

**Study programme section of the Students' Charter  
with the 2022-2023 Teaching and Examination Regulations  
of the Master's programme**

Digital Technology Engineering

49156

Full-time

Eindhoven

SYSTEM DESIGN

Study programme code

Full-time and Part-time

Eindhoven

The study programme section of the Students' Charter was adopted by the institute's director on 31<sup>st</sup> of May 2022, after obtaining the IPC's consent on 30<sup>th</sup> of May 2022 and the PC's consent on 30<sup>th</sup> of May 2022.

The Teaching and Examination Regulations of the study programme expand on the institutional section of the Teaching and Examination Regulations of Fontys Master's programmes.

This general section for the **2022-2023** academic year was established by the Executive Board on **14 December 2021**, following the consent of the students' section of the CPC, which was given on **7 February 2022**.

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## A – Teaching and Examination Regulations

### Section 1 General

#### Article 1 Definitions

Academic year	The period from 1 September up to and including 31 August of the following year.
Accreditation of prior learning	Accreditation of prior learning awarded by a recognised provider of prior learning assessment and recognition.
Assessment	Generic term for tests aimed at assessing a student's competencies in a professional situation that is as authentic and realistic as possible.
Assessor	An examiner that grades the student's progress in acquiring the required competencies.
Certificate	The certificate as referred to in Section 7.11 of the Dutch Higher Education and Research Act ( <i>Wet op het Hoger Onderwijs en Wetenschappelijk Onderwijs</i> , WHW).
CAA	Centre for Administrative Activities. The CAA is the internal partner within Fontys of the representative and participatory bodies and their discussion partners with respect to optimising how these bodies function.
CPC	Central Participation Council
Cohort	The group of students who are enrolled for the first time in the first year of a study programme on the same reference date to which the prevailing Teaching and Examination Regulations (TER) apply. For students who enrol in a higher year, cohort membership is determined on an individual basis.
Competency	A cluster of related knowledge, skills and attitudes that influences a substantial part of a person's job, is related to the performance of the job, can be measured and tested against accepted standards and can be improved through training and development.
Component test	If an interim examination consists of several tests, each of those tests is referred to as a component test.
Credit	One credit equals 28 standard study-load hours. Students are awarded credits on passing the interim examination of a unit of study. The international term for credits is ECTS credits (EC's).
Education components CROHO	The courses offered to students to help their learning process. Central Register of Higher Education Study Programmes, which is a register of all study programmes. Students that pass the interim examinations of a study programme registered in CROHO are entitled to an official higher professional education certificate with the associated degree (associate degree, Bachelor or Master). The CROHO will be replaced by the RIO in 2022.
Deficiency	Any required prior qualification(s) a student lacks.
Diploma supplement	Document drawn up in accordance with a European format that is added to the certificate and states the nature, level, context, content and status of the study programme.
Dual-study programme	A dual-study programme is organised in such a way that education is alternated with one or more periods of professional practice related to the study programme. The study programme therefore consists of an educational segment and a professional placement segment, both of which are integral parts of the study programme.
DUO	Short for <i>Dienst Uitvoering Onderwijs</i> , a government agency charged with implementing education legislation and regulations.
ECTS	European Credit Transfer System. The system that is used to express credits in order to facilitate international comparison. See also: credits.
Elite athletes scheme EVC (RPL)	Scheme for elite athletes that specifies which students are eligible to benefit from it and the facilities that they may use under it. <i>Erkenning van eerder Verworven Competenties</i> (Recognition of Prior Learning).
Examination	Assessment administered by the Examination Board to determine whether students have successfully completed the educational components of a study programme or the foundation-year phase. The

Examination Appeals Board	<p>final examination may also include a supplementary assessment conducted by the Examination Board.</p> <p>The Board as referred to in Sections 7.60 up to and including 7.63 of the WHW and Articles 45 and 46 of the Students' Charter. The organisation, duties and powers of the Board are laid down in the Rules of Procedure adopted by the Examination Appeals Board and approved by the Executive Board.</p>
Examination Board Examiner	<p>The board of persons referred to in Section 7.12 of the WHW.</p> <p>Member of staff who is designated by the Examination Board to administer examinations and assess the results thereof or an external expert.</p>
Executive Board	<p>The administrative body of Fontys University of Applied Sciences, as described in the articles of association and the WHW.</p>
Exemption	<p>Full or partial exemption from meeting enrolment and/or admission conditions and/or sitting interim examinations.</p>
Exit qualifications	<p>Qualifications students must have on completing the study programme.</p>
Fraud	<p>Any act (including plagiarism ) or omission that either partially or fully impairs the correct assessment of a person's knowledge, insight, skills, competencies, professional attitude, powers of reflection, etc.</p>
Full-time study programme	<p>A full-time study programme is a study programme whose structure is such that students are assumed not to participate in any activities other than education components.</p>
Hardship clause	<p>A provision in a law or regulation that makes it possible to deviate from regulatory provisions in favour of the student or external student.</p>
He/him	<p>He/him is taken here to refer to men, women and individuals who do not identify as either of these options</p>
IELTS	<p>International English Language Teaching System, a tool used to determine a student's command of the English language.</p>
Institute	<p>The operational unit at Fontys that is, in particular, responsible for organising Fontys's core competencies and that executes the primary processes, i.e. the statutory tasks as referred to in Section 1.3, paragraphs 3 and 1.9(1) of the WHW.</p>
Institute Director	<p>The staff member charged with running a Fontys institution.</p>
Institution	<p>The Fontys Universities of Applied Sciences.</p>
Intake assessment	<p>Portfolio assessment conducted at the student's request to validate previous learning experiences prior to enrolment in the study programme. A fee covering the costs is charged for an intake assessment.</p>
Intake interview	<p>Interview conducted at the student's request prior to the start of the study programme if the student believes that he has competencies acquired previously. An intake interview comprises a general assessment from which no rights can be derived by a student.</p>
Interim examination	<p>An examination of the knowledge, understanding, skills and/or competencies of a student required to conclude a unit of study, including an assessment of the results of such an examination (<i>Section 7.10(1) of the WHW</i>). An interim examination may consist of one or more component tests.</p>
IPC	<p>Institute Participation Council</p>
Main subject	<p>A specific definition of the curriculum within a programme, which begins immediately from year 1 or following the foundation year</p>
Occupational requirements	<p>The legal requirements to which the practice of a particular profession is subject. The legal requirements to which the practice of a particular profession is subject (<i>Section 7.6 of the WHW</i>).</p>
Part-time study programme	<p>A part-time study programme is a study programme whose structure is such that the student is able to participate in supplementary activities, either work-related or educational, alongside education components.</p>
Portfolio	<p>A collection of evidence, digital or otherwise, with which students can demonstrate that they master the competencies of a particular study programme.</p>
Principle	<p>All study programmes offered are based on one of the following principles: non-denominational private education (NPE), Roman Catholic</p>

	(RC), Protestant Christian (PC) or a combination of non-denominational private education, Roman Catholic and Protestant Christian (NPE, RC, PC).
Profiling Fund Board	Board charged by the Executive Board with implementing the Profiling Fund scheme, formerly known as the FSS Board.
Profiling Fund Scheme	Scheme for the granting of support to students in the form of graduate funding, committee member grants or attendance fee from the profiling fund, now known as the <u>Profiling Fund Scheme</u> .
PC	Opleidingscommissie (Programme Committee, PC), a committee established for a particular study programme of an institute referred to in Section 10.3c of the Act (see the <u>Regulations on the Participation Councils and Degree PC's</u> ).
RIO	The register (Registratie Instellingen en Opleidingen) that will replace existing registers such as the CROHO and the BRIN.
Tailored programme	Special programme which differs from the standard programme.
Teaching period	Period in the academic year during which education components are organised. A teaching period is referred to as a study quarter in the Fontys annual calendar.
TER	Teaching and Examination Regulations. The TER consists of an institutional section for all study programmes offered by the Fontys Universities of Applied Sciences as well as information specific to individual study programmes. The TER forms a part of the study programme section of the Students' Charter.
Test	Activity used to assess whether a student has certain knowledge, insight, skills and/or competencies.
Student	A person who is enrolled in the institution, as referred to in Sections 7.32 up to and including 7.34 of the WHW.
Student counsellor	Staff member appointed by the Executive Board who is responsible for looking after the students' interests, providing assistance when problems occur and providing information and advice. The student counsellor is part of the Student Facilities Service ( <i>Dienst Studentenvoorzieningen</i> ).
Study Career Centre	Service provided by the Student Facilities Service ( <i>Dienst Studentenvoorzieningen</i> ) to help students with issues involving admission, transfer to another study programme/institute or the termination of their studies.
Studentcoach	Coach who provides guidance on issues relating to student progress, including those that stimulate a student to develop a personal and professional identity, focusing on a student's talents and personal leadership qualities.
Studentcoaching	System of guidance that focuses on the development of the individual student. It stimulates students to reflect on their own development as future practitioners of the profession and to take responsibility for their own development.
Students' Charter	The <u>charter</u> containing the rights and obligations of students, divided into an institutional section and a study programme section.
Study load	The standardised time investment expressed in units of 28 study load hours related to a study programme.
Student entrepreneur scheme	<u>Scheme</u> which is intended to help Fontys students who are deemed student entrepreneurs to combine entrepreneurship and study.
Study programme	A coherent totality of education components in which students participate as part of their education. Every study programme is recorded in the RIO.
Study programme profile	The entire set of exit qualifications for which the study programme provides training.
Unit of study	Part of a study programme that is concluded with an interim examination as referred to in Section 7.3(2) of the WHW or an additional assessment carried out by the Examination Board, as referred to in Section 7.10(2) of the WHW. Units of study may relate to the assessment of one or more competencies, a component of competencies (knowledge, insight, skills,

attitude) or a combination of competencies. Students are awarded the relevant credits on passing the interim examination for the unit of study. The Dutch Higher Education and Research Act (*Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek*, WHW; Bulletin of Acts and Decrees 593, 1992, and later supplements and amendments).

## Section 2 Admission to a Master's programme

### Article 2 Educational entry requirements

1. The following qualify as proof of admission for enrolment in a Master's programme:
  - a. an academic or higher professional education Bachelor's degree; or
  - b. possession of knowledge, insight and skills at the level of an academic or higher professional education Bachelor's degree (*Section 7.30(b) of the WHW*).
2. Admission to the study programme of System Design is subject to the following qualitative admission requirements: bachelor in Automotive, Aviation, Mechanical Engineering, Mechatronics, Electrical and Electronic Engineering, Aerospace technology, Marine Technology, Applied Physics, Applied Mathematics. Mechanical Engineering and Mechatronics.  
Admission to the study programme of Digital Technology Engineering is subject to the following qualitative admission requirements.  
A bachelor in Automotive, Aviation, Elektrotechniek, Engineering, Industrieel Product Ontwerpen, Logistics Engineering, Luchtvaarttechnologie, Maritieme techniek, Mechatronica, Mens en Techniek, Technische Bedrijfskunde, Toegepaste Wiskunde, Werktuigbouwkunde, HBO-ICT, Informatica, Technische Informatica, Technische Natuurkunde.
3. All prospective students who fulfil the stated requirements will be admitted, unless there is a maximum number of students that can be enrolled and this maximum would be exceeded by the admission of additional students.  
Both Master programs have no maximum amount of students.
4. If admission to the study programme is subject to an admission quota (see sub 3), then admission regulations will be laid down stipulating the number of available places and the procedures for the allocation of proofs of admission.  
There are no requirements for both Master programs.

### Article 3 Reparation of non-compliance of entry requirements

If the candidate does not comply with the entry requirements as referred to in article 2 and he may be expected to be able to meet them within a reasonable period of time, he will be offered the opportunity to repair them and yet meet the entry requirements.

### Article 4 Requirements regarding foreign diplomas/international students

1. Foreign prospective students from outside the EU who are 18 years of age or older on the date of their first enrolment must have a valid residence permit. (*Section 7.32 of the WHW*.)
2. Foreign students with a residence permit are required to earn at least 50% of the available credits each year. The IND will be informed if the student fails to meet this requirement, unless there are special circumstances due to which the student was unable to meet this requirement. Such a notification based on the same special circumstances may be withheld once during the course of each study programme.
3. For international<sup>1</sup> students, the following language requirement applies for admission to an English-language programme.
  - an average IELTS score of 6.0, for which the student must have a score of 6.0 for at least three components and may have a score below 6.0 for no more than one of the four components, provided this score is at least a 5.5.

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<sup>1</sup> According to the Code of Conduct International Student, the term 'international student' refers to a 'student with a foreign nationality who, in case of a third-country national on the basis of a residence permit granted to this effect, desires to continue, continues or has continued his/her full time education at a higher education institution in the Netherlands'.

A previously completed language test, with the exception of Cambridge, may be no more than two years old at the time the study commences, which can be either on 1 September or on 1 February.

Exemption may be granted for this requirement if the international student can submit a diploma from prior education that was obtained in a country in which English is the official language of instruction. If the diploma was granted more than two years ago, the student will be asked to demonstrate their language skills again, unless English is the only language of instruction in the country where the student obtained the diploma.

Test	Overall Score	Component	No more than 1 deviating component
<b>IELTS</b>	≥ 6,0		
• IELTS reading		≥ 6,0	≥ 5,5
• IELTS listening		≥ 6,0	≥ 5,5
• IELTS speaking		≥ 6,0	≥ 5,5
• IELTS writing		≥ 6,0	≥ 5,5
<b>Cambridge</b>	≥ 169		
• Cambridge reading		≥ 169	160 t/m 168
• Cambridge listening		≥ 169	160 t/m 168
• Cambridge speaking		≥ 169	160 t/m 168
• Cambridge writing		≥ 169	160 t/m 168
<b>TOEFL</b>	≥ 72 <sup>2</sup>		
• TOEFL reading		≥ 18	
• TOEFL listening		≥ 17	
• TOEFL speaking		≥ 20	
• TOEFL writing		≥ 17	
<b>TOEIC speaking and writing</b>	≥ 310		
• TOEIC speaking		≥ 160	-
• TOEIC writing		≥ 150	-
<b>TOEIC reading and listening</b>	≥ 785		
• TOEIC reading		≥ 385	-
• TOEIC listening		≥ 400	-

Please note: the TOEFL and TOEIC programmes do not have a deviating component, as the lower limit applied in the 'Test Component' table is already the B2 lower limit as well.

### Article 5 Professional activity requirements

The professional practice environment is not subject to any requirements.

### Section 3 Intake assessment, exemptions, short-track/tailored study programmes

#### Article 6 Intake interview

1. Students entering a study programme may be offered an intake interview if they have competencies previously acquired elsewhere. Students can include the evidence of the competencies previously acquired elsewhere in their portfolios or may use this evidence to substantiate a request for exemption before the Examination Board.

<sup>2</sup> A minimum score of 60 applies in the draft code of conduct that will come into effect on 1-9-2022.

2. Students who re-enrol after an interruption in a study programme in which they were previously enrolled will be required to take an intake interview to determine which part of the study programme still has to be completed. No intake interview is needed if agreements regarding re-enrolment in the study programme were already made with the Executive Board at the time that the student interrupted his study.
3. A study programme will be drawn up based on the assessment of the competencies previously acquired and will be submitted to the Examination Board for approval.

### **Article 7 Exemptions**

Students who believe they are eligible for an exemption must submit an application to that end to the Examination Board. The Examination Board may grant an exemption from one or more interim examinations on the grounds of a review of an assessment or the holding of a diploma or other certificate, accreditation of prior learning or similar document, such as proof of results achieved in a study programme taken at a research university or university of applied sciences and/or proof of administrative activities, with which the student can show that he has already met the requirements of the interim examination in question. Exemptions are recorded in the study progress system. The period of validity of the exemption is stated in the exemption decision.

### **Article 8 Short-track/tailored study programmes**

1. Students who believe they are able to proceed with and/or complete their study programmes at an accelerated pace may submit an application requesting such to the Examination Board. The student coach's advice must be enclosed with the application. The organisation of the study programme must be able to accommodate the short-track option.

## **Section 4 Facilities with reference to language, student coaching, special facilities for students with a functional disability, Elite athletes scheme, board memberships**

### **Article 9 Student coaching**

Every student is coached by a student coach. This is done as follows:

For the master Digital Technology Engineering: Every student will be guided by a student coach. Students who, due to special circumstances, need extra guidance make this known to their coach. Extra coaching will be held. A student is expected to report special circumstances to the coach if they arise.

For the master System Design: Students will be coached by the educational team. Since the education is a professional master, the students are considered to act independently and professionally. However at lectures time is available for questions and coaching. At the projects lecturers are available for support. During the graduation assignment lecturer is the coach and will periodically coordinate the assignment.

### **Article 9a Facilities for Dutch in English language programmes**

For Dutch students who are enrolled in an English language programme, the following facilities are offered: individual tutoring.

### **Article 10 Special facilities for students with a functional disability**

1. Students with a functional disability are legally entitled to effective adjustments, unless such adjustments would burden the institution disproportionately. (Section 7.13 of the WHW, Section 2a of the Equal Treatment of Disabled and Chronically Ill People Act.) See also <https://fontys.nl/fontyshelpt/Studentenbegeleiding/Bijzondere-omstandigheden.htm>.)
2. These adjusted facilities must be aimed at the removal or restriction of any obstacles and encourage the independence and full participation of the student as much as possible. The adjusted facilities may relate to the study programme (including internships), the timetables, and type of study programme, the tests and educational tools.
3. A student who seeks to have adjusted facilities must submit a written and substantiated application in good time to the Examination Board. If necessary, the Examination Board will seek an expert's advice (such as a student counsellor) before taking a decision. If the

Examination Board deems it necessary before taking a decision, it may confidentially inspect the medical certificate that may be available with the student counsellor, unless the student objects.

The Examination Board must decide within four working weeks after receipt of the application, unless it requires further inquiry, in which case the student will be informed as to when more clarity can be given with respect to his application.

4. In the case of a protracted or chronic disability, such an application will only have to be made once for the entire study programme; in all other cases once per testing period or academic year. In its decision to grant the facilities, the Examination Board may also rule that these will apply for the entire duration of the student's study or that the student is to consult with his student coach annually to discuss whether the facilities are still adequate.
5. At the beginning of the academic year the institute will inform students regarding the possibilities for special facilities. Students will be informed of their right to consult a student counsellor.

#### **Article 11 Students with board memberships**

1. Students can include any board memberships as part of their portfolios. In order to do so, they must describe, in consultation with their student coach, how the board membership can contribute to the acquisition of one or more competencies of their Master's programme.
2. Board memberships for the DPC, IPC, CPC, or for study associations, student associations and as members of committees at Fontys can be listed on the diploma supplement. The student must request the listing at least 6 weeks prior to the graduation ceremony via the study programme administration office, [engineeringeindhoven@fontys.nl](mailto:engineeringeindhoven@fontys.nl).  
At the request of the student's study programme, the Centre for Administrative Activities can confirm that the student has been an active board member of the CPC. In the case of board memberships of a PC or IPC, the study programme can request confirmation from the relevant IPC or PC.
3. Students who believe that their board memberships demonstrate that they have the knowledge, insight and/or skills that are assessed in particular tests may apply for an exemption from such tests from the Examination Board.
4. Facilitation for board memberships is laid down in the Fontys Regulations on the Participation councils and degree programme committees, the Regulations on board membership grants and the Remuneration scheme for committees and steering groups.

#### **Article 12 Elite Athletes scheme - Student entrepreneurship**

1. Students who have been granted an Elite Athletes or Talent status are entitled to facilities from the Elite Athletes Scheme. Facilities regarding the adjustment of tests or test timetables, an adjusted arrangement regarding compulsory attendance, working in groups and an adjusted internship must be sought from examination board.
2. Students who are eligible for the Student Entrepreneurship Scheme may apply to the Examination Board, among others, for facilities regarding the adjustment of tests or test timetables, an adjusted arrangement regarding compulsory attendance for education components, working in groups and an adjusted internship. These facilities should be sought from examination board.

### **Section 5 Study programme content**

#### **Article 13 Study programme profile – main subjects – occupational requirements**

1. The study programme is based on a study programme profile. The exit qualifications of the study programme are described in the study programme profile. The study programme for the Master System Design profile can be found in the attachment study programme profile MSD and the study programme for the Master Digital Technology Engineering can be found in attachment study programme profile MDTE.
2. The study programme for the Master System Design has the following main subjects: Innovation Engineering, System Design: Architecture & Engineering, Modelling & Simulation, Control Engineering as well as professionalization skills. The study programme for the Master Digital Technology Engineering has no main subjects
3. The principle of the study programme is mentioned in the Register of Study Programmes

4. The study programme does not impose any specific occupational requirements, laid down in the following laws and regulations.

#### **Article 14 Study programme layout**

The Master's programme has a study load of 120 credits. The nominal study load is 60 credits per year.

#### **Article 15 Overview of units of study and credits**

1. Every study programme consists of a coherent set of units of study, which are components of a study programme concluded with an interim examination. For the Master Digital Technology Engineering units of study cannot exceed 30 credits.
2. Only whole credits are awarded for units of study. In the overview included in the TER tables you will find an overview of the distribution of credits.

#### **Article 16 Education components – *learning environment***

1. Below is an overview of the education components that are part of the study programme. Education takes place in a learning environment. For the master System Design this may be found in the Study programme profile, where there is an overview of the education components and the learning outcomes that are part of the study programme. For the master Digital Technology Engineering this may be found in Attachment Units related to learning outcomes and study load, where there is an overview of the education components that are part of the study programme. For the educational activities, a reference is made to course manuals. An overview of all learning outcomes can be found in attachment Overview of all learning outcomes MDTE.
2. Any entry requirements a student must meet before participating in a course or educational activity are stated in the overview as referred to in paragraph 1.
3. Enrolment in the educational activities is required. The procedure can be found in appendix Application procedure for educational activities.
4. The timetable for the master System Design is announced by the Fontys portal no later than 3 weeks prior to the start of classes. The timetable for the Digital Technology Engineering is announced in Canvas no later than 3 weeks prior to the start of classes.
5. Students who have registered for a course or educational activity must ensure that they meet the specific entry requirements. The overview in Article 16, paragraph 1, indicates the education components to which requirements apply for participation as well as the nature of these requirements. If the requirements concern compulsory attendance, students who are eligible for the Elite athletes scheme or the Student entrepreneur scheme can apply to meet this requirement in a parallel group or for exemption from this obligation (see also Article 12).

#### **Article 16a - Evaluation of teaching**

The teaching provided during the study programme is evaluated in the following way.

Education in the programme is evaluated by quantitative and qualitative evaluations by students at the end of the offer of educational activities.

The educational evaluations and resulting improvement actions for the master System Design: will be taken care of by the Programme Committee and can be viewed by students. The educational evaluations and resulting improvement actions for the master Digital Technology Engineering are reported back to lecturers and students under the responsibility of the respective coordinators.

### **Section 6 Tests, evidence, assessment and study progress**

#### **Article 17 Types of tests - evidence**

1. A test consists of/may consist of:

- a. one or more mandatory tests or mandatory partial tests;
  - b. freely-chosen evidence evaluated as an assessment, such as a portfolio;
  - c. a combination of a) and b).
2. Tests are conducted in writing or orally or in a fashion that combines both writing and oral delivery (e.g. product and presentation/interview).
3. An oral examination, including an assessment, is conducted by at least two examiners. A report must always be drawn up of an oral test *on a specially designed evaluation form* an assessment of the quality of the evaluation afterwards. A test may be conducted by a single examiner only following the approval of the Examination Board and provided the student does not object.  
An oral test is held in public. Interested parties who wish to attend an oral test must submit a request to that effect to the examiner(s) at least two weeks before the test is held. The examiner must inform the student who is taking the test. If the student objects, the request to attend the oral test will in any event be rejected. Any rejection by the examiner will be substantiated.  
When the Examination Board offers students the possibility to sit an additional oral test by way of replacement of a regular test, it will always be conducted and assessed by two examiners.
4. If a test consists of an assessment of freely-chosen evidence, the programme should allow the student to collect such evidence and receive feedback from the examiners, external experts and/or peers.  
The requirements that the evidence must meet are given in the assessment guide that will be published on Canvas for the Master DTE.  
The Master SD doesn't have freely chosen assignments. The graduation assignment can be submitted by the student, but is assessed by the lecturer on the multidisciplinary, complexity and independence of the person performing it.

#### **Article 18 Tests and assessments**

1. The Examination Board will designate one or more examiners for each test. An examiner can also be an external expert.

#### **Article 19 Content of tests, duration of the test and test aids and test timetables**

1. The content of the test, including the learning objectives, is described in the study program profile via Canvas and is made available to students at least 6 weeks before the start of the year for the Master System Design and at least 6 weeks before the start of the programme for the Master Digital Technology Engineering.
2. The examiner determines the period of time allowed to students to take the test as well as any aids that students may use during the test, subject to the guidelines and instructions provided by the Examination Board. This information must be stated on the examination paper.
3. The test timetable will be published through the portal no later than 3 weeks before the start of the test period in question.

#### **Article 20 Registration for tests**

Students for the master Digital Technology Engineering must register for every test in accordance with the procedure in appendix Enrolment process exams.

For the master System Design: students who sign up for a course are also enrolled in the exam.

#### **Article 21 Proof of identity during tests**

Students must prove their identity at every test by showing a legally valid form of ID other than a student ID card.

#### **Article 22 Test marking system**

1. The assignments, questions, assessment norms and criteria are determined by the examiners with due regard for the guidelines and instructions provided by the Examination Board. The

- examiner conducts the test and determines the result on the basis of the determined assessment standards and assessment criteria.
2. If one and the same test is conducted and assessed by more than one examiner, the Examination Board will ensure that the examiners adhere to the same standards and criteria.

### **Article 23 Test results**

1. The test results must be announced in writing to the student within ten days of the date of the test unless there are exceptions laid down in the Teaching and Examination Regulations. The study programme administration is responsible for announcing the test results. The privacy of students will be respected when test results are announced.
2. Students are entitled to inspect all assessed tests and the accompanying assessment criteria used and to be given feedback on the results.
3. Inspection is subject to the procedure described below.  
The results of every examination, including the scores on the criteria on the assessment form, will be published for the master System Design by the Education office in progress. Students can inspect them at any moment after the publication. For the master Digital Technology Engineering the results will be published online using Gradework. Students can inspect them at any moment after the publication.
4. Feedback is given according to the following procedure.  
Students from the master System Design will be given written feedback on the assessment form published in progress. Students who have failed an assignment and need more specific feedback, can make an appointment with their examiner.  
Students from the master Digital Technology Engineering will be given written feedback on the assessment form published in Gradework. Students who have failed an assignment and need more specific feedback, can make an appointment with their examiner.
5. Students will receive written notification of their results at least once a year, from which notification students may derive rights.

### **Article 24 Inability to sit tests**

1. Students who have acted in accordance with the registration procedure described in Article 20 but who are unable to sit the test for reasons beyond their control, the legitimacy of which reasons is subject to assessment by the Examination Board, may apply to the Examination Board to sit the test within a period of time to be set by the Board.
2. The application referred to in the previous paragraph must be submitted in writing to the chairman of the Examination Board and include the necessary evidence (see Article 33(3)). The Examination Board will then take a decision and inform the student concerned. If the request is granted, the Examination Board will set a date, time and place for the test. Any rejection of the request will be substantiated and the student will be informed of his right to appeal. In assessing the request, the Examination Board's primary criteria are the obstruction of the study progress and the student's personal circumstances.

### **Article 25 Request for a review**

1. Students who do not agree with an assessment can submit a request for a review of the assessment to the Examination Board within 4 working weeks after the date of the assessment (see Article 33(3) of these Teaching and Examination Regulations and Article 44 of the Students' Charter). The Examination Board must take a decision within 4 working weeks at a maximum.
2. Students may also appeal directly to the Examination Appeals Board within 6 calendar weeks after the date of the assessment via [www.fontys.nl/studentenloket](http://www.fontys.nl/studentenloket). (see Article 45 and Article 46 of the Students' Charter).

### **Article 26 Resits**

1. Tests are conducted at least twice an academic year.  
Students can resit components marked with a pass no more than once, and at least once, in which case the highest mark will count.
2. At least two opportunities to take tests that assess the material they have learned will be offered. Following these two test opportunities, the material to be studied for the test may be adapted to the material offered in the teaching block prior to the test. An up-to-date description

of the material to be tested can be found via the 'Master guide', which include measuring & assessing in the master DTE.

3. If a test consists of an assessment of freely-chosen evidence, then the programme should offer the student the following option of improving or supplementing the evidence.

#### **Article 27 Period of validity of results - evidence**

1. The period of validity of successfully completed component tests is 10 years.  
The validity period for evidence is 10 years.  
Results achieved for interim examinations can only lapse if the understanding/knowledge/skills to which these interim examinations relate can be shown to be obsolete. Understanding, knowledge and skills that were assessed more than 10 years ago can evidently be shown to be obsolete.  
The period of validity of successfully completed interim examinations is 10 years.  
The Examination Board may extend this term.
2. In the event of special circumstances as referred to in the Profiling Fund Scheme, the period of validity of interim examinations will as a minimum be extended by the duration of the support granted on the basis of that scheme.
3. If the study programme has been substantially altered, details on how this term will be restricted can be stated below, whether in the form of a written decision issued to a student or incorporation in the Teaching and Examination Regulations, if it applies to the entire cohort.

#### **Article 28 Graduation product - Knowledge bank**

Final papers of the study programme of the Master System Design can be entered in a knowledge bank, with exception of the competition-sensitive information.

Graduation products of the study programme Master Digital Technology Engineering are not entered in a knowledge bank.

#### **Article 29 Study progress**

The study programme is responsible for recording the test results in the programme administration.

### **Section 7 Graduation**

#### **Article 30 Examinations - certificates - diploma supplement**

1. Students have passed the examination of the study programme if they have passed all units of study which form part of the study programme, as referred to in Article 15. (*Section 7.10 of the WHW.*)
2. The certificate will only be given after it has been established that the student is enrolled and has paid his tuition fees for all the enrolment years. (*Section 7.11 of the WHW.*)
3. After successful completion of the examination, the Examination Board awards the certificate. The certificate is dated on the date of the student's final academic activity (test or assessment). The certificate of a study programme comes with a diploma supplement. This diploma supplement may include mention of a student's board activities (see Article 11). Students who have served as members of the Examination Appeals Board may also request that activity to be included on their diploma supplement.  
The Examination Board will determine that the student has passed within a maximum of eight calendar weeks after the last academic activity (test or assessment).  
If the student wishes for the certificate to be dated later, the student must postpone the completion of his final academic activity (test or assessment).
4. The certificate is signed on behalf of the Examination Board by the (deputy) chairman, the (deputy) secretary, the candidate and, if applicable, an external expert. (*Section 7.11 of the WHW*). On behalf of the Executive Board, the Examination Board also confers on the student the degree of the study programme if the student has taken the study programme examination. For the study programme's examination the master of science degree is awarded.
5. The award ceremony takes place at a time decided by the institute.
6. The certificates of students whose performance has been extraordinary will state the distinctions referred to below. For the Master System Design the distinction 'cum laude' is the

highest degree possible. Students will be awarded the distinction 'cum laude' if they meet the following criteria:

Cum Laude is given when a student has obtained an '>=8.0' for 6 or more modules, the remaining modules at an '>=7.0' and the graduation project at an '>=8.0'.

For the master Digital Technology Engineering no classification is mentioned on the certificate.

7. The Executive Board reports to DUO the students that have passed the examination of the study programme.

#### **Article 31 Statement on departure**

1. Every student who seeks to terminate his enrolment without having passed the study programme's final examination will be invited for an interview.
2. At the student's request, the student may be issued a statement listing any results achieved. (*Section 7.11 of the WHW.*)
3. The statement must specify that the test results will in principle be valid for 10 years. The statement can include a reservation in the event of a substantial overhaul of the study programme (see also Article 27).

### **Section 8 Irregularities and fraud**

#### **Article 32 Irregularities and fraud**

1. If irregularities are discovered in connection with a test, as a result of which the Examination Board cannot guarantee the test's quality and any of its results, the Examination Board may forgo having the test checked, or declare a test result void. In such cases, the Examination Board must ensure that an opportunity to resit the test in the near future is offered to the affected students.
2. If a student is guilty of an irregularity committed with respect to (a component of) an examination or fraud, the Examination Board may exclude the student from sitting one or more tests of the study programme for a period to be determined by the Examination Board but which will not exceed one year. Any act that contravenes the regulations that have been established regarding testing and assessment shall be considered fraud in the sense of this article. If the test has already been assessed, the result will be declared void.
3. In the case of serious fraud, the Examination Board can propose to the Executive Board that the enrolment of the student involved be prematurely terminated (*Section 7.12b of the WHW.*)
4. If the irregularity is only discovered after the examination, the Examination Board may withhold or claim back the certificate of the study programme or decide that the certificate will not be issued unless the student sits a new test or examination in the components to be determined by the Examination Board and in a fashion to be determined by the Examination Board.
5. Before taking a decision, the Examination Board will hear the student and any other interested parties. A report will be drawn up of this hearing, of which a copy is forwarded to the student. The Examination Board must notify the student of its decision without delay, which notification can be given orally if required but must in any event also be issued in writing. Furthermore, the student is informed of his right of appeal.
6. The Examination Board makes up a report of its decision and the facts it is based on.

### **Section 9 Examination Board, appeal**

#### **Article 33 Examination Board**

1. The institute director establishes an Examination Board for each study programme or group of study programmes.
2. The Examination Board's duties and responsibilities are laid down in the WHW. (Sections 7.12, 7.12b and 7.12c of the WHW). These include the following duties and responsibilities:
  - responsibility for guaranteeing the quality of testing;

- responsibility for guaranteeing the quality of the organisation of and the procedures surrounding tests and examinations;
  - to determine objectively and professionally whether a student has passed an examination;
  - to award certificates and the diploma supplement;
  - to determine alternative tracks;
  - to assess applications for exemptions and reviews and to award applications for special facilities;
  - to determine whether an interim examination has been conducted in a way other than that prescribed in the TER;
- The composition of the Examination Board can be found in the Appendix 'Composition of the Examination Board' with regard to the program chamber for each master individually.
3. An application to the Examination Board can be submitted to [examencommissie-engineering@fontys.nl](mailto:examencommissie-engineering@fontys.nl) (see also Article 24(2) and Article 25).

### **Article 34 Appeals**

Student who do not agree with a decision of the Examination Board can lodge an appeal against this decision within six calendar weeks after the date of the decision with the Examination Appeals Board via [www.studentenloket.nl](http://www.studentenloket.nl) (see Articles 45 and 46 of the Student's Charter. (Section 7.61 of the WHW.)

Students can contact the Student Counselling Office ([iStudent@fontys.nl](mailto:iStudent@fontys.nl)) for help on lodging an appeal.

## **Section 10 Retention and hardship clause**

### **Article 35 Retention of documentation**

1. The Examination Board is responsible for retaining the minutes of its meetings and its decisions for a period of seven years.
2. The Examination Board is responsible for retaining its issued statements, among others, the statement on departure of a student who terminates his enrolment without having passed the study programme's final examination, for a period of ten years.
3. The Examination Board will ensure that the following information on each student will remain in the institute's archives for 50 years:
  - information on whether each student has obtained a certificate of higher professional education including the list of marks.
4. The institute director is responsible for retaining test papers/assignments, assessment criteria, marking standardisation, pass marks, test matrices and test analyses for a period of seven years.
5. The institute director is responsible for retaining the lists drawn up and signed by the examiners containing the results achieved for a period of ten years.
6. The institute director is responsible for ensuring that all final papers and other kinds of tests in which students demonstrate their command of all aspects of the final attainment level, including assessments, will be kept for a period of seven years.
7. For the purpose of the external assessment of the programme in connection with accreditation, the institute director will ensure retention of a representative set of tests, including assessments, for a period of two years after the assessment.
8. The institute director is responsible for ensuring that the work completed by the student (written and non-written, including digital work) including assessments, with the exception of the work forming part of the representative set of final papers, is either destroyed or returned to the student after the expiry of a term of at least six months following the publication of the result. This term may be extended if necessary in connection with an appeal procedure.

### **Article 36 Hardship clause**

1. The Examination Board can make provisions for serious injustices that occur as a result of the application of these rules; it can also make decisions in cases not provided for by these rules. In order to decide whether the hardship clause must be applied, the Examination Board must

- weigh the interests of the student concerned and those of the study programme. Cases requiring immediate action may be heard by the chairperson of the Examination Board or his deputy after which the other members must be notified as soon as possible.
2. Students must apply in writing, stating reasons, to the Examination Board for the application of the hardship clause in accordance with Article 44 of the Students' Charter. The Examination Board decides on the student's application and communicates this decision in writing, stating reasons, to the student concerned, who is also informed of his right of appeal.

## **Section 11 Final provisions and implementation**

### **Article 37 Entry into force, amendments, publication and official title**

1. The TER applies to all students enrolled in the study programme in question during the 2022–2023 academic year, *unless otherwise stated below*.
2. The general section of these regulations and any amendments thereto will be established by the Executive Board, after having obtained the consent of the students' section of the Central Participation Council. PC's will be given an opportunity to issue advice to the CPC. That general section of the TER constitutes the basis on which the study programme-specific TER for each study programme will be drawn up before being submitted to the Examination Board for their advice and the (joint) PC and IPC for their advice/consent. The (joint) PC advises the institute director and sends its advice to the IPC for informational purposes. The IPC advises the institute director and sends its advice to the (joint) PC. The establishment of and amendments to the study programme-specific TER are effected following a proposal from the institute and require the consent of the students' section of the competent IPC and the (joint) PC. (see Sections 10.3c, 10.20 and 7.13 of the WHW.)
3. The text of the TER can be amended if warranted by changes to the organisation or organisational components with due observance of the provisions of paragraph 4. In the event of an interim change, the procedure as described in paragraph 2 applies.
4. If the interests of an individual student are prejudiced as a result of interim amendments of the regulations, the student may submit a written application to the Examination Board to protest against the amendment of the rules. The Examination Board examines the student's application and bases its decision on a weighing-up of the interest of the individual student on the one hand and the interest of the quality of the study programme on the other.
5. The institute director adopts the study programme-specific TER before 1 June of the academic year preceding the academic year that starts on 1 September. He ensures the publication of the study programme-specific component of these regulations and any amendments thereto by making them available for inspection with the secretariat of the study programme and placing them on the website.
6. The official title of these rules is 'Institutional Section of the Teaching and Examination Regulations of Fontys'.  
The official title of the TER of the Master's programme is "Engineering Masters DTE & SD 2022-2023."

### **Article 38 Transitional provisions**

When a study programme is subject to a substantial overhaul, the following transitional provisions will apply.

After the last regular activities of the 'old' programme and the related test or examination have been completed, this test or examination will be held two more times by way of resits. After that, it will be decided which test or examination that is part of the 'new' programme the student must sit to replace the 'old' one.

### **Article 39 Unforeseen cases**

The Examination Board decides in all cases not provided for by the study programme-specific part of the TER, unless the issue is covered by the institute director's competency.

## **B - Set-up of the study programme and support facilities**

### 1. Set-up, organisation and execution of the study programmes

Information on the set-up, organisation and execution of the study programmes can be found in:

- the study programme's digital prospectus
- the Teaching and Examination Regulations (see under A).

### 2. Facilities for students

Information on facilities for students can be found at:

- the institutional section of the Fontys Students' Charter ([www.fontys.edu/rules](http://www.fontys.edu/rules))
- the website of Fontys, among others, Fontys helps
- the website of [Fontys Study Abroad](#)
- the study programme's digital prospectus

### 3. Study support

Information on study support can be found in:

- the Teaching and Examination Regulations (see under A)
- the study programme's digital prospectus

## **C - Internal complaints procedure**

Students whose interests are directly affected by acts carried out by a staff member or a student against them, or who have a grievance regarding organisational matters, may lodge a complaint with the Executive Board, as described in Article 47 of the Students' Charter.

## **Appendices**

TER table Master System Design

TER table Master Digital Technology Engineering

Study programme profile MSD

Study programme profile MDTE

Overview of all learning outcomes MDTE

Units related to learning outcomes and study load MDTE

Enrolment process exams

TER table Master System Design

semester	code	Name	EC	Name test	Type of test	Assesment type	assesment scale	prerequisites	norm/compensation
Y1-S1	SASDA	System Design: Architecture & Engineering	5	SASDAT	Written Exam	Individual	1,0-10,0	n. a.	SASDA = (SASDAT + SASDAP)/2 ≥ 5,5 and SASDAT ≥ 5.5 & SASDAP ≥ 5.5
				SASDAP	Assignment	Group	1,0-10,0		
Y1-S1	SAMDP	Mechanics / Design principles	5	SAMDPT	Written Exam	Individual	1,0-10,0	n. a.	SAMDP = (SAMDPT + SAMDPP)/2 ≥ 5.5 and SAMDPT ≥ 5.5 & SAMDPP ≥ 5.5
				SAMDPP	Assignment	Group	1,0-10,0		
Y1-S1	SADTM	Dynamics & Thermo Mechanics	7	SADTMT	Written Exam	Individual	1,0-10,0	n. a.	SADTM = (SADTMT + SADTMP)/2 ≥ 5.5 and SADTMT ≥ 5.5 & SADTMP ≥ 5.5
				SADTMP	Assignment	Individual	1,0-10,0		
Y1-S1	SADIPE	Data and Image Processing in Engineering (DIPE)	3	SADIPET	Written Exam	Individual	1,0-10,0	n. a.	SADIPE = (SADIPET + SADIPEP)/2 ≥ 5.5 and SADIPET ≥ 5.5 & SADIPEP ≥ 5.5
				SADIPEP	Assignment	Individual/Duo	1,0-10,0		
Y1-S1	SAPA1	Project SDA-MDP	5	SAPA1SDA	project	Individual/Group	1,0-10,0	n. a.	SAPA1 = (SAPA1SDA + SAPA1MDP)/2 ≥ 5.5 and SAPA1SDA ≥ 5.5 & SAPA1MDP ≥ 5.5
				SAPA1MDP	project	Individual/Group	1,0-10,0	n. a.	
Y1-S1	SAPA2	Project DTM-AIT	5	SAPA2DTM	project	Individual/Group	1,0-10,0	n. a.	SAPA2 = (SAPA2DTM + SAPA2AIT)/2 ≥ 5.5 and SAPA2DTM ≥ 5.5 & SAPA2AIT ≥ 5.5
				SAPA2AIT	project	Individual/Group	1,0-10,0	n. a.	
Y1S2	SAMST	Modeling & Simulation	5	SAMSTP1	Presentation	Group	1,0-10,0	n. a.	SAMST = (0,4*SAMSTP1 + 0,6*SAMSTP2) ≥ 5.5 and SAMSTT ≥ 5.5 & SAMSTP ≥ 5.5
				SAMSTP2	Assignment	Individual/Duo	1,0-10,0		
Y1S2	SAMSA	Measurement systems, sensors and actuators	5	SAMSAT	Oral Exam	Group/Individual	1,0-10,0	n. a.	SAMSA = (SAMSAT + SAMSAP)/2 ≥ 5.5 and SAMSAT ≥ 5.5 & SAMSAP ≥ 5.5
				SAMSAP	Assignment	Group/Individual	1/5		
Y1S2	SAIER	Innovation Engineering & Research methods	5	SAIERT	Written Exam	Individual	1,0-10,0	n. a.	SAIER = (SAIERT + SAIERP)/2 ≥ 5.5 and SAIERT ≥ 5.5 & SAIERP ≥ 5.5
				SAIERP	Assignment	Individual	1,0-10,0		
Y1S2	SACET	Control Engineering	5	SACETT	Written Exam	Individual	1,0-10,0	n. a.	SACETT ≥ 5.5
Y1S2	SAPS1	Project MST-MSA	5	SAPS1MST	project	Group/Individual	1,0-10,0	n. a.	SAPS1 = (SAPS1MST + SAPS1MSA)/2 ≥ 5.5 and SAPS1MST ≥ 5.5 & SAPS1MSA ≥ 5.5
				SAPS1MSA	project	Group/Individual	1,0-10,0	n. a.	
Y1S2	SAPS2	Project IER-CET	5	SAPS2CET1	project	Group/Individual	1,0-10,0	n. a.	SAPS2 = (SAPS2CET1 + SAPS2IER)/2 ≥ 5.5 and SAPS2CET2=S, SAPS2CET1 ≥ 5.5 & SAPS2IER ≥ 5.5
				SAPS2CET2	Assignment	Duo/Individual	1/5		
				SAPS2IER	Assignment	Group	1,0-10		

TER table Master Digital Technology Engineering

cohort: 2021 VT

studiefase	Onderwijs eenheid	Naam onderwijs eenheid	Studiepunten	Naam toets	Naam v.d. toets	Toetsvorm	individueel/ groepsproduct	Beoordeling sschaal	Weging toets binnen onderwijs-eenheid	minimaal te behalen	ingangseisen
Year 1	DADT	Digital Technologies	20	DADTP1	Practical assignment Data-Pipeline with visualization	Practical assignment	Individual	1,0-10,0	1/4	5,5	Not applicable
				DADTP2	Practical Assignment Neural Network	Practical assignment	Individual	1,0-10,0	1/4	5,5	Not applicable
				DADTP3	Practical assignment Human Technology Interaction	Practical assignment	Individual	1,0-10,0	1/4	5,5	Not applicable
				DADTP4	Practical assignment Data Analysis	Practical assignment	Individual	1,0-10,0	1/4	5,5	Not applicable
	DAPBR	Practice-based research	12	DAPBRP1	Assignment Research proposal	Report	Individual	1,0-10,0	1/3	5,5	Not applicable
				DAPBRP2	Assignment Research Data analysis	Report	Group	1,0-10,0	1/3	5,5	Not applicable
				DAPBRP3	Assignment Research report	Report	Group	1,0-10,0	1/3	5,5	Not applicable
	DASE	Systems engineering	12	DASE	Portfolio assessment	Portfolio	Individual	1,0-10,0	1	5,5	Not applicable
	DADW	Design-based working	10	DADW	Portfolio assessment	Portfolio	Individual	1,0-10,0	1	5,5	Not applicable
	DAPPI	Personal and professional identity	6	DAPPI	Portfolio assessment	Portfolio	Individual	1,0-10,0	1	5,5	Not applicable



semester	unit of study	name unit of study	credits	name of test	type of test	assessment type	assessment scale	prerequisites	norm/compensation
D1-S1	DADTP1	DT Practical assignment Data-Pipeline with visualization	5.00	DADTP1	Practical Assignment	Individual	1,0-10,0	nvt	Minimaal 5,5
	DAPBRP1	PBR Assignment Research proposal	4.00	DAPBRP1	Report/verslag	Individual	1,0-10,0	nvt	Minimaal 5,5
D1-S2	DADTP2	DT Practical Assignment Neural Network	5.00	DADTP2	Practical Assignment	Individual	1,0-10,0	nvt	Minimaal 5,5
	DAPBRP2	PBR Assignment Research Data analysis	4.00	DAPBRP2	Report/verslag	Group	1,0-10,0	nvt	Minimaal 5,5
D1-S3	DADTP3	DT Practical assignment Human Technology Interaction	5.00	DADTP3	Practical Assignment	Individual	1,0-10,0	nvt	Minimaal 5,5
	DADTP4	DT Practical assignment Data Analysis	5.00	DADTP4	Practical Assignment	Individual	1,0-10,0	nvt	Minimaal 5,5
	DADW	DW Portfolio assessment	10.00	DADW	Portfolio	Individual	1,0-10,0	nvt	Minimaal 5,5
	DAPBRP3	PBR Assignment Research report	4.00	DAPBRP3	Report/verslag	Group	1,0-10,0	nvt	Minimaal 5,5
	DAPPI	PPI Portfolio assessment	6.00	DAPPI	Portfolio	Individual	1,0-10,0	nvt	Minimaal 5,5
	DASE	SE Portfolio assessment	12.00	DASE	Portfolio	Individual	1,0-10,0	nvt	Minimaal 5,5

## Study programme profile MSD

<b>1</b>	General information		
Short Code	SDA		
Name	System Design: Architecture & Engineering		
Year	1		
Semester	Autumn first year		
EC's	5		
Name of exam in progress	SASDA		
<b>2</b>	Module description		
Module description	<p>System Design: Architecture and Engineering will mainly deal with the technical aspects necessary to run, manage, design and deploy (large) complex systems successfully.</p> <p>The Systems Engineering processes will be discussed, following the V-model as design philosophy. Students will work on a case parallel to the course, going through the Systems Engineering cycle themselves, so the theory will take root.</p> <p>In view of the most recent developments, Model Based System Engineering (MBSE) and Model Based Design (MBD) will be used.</p>		
<b>3</b>	Learning outcomes		
learning outcome	Learning outcomes	Level of learning outcome	weight in exam
Learning outcomes 1	able to use the V-model in a systems Engineering context	understand, apply	0-30
Learning outcomes 2	able to draw up stakeholder needs, user-, system- and design-specifications	analyse, evaluate, create	0-30
Learning outcomes 3	able to make a functional decomposition of the system and draw up a system architecture	analyse, evaluate, create	0-30
Learning outcomes 4	able to perform risk analyses, draw up error budgets and use decision models	understand, apply	0-30
Learning outcomes 5	able to use MBSE software (Matlab system composer) to model and simulate systems	understand, apply	0-30
Learning outcomes 6	able to draw up and execute test plans, verification plans and validation plans	analyse, evaluate, create	0-30
Learning outcomes 7			
Learning outcomes 8			
Learning outcomes 9			

Learning outcomes 10  
 Learning outcomes 11  
 Learning outcomes 12

Analyze X  
 Design X  
 Realize  
 Control  
 Manage  
 Advize  
 Research  
 Professionalize

<b>4</b>	Organisation
Course duration	<a href="#">20 weeks</a>
Contact hours	<a href="#">On average 1 times per week 2 hours during 14 weeks</a>
Regular exam	<a href="#">18th week of semester (= Assesment)</a>
Resit exam	<a href="#">20th week of semester (=Assesment)</a>

<b>5</b>	Teaching materials
teaching material 1	<a href="#">Systems Design and Engineering: Facilitating Multidisciplinary Development Projects. G Maarten Bonnema, Karel T Veenvliet, Jan F Broenink</a>
teaching material 2	<a href="#">Guide to the Systems Engineering Body of Knowledge (SEBoK), version 2.2, Released 31 October 2019</a>
teaching material 3	<a href="#">NASA Systems Engineering Handbook.  https://www.nasa.gov/sites/default/files/atoms/files/nasa_systems_engineering_handbook_0.pdf</a>
teaching material 4	<a href="#">Gaudi System Engineering, https://www.gaudisite.nl/</a>
teaching material 5	<a href="#">IncoSE Systems Engineering Handbook: A Guide for System Life Cycle Processes and Activities, IncoSE</a>
teaching material 6	<a href="#">A guide to the Project Management Body of Knowledge (PMBOK), edition 2000. Project management institute</a>

<b>6</b>	Required knowlegde
Assumed knowlegd of	

<b>7</b>	Didactics
didactics 1	<a href="#">Theory</a>
didactics 2	<a href="#">Exercises</a>
didactics 3	<a href="#">Assignments</a>
didactics 4	
didactics 5	

<b>8</b>	Examination
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Type of exam TER	assignment and written	Pass / No Pass
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**Team Project**

The in-class team project and the individual home exam provide the student with an opportunity to fulfill the following educational objectives:

- Apply and improve the students' ability to work effectively in teams and to communicate with others on systems engineering matters.
- Apply the systems engineering knowledge and techniques acquired in this course.
- Integrate the knowledge, concepts and ideas acquired in this course.

exam info semesterguide 1

exam info semesterguide 2

Exam - Part I Read the questions carefully and address exactly what is asked for.  
Part I is a individual repetition of the activities performed in the class exercises.

50%

Exam - Part II

- a) Formulate a one sentence problem statement. Then create a Conops/context diagram describing the problem domain. Briefly describe the items you place on your diagram.
- b) Next, identify the stakeholders of the problem and their needs. Write four stakeholder requirements (identify the originating stakeholder).
- c) Suggest 3 concepts that might meet the requirements, select the best concept based on AHP approach and explain the limitation of using this decision-making method.
- d) Write 4 system level functional requirements for the selected concept, and suggest methods to verify the requirements. Describe the verification methods in sufficient detail. Provide traceability between stakeholder and system requirements.
- e) Prepare a risk matrix that summarizes the pros and cons of your proposed solution and provides suggested mitigations for each risk.

exam info semesterguide 3  
exam info semesterguide 4  
exam info semesterguide 5

50%

Type of grading (I,D,G)

D or G, I

Scale of grading

1-10

Norm

≥5.5

Distribution

examinations 50% / 50%

type of exam A

type of exam B

weight of exam A

weight of exam B

design of assessment of exam A

design of assessment of exam B

indicator 1

indicator 2

indicator 3

indicator 4

- indicator 5
- indicator 6
- indicator 7
- indicator 8
- indicator 9
- indicator 10
- indicator 11
- indicator 12

<b>9</b>	<b>Planning</b>	
week	subjects	Chapters to read/ study
subjects week 1	Model Based System Engineering Math Works Masterclasscourse: Simulink Projects and System Ccomposer and Projects	tbd
subjects week 2	Model Based System Engineering Math Works Masterclasscourse: Simulink Projects and System Ccomposer and Projects	tbd
subjects week 3	Course information, Introduction to System Engineering communication, User / client requirements	Stakeholders needs and tbd
subjects week 4	System specifications (including validation) Concept generation (exploration) and decision making (Puch matrix?)	tbd
subjects week 5	System specifications (including validation) Concept generation (exploration) and decision making (Puch matrix?)	tbd
subjects week 6	Risk analysis / management	tbd
subjects week 7	Architecture, decomposition and interfaces	tbd
subjects week 8	Architecture, decomposition and interfaces	tbd
subjects week 9	Safety	tbd
subjects week 10	Error budgetting	tbd
subjects week 11	Error budgetting	tbd
subjects week 12	Test, validation and verification	tbd
subjects week 13	manufacturing and realisation	tbd
subjects week 14	Questions and repetition if needed	
subjects week 15	finalize assignment	
subjects week 16	finalize assignment	
subjects week 17		

subjects week 18	<a href="#">Assessment case assignment</a>	
subjects week 19	<a href="#">Repair assignment</a>	
subjects week 20	<a href="#">Assessment case assignment (resit)</a>	

<b>10</b>	Difference with the bachelor
Difference with bachelor level (if applicable)	<a href="#">Higher complexity of tasks, higher level of independency mastering the material and also more material is covered</a>
<b>11</b>	<b>Connection with system design</b>
connection to SDA	<a href="#">Ths module is about system design</a>
<b>12</b>	<b>Miscellaneous information</b>
Lead developper	<a href="#">Paul Goede</a>
CO-developpers	<a href="#">Jeedella S.Y. Jedella</a>
Possible teachers	<a href="#">Jeedella S.Y.Jedella / Paul Goede</a>

- learning outcome type 1     understand, apply
- learning outcome type 2     analyse, evaluate, create
- learning outcome type 3     analyse, evaluate, create
- learning outcome type 4     understand, apply
- learning outcome type 5     understand, apply
- learning outcome type 6     analyse, evaluate, create
- learning outcome type 7
- learning outcome type 8
- learning outcome type 9
- learning outcome type 10
- learning outcome type 11
- learning outcome type 12

learning outcome weight 1	0-30
learning outcome weight 2	0-30
learning outcome weight 3	0-30
learning outcome weight 4	0-30
learning outcome weight 5	0-30
learning outcome weight 6	0-30
learning outcome weight 7	
learning outcome weight 8	
learning outcome weight 9	
learning outcome weight 10	
learning outcome weight 11	
learning outcome weight 12	
planning reading week 1	tbd
planning reading week 2	tbd
planning reading week 3	tbd
planning reading week 4	tbd
planning reading week 5	tbd
planning reading week 6	tbd
planning reading week 7	tbd
planning reading week 8	tbd
planning reading week 9	tbd
planning reading week 10	tbd
planning reading week 11	tbd
planning reading week 12	tbd
planning reading week 13	tbd
planning reading week 14	
planning reading week 15	
planning reading week 16	
planning reading week 17	
planning reading week 18	
planning reading week 19	
planning reading week 20	



Overview of all learning outcomes MDTE

Units of Study	Learning outcomes	Supportive courses	Study Load in hours (SBU)
<b>Year 1</b>	Digital Technologies - year 1	<ul style="list-style-type: none"> <li>• Data retrieval, basic processing and data visualization</li> <li>• AI: hands-on machine learning and neural networks</li> <li>• Deep dive into data analysis: mastering the state-of-the-art</li> </ul>	560
	Practice-based research – year 1	<ul style="list-style-type: none"> <li>• Practice-based research - basic skills</li> <li>• Collecting &amp; analyzing data</li> <li>• Communicating research results</li> </ul>	336
	Systems Engineering – year 1	<ul style="list-style-type: none"> <li>• Understanding perspectives in systems engineering</li> <li>• Designing a value proposition</li> <li>• Optimizing and improving product design in an organizational context</li> </ul>	336
	Design Based Working – year 1	<ul style="list-style-type: none"> <li>• Create and make choices</li> <li>• Design thinking</li> <li>• Human centered approaches</li> </ul>	280
	Personal and professional identity – year 1	<ul style="list-style-type: none"> <li>• Coaching line</li> </ul>	168
<b>Year 2</b>	Integrated learning outcome 'Sensing a local problem'	<ul style="list-style-type: none"> <li>• Smart devices - sensing &amp; embedded software</li> <li>• Developing solutions: how to make a product successful</li> <li>• The bigger picture</li> <li>• Visualizing your process</li> </ul>	420
	Integrated learning outcome 'Preliminary research'	<ul style="list-style-type: none"> <li>• Instructions &amp; supervision</li> </ul>	224
	Digital technologies – graduation level	<ul style="list-style-type: none"> <li>• Supervision</li> </ul>	308
	Practice-based research – graduation level	<ul style="list-style-type: none"> <li>• Supervision</li> </ul>	224
	Systems Engineering – graduation level	<ul style="list-style-type: none"> <li>• Supervision</li> </ul>	224
	Design Based Working – graduation level	<ul style="list-style-type: none"> <li>• Supervision</li> </ul>	168
	Personal and professional identity – graduation level	<ul style="list-style-type: none"> <li>• Coaching line</li> </ul>	112

## Enrolment process exams

Exam registration in the academic year 2022-2023, Fontys University of Applied Sciences, School of Engineering Registration for regular and resit examinations

- Full-time and part-time students must register for the regular and resit examinations
- Registration for the examinations is done via the Progress portal (see the manual on the portal).
- The deadline for registration (end of course week 5) for the different examination periods is included in the annual calendar of Fontys University of Applied Sciences Engineering.
- Students who did not register during the registration period, but still wish to participate, can still be registered up to two working days before the examination, by paying a €10 fee per exam (with a maximum of €50 per examination period). Example: if the exam is on Friday, the student can register no later than Tuesday. In order to participate, students must report to the administration office.
- The deadline for registration for resits during the course weeks will be separately announced by the student administration office.
- Payment must be made at the student administration office by debit card.
- Participating in an examination without being registered (via the Progress portal or after the registration period subject to payment) is not possible.
- Students who have not acted in accordance with the registration procedure described above cannot take part in the examination.

## Registration procedure for educational activities

### Application procedure for educational activities academic year 2022-2023 Fontys University of Applied Sciences Engineering

- Full-time and part-time students can register to take part in an educational activity.
- Registration for these educational activities is done via Progress Portal (see the manual on the portal for the registration of educational activities).
- The deadline for registering educational activities is mentioned in Progress Portal.