&C

### Procedure “Capacity-driven **Master Allocation Procedure**” (MAP)

#### Regulations

- Each of the MSc programs within the Mechanical Engineering Department is subjected to the same MAP procedure. The MAP procedure for these MSc programs is carried out once a year.
- Students can only take part in one MAP procedure per year. Students are not allowed to enter the MAP procedure for more than one MSc. Program (MW/AT/SET/S&C) per calendar year.
- Each of the sections within the Mechanical Engineering department has a clearly defined supervision capacity (depending on the number of its scientific staff). This capacity determines the maximum number of MSc students that can enroll in a section through one of the MSc programs<sup>3</sup>.
- Bachelor students from a Dutch university can take part in the MAP procedure for MW if they have secured at least 120 ECs in their BSc program, measured in May of each academic year at the completion of the regular exams at the end of Q3. Students missing more than 60 ECs at this stage need to take part in the MAP procedure for MW of the next year.
- Bachelor students from a Dutch university can take part in the MAP procedure for SET/AT/S&C if they have secured at least 135 ECs in their BSc program, measured in July of each academic year at the completion of the regular exams at the end of Q4. Students missing more than 45 ECs at this stage need to take part in the MAP procedure for SET/AC/S&C of the next year.
- All pre-Master and international students enrolling in one of the MSc programs need to take part in the MAP procedure.

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<sup>3</sup> In order to safeguard quality of supervision in the S&C program, the number of students that can enroll in a particular section is Capped for all sections that are involved.

- The same regulations apply to transfer students (zij-instromers) enrolling in one of the MSc programs during the ongoing academic year. Transfer students may select and be assigned to an undersubscribed section after consultation with their academic advisor, or they can choose to take part in the first upcoming MAP procedure following their MSc subscription. The same holds for any BSc or MSc student who has for whatever reason not taken part in the MAP procedure of the running academic year.
- The MAP procedure will assign each of the students to a particular section. The validity of this assignment holds for a maximum of one year, until the Start of the MAP procedure of the next academic year. Students are expected to start their MSc program within that time frame. If it turns out that a student did not receive any credit points from his/her course program by then, the previous assignment is canceled, and the student needs to retake the complete MAP procedure of the next academic year. This regulation also applies to transfer students (zij-instromers) and all other students who did not initially take part in the MAP procedure of the running academic year.
- Enrolled students who have received credit points in their master program after allocation are not allowed to take part in the MAP procedure for the same program in the next academic years.
- Students enrolled in one of the Master's programs who wish to change their allocated section need to consult their academic advisor and can only be allocated to an undersubscribed section.
- Students who would like to change from the MSc program MW to one of the interdepartmental Master's programs AT, SET or S&C, or vice versa, cannot keep their allocation. They must take part in the MAP of the MSc program of their choice in the upcoming year. They can, however, be allocated to an undersubscribed section, after consultation with their academic advisor.
- In the MAP procedure for MW students who wish to follow the special Master's track MSE-W or AIES-W should indicate this in the procedure when submitting their section preferences
- In case of a preference for the special master track MSE-W or AIES-W the student first enrolls for the MW master in studielink and only after allocation to the special master track is finalized the CSA updates the enrollment to MSE-W or AIES-W.

- Students who are not covered by these regulations need to make an appointment with their academic advisor to discuss their options.

#### Fixing supervision capacity per section

The Dean and the section leaders of the sections determine the supervision capacity of each section once a year, i.e. fixing the maximum number of MSc students allowed to enroll in the section. The section's total supervision capacity is spread over the MSc programs (including the special Master's tracks MSE-W and AIES-W) in which the section participates.

- *Regarding the interdepartmental MSc programs SET, AT and SC*

An estimate will be made of the total number of students enrolling in each of the interdepartmental MSc programs. For the most popular sections participating in one of the interdepartmental MSc programs (so also for the popular sections from other departments) a maximum cap per program will be fixed and agreed upon. If it turns out that the total intake of students is larger than the estimated intake, the caps are adjusted proportionally.

- *Regarding the MSc program MW (including MSE-W and AIES-W)*

The total number of places available for Mechanical Engineering, including MSE-W and AIES-W will be larger than the total intake of Mechanical Engineering students. If it turns out that the total intake of students is larger than the estimated intake, the caps are adjusted proportionally. This implies that every student enrolled in the MSc program MW has the guarantee to be assigned to a section.

#### Selection Procedure

Students who wish to enroll in one of the MSc programs coordinated by Mechanical Engineering (MW, MSE-W, AIES-W, SET, AT and S&C) indicate in Osiris their 1st, 2nd and 3rd section preference and in case of MW also for each chosen section if this is in the MW, AIES-W or MSE-W track Students provide a CV and motivation letter, both in English, for their first choice via Canvas. Please use our guideline ([click here](#)) to get started. Students enrolled in the MSc program S&C also need to complete a questionnaire.

The oversubscribed sections within the department of Mechanical Engineering will select students based on several criteria to be reflected in the CV and motivation letter, such as choice of electives, professional skills, interests, extracurricular activities outside study, and so on. For the MSc program S&C also the sections from the department Electrical Engineering are involved in the selection process.

If a student has the opinion that the regulations and rules determined in this MAP procedure have not been respected, he/she can object via Education and Students Affair (ESA), see <https://studiegids.tue.nl/organisatie/regelingen-en-gedragcodes/studentenstatuut>.



Timeline + implementation MW (including MSE-W and AIES-W)

The assignment of students to a section enrolling in the MSc program Mechanical Engineering takes place at the end of Q4 of academic year 2020/21. Students enrolling in the Master's program MW can choose between 7 sections, some of these sections also participate in MSE-W and or AIES-W. For each chosen section students have to indicate if this in the MW, MSE-W or AIES-W track.

1. At the start of Q4 of each year, the total supervision capacity of each of the sections and an estimate of the division over the MSc programs will be communicated.
2. TU/e BSc students and Mechanical Engineering pre-Master's students indicate their 1st, 2nd and 3rd section preference. The deadline for this coincides with the end of Q4. Students must upload a CV + a motivation letter, both in English, for their 1st choice. Students first select a section and, if relevant, indicate whether they want to follow the MW, MSE-W or AIES-W track. Every section can only be selected once.
3. For all sections the department provides an overview of the number of students who have indicated a section as their 1<sup>st</sup> preference. The final number for the supervision capacity of each section and its division over the different MSc programs will also be listed.
4. Students are given the opportunity to change their initial choice and upload a modified CV and/or motivation letter.
5. Selection round 1: (*June 28 – June 30 2021*)
  - Students are assigned on the basis of their first choice if there is sufficient supervision capacity in the section of their preference;
  - Students are selected by the oversubscribed sections on the basis of their first choice based on the provided CVs and motivation letters. The outcome will be communicated via Canvas on July 1, 2020
6. Selection round 2: (*July 1 – July 2 2021*)
  - Students who are not selected after round 1 will be assigned to their second choice (or third choice if the second choice is full after selection round 1) if there is sufficient capacity in the corresponding section;
  - Students are selected by the oversubscribed sections on the basis of their second choice (or third choice if the second choice is full after selection round 1) based on their CV and motivation letter. The outcome will be communicated via Canvas on July 2 2021.

7. Students who have not been accepted for their second choice after selection round 2 will be assigned to their third choice if there is sufficient capacity in the corresponding section.
8. After two selection rounds, a small number of students may remain without an assigned section. A 'Match Making Meeting' will be organized together with the undersubscribed sections to ensure that these students are also offered an attractive position. To this end, existing cross links between undersubscribed and oversubscribed sections will be exploited. The Graduate Program Director will make a first proposal for a match of a student with a section on the basis of his/her 1st, 2nd and 3rd choice.
9. A small number of transfer students (zij-instromers) enrolls in the program halfway the year. These transfer students can be directly assigned to an undersubscribed section of their choice without any restriction or they can choose to take part in the MAP procedure of the upcoming new academic year.
10. Transfer and international students do not have access to Canvas. They will participate in the procedure and receive communication by email.

<ul style="list-style-type: none"> <li>- 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> research Section and Program (MW, MSE or AIES) preference in OSIRIS STUDENT</li> <li>- Upload CV + motivation letter in CANVAS 4MAPMW</li> </ul>	<h1 style="margin: 0;">Closed</h1>	<ul style="list-style-type: none"> <li>- Change preference for research section and/or program in OSIRIS STUDENT</li> <li>- Optionally upload new CV + motivation letter</li> </ul>	<h1 style="margin: 0;">Selection round 1</h1>	<h1 style="margin: 0;">Selection round 2 / 3</h1>
<p>21 April – 23 June, 2021</p>	<p>24 June 2021</p>	<p>24 June- 27 <u>June</u>, 2021</p>	<p>28 June 30 June, 2021</p>	<p>1 July - 2 <u>July</u>, 2021</p>