

**Education and Examination Regulations 2024-2025 for the Master of Science programme *Health and Digital Transformation* of the Faculty of Health, Medicine and Life Sciences, Maastricht University, in accordance with Article 7.13 of the Dutch Higher Education and Scientific Research Act (*Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek, WHW*)**

These regulations have been adopted by the Dean of the Faculty of Health, Medicine and Life Sciences after advice of or consent from the Educational Programme Committee (*Opleidingscommissie*) and after consent from or in consultation with the Faculty Council (*Faculteitsraad*) on 11 June 2024.

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## SECTION 1 GENERAL PROVISIONS

### Article 1.1 Applicability of the regulations

1. These regulations apply to the education, exams and the examinations of the Master of Science programme Health and Digital Transformation, hereafter referred to as 'the programme'. The programme is provided by the Faculty of Health, Medicine and Life Sciences of Maastricht University, hereafter referred to as 'the faculty'.
2. These regulations apply to all students who participate in the programme in the academic year 2024-2025 and replace, if applicable, all other former regulations.
3. The replacement of the former regulations by these new ones may not disadvantage students that started the programme when former regulations were applicable. In cases where the new regulations disadvantage students, the old regulations are applicable.
4. These regulations also apply to students from other programmes, faculties or institutions of higher education, insofar as they follow components of the programme to which these EER apply.
5. For components of the programme that students follow at another degree programme, faculty or institution of higher education, the EER for the other programme, faculty or institution apply to the component in question.

### Article 1.2 Definitions

In these regulations, the following terms and definitions apply:

- a. the Act: the Dutch Higher Education and Scientific Research Act (*Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek*);
- b. student: a person who is registered at the university for education and/or to take exams and the examination of the programme;
- c. course: a study unit of the programme within the meaning of the Act;
- d. module: an educational component of the programme, such as a course, group meeting, practical training or written paper with the exclusion of the thesis;
- e) module overarching project; a module overarching assignment on an authentic case within a care organisation, company or research institute;
- f) portfolio; a platform, in which students formulate competency related learning goals and describe and analyze the progress on these learning goals, within the context of the module overarching project project and/or activities related to the project or modules;
- g. academic year: the period from 1 September of a calendar year up to and including 31 August of the following calendar year;
- h. programme: the master's programme referred to in Article 1.1 of these regulations, consisting of a coherent whole of study courses;
- i. specialisations, if applicable: any one of the feasible sub-programmes available in a master programme;
- j. exam: a component of the examination as referred to in Article 7.10 of the Act;
- k. educational components/activities: training as referred to in Article 7.13(2)(d) of the Act, in one of the following forms:
  - Participating in the module-overarching project;
  - Making a portfolio
  - Making an Exam
  - Writing a project report

- writing a paper or performing another written assignment;
- performing a research assignment;
- participating in field work or a field trip;
- participating in an activity intended to develop certain skills;
- participating in tutorials, lectures, project groups and study groups, work lectures, study team meetings;
- completing a placement;
- writing a master's thesis.

l. placement: a period in which a student performs their research, at Maastricht University or another institution;

m. thesis: a written report, reflecting the work accomplished during a placement period;

n. registration: the administrative recording of the passing results of an exam;

o. examination: the final examination of the master's programme;

p. credit: a unit expressed in ECTS credits, with one credit equalling 28 hours of study;

q. board of examiners: the board of the programme referred to in Article 7.12 of the Act;

r. board of admission: the board responsible for judging the admissibility of the candidate to one of the master's programmes;

s. examiner: the person designated by the board of examiners to administer exams and to determine the results of such exams;

t. course coordinator: an examiner who is responsible for the content of the education for a particular course;

u. faculty board: the faculty board referred to in Article 9.12 of the Act;

v. Rules and Regulations: additional rules associated with the Education and Examination Rules;

w. UM: Maastricht University;

x. course catalogue: the programme guide which includes further details about programme-specific provisions and information, which is provided via the digital learning environment.

The other terms have the meaning given to them by the Act.

y. Disability Support (DS): the central point at UM where students with a disability and/or chronic illness can apply for facilities or support.

## **SECTION 2 ADMISSION**

### **Article 2.1 Responsibilities**

The Dean of the Faculty of Health, Medicine and Life Sciences has given the responsibilities of the admission to the board of admission to oversee the applications for the master's programme. The board of admission will make the final decisions of those applicants who will gain admittance into a master's programme, based upon the admission requirements.

### **Article 2.2 Admission requirements**

1. The admission requirements for the master's programme depend on the prior education. Applicants awarded a relevant bachelor's or master's degree from a university are qualified for admission to the master's programme. The Board of Admission decides whether the candidate is qualified for admission or additional requirements apply. Full information about relevant programmes and additional

requirements is published on the website of the master's programme.

2. The admission requirements for the master's programme depend on the prior education. Applicants awarded a relevant bachelor's degree from a university of applied sciences (HBO in Dutch) and who have sufficient academic skills are qualified for admission to the master's programme. The Board of Admission decides whether the candidate is qualified for admission or additional requirements apply. Full information about relevant programmes and additional requirements is published on the website of the master's programme.

3. In addition to the above (paragraphs 1 and 2) applicants who have demonstrated proficiency in the English language, either automatically or by showing language tests certificates (see the UM website) are qualified for admission to the master's programme.

4. For this master's programme the UM application deadlines apply. These deadlines are published on the UM website.

### **Article 2.3 Language requirements with non-Dutch diplomas**

1. Holders of a non-Dutch diploma can only register if they have met the minimum English language requirement corresponding to IELTS (international English Language Testing System) with a score of at least 6.5.

2. The requirement referred to under (a) is met if the person concerned has obtained one of the following diplomas or certificates:

- a completed bachelor's or master's study programme where the language of instruction is English;
- an International or European Baccalaureate, a US high school diploma or UK GCE A-levels, or
- Can demonstrate sufficient proficiency in English, for example through English taught courses, internships or work experience in an English environment, or
- can submit one of the following language test certificates, with a minimum score of at least:
  - IELTS: 6.5
  - TOEFL iBT: 90
  - TOEFL iBT Special Home Edition Test: 90
  - TOEIC listening and reading: 720; speaking and writing: 310
  - Cambridge Advanced C1: Grade C (scale 180-184); First: Grade A (scale 180-184); First B2: Grade B (scale 176-179)
  - TOEFL Paper-delivered Test: Reading: 20-30; Listening: 20-30; Writing: 20-30

## **SECTION 3 CONTENT AND STRUCTURE OF THE PROGRAMME**

### **Article 3.1 Aim of the programme**

1. The study programme is intended to:

- provide academic education as set out in the educational concept and profile of Maastricht University;
- provide a broad-based learning experience within the scientific field of the programme;
- prepare the student for a professional career in the field of Healthcare and Digital Transformation (see also Appendix 1).

2. The programme contains sufficient elements for the academic and intellectual development of students, above all:

- independent scientific thinking and performance;
- scientific communication;
- handling professional knowledge and skills in a social setting.

3. The programme's educational activities are based on core values and norms laid down in the Maastricht University Rules of Conduct and the principles of research integrity and the ensuing guidelines for good research practices as laid down in the Netherlands Code of Conduct for Research Integrity (see UM website).

### **Article 3.2 Form of the programme**

1. The programme is offered on a full-time (one year) and part-time basis (two years).
2. The programme commences once a year in September.

### **Article 3.3 Language of instruction**

1. Throughout the programme and in all exams the English language will be the standard.
2. It is not allowed to use dictionaries during the exams.

### **Article 3.4 Communications and announcement of decisions**

1. The faculty board, the board of examiners and the examiners may use the digital learning environment, e-mail through the UM account and the (faculty) website for communications relating to the programme and examinations.
2. The faculty board, the board of examiners and the examiners may use the digital learning environment, e-mail through the UM account and the (faculty) website to announce decisions.
3. The student must regularly check their university e-mail address, the Faculty website and the digital learning environment. Information disseminated via e-mail, the digital learning environment or the website will be assumed to be known.

### **Article 3.5 Study Load**

The programme has a study load of 60 ECTS.

### **Article 3.6 Content, structure and ECTS of the programme**

The content, structure and ECTS of the programme are described in Appendix 2. This appendix forms part of these regulations.

### **Article 3.7 Flexible programme and flexible masters**

1. A student registered for one of the faculty's programmes may, under certain conditions, formulate an educational programme of his or her own choice, which is different from the educational programme stated in Appendix 2. The composition of such a programme must be approved beforehand by the board of examiners.

2. The flexible programme must have a study load of 60 credits.
3. The board of examiners will decide whether to grant permission for the student's proposal within four weeks after it receives the proposal.
4. In granting the permission, the board of examiners will indicate which programme offered by the faculty will include the programme formulated by the student for purposes of the Education and Examination Regulations.

#### **Article 3.8 Examination**

1. The components of the master's programme are listed in Appendix 2.

A registration for completion for each component of the programme must be obtained:

- the exams, including active participation in the mandatory activities;
- the portfolio
- the project report of the module overarching project
- completing a placement and writing a master's thesis.

2. The board of examiners, with due regard to the Education and Examination Regulations, lays down guidelines pertaining to the norms for and assessment of examinations for each of the courses referred to in Paragraph 1. These guidelines are incorporated in the Rules and Regulations.

### **SECTION 4 EDUCATION**

#### **Article 4.1 Programme components; composition; actual design**

1. For the programme components, courses and longitudinal tracks/ projects are provided with a study load stated in Appendix 2.
2. The education is in principle given in the form of tutorial group meetings, study groups, practical training, lectures, individual and group supervision on the module overarching interdisciplinary project or otherwise.
3. The educational programme includes 40 weeks per year.

#### **Article 4.2 Attendance and best-efforts obligation**

1. Each student is expected to actively participate in the educational activities they are attending.
2. In addition to the general requirement that the student actively participates in the course, the student must participate in at least 75% of the educational activities (with the exclusion of the lectures) unless there are different requirements defined in the course assessment plan.
3. If the student has participated in less than 75% of the activities the course coordinator may give additional assignments to the student.

### **SECTION 5 ASSESSMENT**

### **Article 5.1 General**

1. During a programme component, the student will be tested for academic and intellectual development and the extent to which the student has sufficiently achieved the stated learning objectives/ learning outcomes.
2. The assessment plan describes the form of the exams, the achievements the students must make to pass the programme component/ module and the criteria on which the student is assessed. The assessment plan is published in the digital learning environment.
3. The Rules of Procedure at Exams describe the assessment procedure. These rules are published on the FHML student intranet.

### **Article 5.2 Grades**

1. Grades are awarded on a scale of 1 to 10.
2. The final grade for a course or a part of an exam (excluding the thesis) will be rounded to one decimal place and is sufficient if the final grade is '5.5' or higher.
3. The final grade for the thesis will be rounded to one decimal place and is sufficient if the grade is a 6.0 or higher.
4. When a component of the examination is graded with a qualification, the student has to obtain at least a 'Pass' for this component.
5. The way grades are rounded off is determined in the Rules and Regulations.

### **Article 5.3 Order of exams**

1. Students are not admitted to a course exam unless they have fulfilled the obligation to attend mandatory educational activities for the relevant course. In appropriate cases, a student may be conditionally admitted to an exam at their request, pending a final decision on admissibility from the board of examiners.
2. A student will be permitted to start with a placement if they have achieved at least 12 ECTS for the preceding master's courses and have submitted a concept research proposal.
3. Permission to start writing the thesis is only obtained under the condition that the student has received a passing grade for the research proposal.

### **Article 5.4 Scheduling and frequency of the exams**

1. Students can take exams twice a year on dates determined by the faculty board: once during or at the end of the course period (first sit for the exam) and once during the academic year (resit option).
2. In exceptional cases, the board of examiners can decide that an exam may be taken at another time than determined in accordance with paragraph 1 of this Article but in any case during the same academic year.

### **Article 5.5 Form of the exams**

1. In principle, there are written exams. 'Written exams' also include computer-based exams. The examiner may decide that, because the number of students is small or because of the nature and content of a course, an exam will be oral or will include one or more written essays, which may or may

not have to be explained orally. The examiner will announce any such decision no later than two weeks before the scheduled exam date.

2. Practical tests may include skills, participation, attitude and professional behaviour. The format and judgement criteria of practical tests will be announced in the (electronic) course book and/or during the introduction to the course.

3. The board of examiners reserves the right to allow other forms of examination, including testing of group work and portfolio. The structure and judgement criteria of the exams will be announced in the digital learning environment.

4. Upon request, students with a disability and/or chronic illness are offered the opportunity to take exams and assessments or teaching and learning activities in a manner adapted as optimal as possible to their disability and/or chronic illness. These adjustments shall be reasonably tailored to the student's disability and/or chronic illness but may not alter the quality or difficulty of an educational component or assessment programme. All intended learning outcomes must be covered by the adapted (assessment) provision. Based on the advice of Disability Support (DS) and any additional information, if requested, the Board of Examiners decides on adaptations in assessment. If the Board of Examiners deviates from the advice of DS, this deviation is motivated.

#### **Article 5.6 Oral exams**

1. Oral exams are taken only by one student at a time, unless the board of examiners decides otherwise.

2. An oral exam is given by the examiner in the presence of a second examiner, unless the board of examiners has decided otherwise.

3. Oral exams take place in public, unless the board of examiners or the relevant examiner decides otherwise in a special case or if the student objects to this.

4. Contrary to what is described in paragraph 3 an oral exam will not take place in public when this oral exam is a regular part of the assessment of the course.

#### **Article 5.7 Placement and Thesis**

1. The programme management lays down, after consultation with the board of examiners, the requirements with regards to the nature and content of the placement in separate rules. These rules are published on the FHML student intranet and are considered to be part of the Rules and Regulations.

2. A placement coordinator is assigned to the master. The placement coordinator is responsible for granting a proposal admissible.

3. The Board of Examiners appoints an examiner as faculty supervisor/1st examiner for the placement and thesis and a second examiner for the thesis. The faculty supervisor/1st examiner has expertise on the thesis topic.

4. The placement coordinator supports the appointment of the faculty supervisor/1st examiner for the placement and thesis and the 2nd examiner of the thesis.

5. Students may undertake a placement supervised by the faculty only once during the master's programme, except when they fail the placement and thesis.

6. The thesis must be written individually.

#### **Article 5.8 Determination and announcement of exam results**

1. The board of examiners determines the standards for assessing each examination component. The standards are included in the Rules and Regulations.
2. The examiner determines the result of a written exam and provides the Education Office with the necessary information to apprise the student of the result within 15 working days of the date on which it was taken.
3. The examiner determines the result of an oral exam within one working day after it is taken. If more than one student takes the same exam after each other, this period may be extended by up to five working days.
4. When the result of a written exam is announced, it will be indicated how the student can inspect the exam and file an appeal as referred to in Article 6.4.

#### **Article 5.9 Right of inspection**

1. Within 10 working days of the date on which the result of a written exam, including a computer-based exam, is announced, students may, upon request, inspect their evaluated work.
2. Together with or before the announcement of the result of a written exam, it is stated how students can inspect their reviewed test.
3. Contrary to what is described in paragraph 1 the term of 10 working days can be extended in particular circumstances (vacation or public holidays). In this case, the teacher must announce in time when students can expect their results and when students can inspect their work.

#### **Article 5.10 Registration of educational components**

A registration for completion of an educational component, and therefore the related credits, is obtained once all requirements with regard to the components of the course have been met.

These requirements include:

- *where applicable*: active participation in the group meetings;
- *where applicable*: participation in the practical exercises, including oral and/or written reports;
- *where applicable*: satisfactory completion of papers;
- a final course grade of 5.5 or higher.

#### **Article 5.11 Period of validity**

1. Exams which have been passed are valid for an unlimited period.  
Contrary to the above, the board of examiners may require the student to take an additional or replacement exam or exam component for an exam which was passed more than six years ago if the student's knowledge or insight that was examined is demonstrably outdated or the skills that were examined are demonstrably outdated.
2. If exceptional circumstances apply as referred to in Article 7.51 paragraph two of the Act, the period of six years in paragraph 1 will be extended by the duration of the financial support the student receives from the profiling fund.

**Article 5.12 Invalidation of exams**

If an exam involves irregularities that make it impossible to accurately assess the candidate's knowledge, insight and skills, the board of examiners may declare the exam invalid for both the examinee and a group of examinees.

**Article 5.13 Retention period for tests**

1. The exercises, answers and the evaluated work of the written exams will be retained in paper or digital form for two years after the exam/examination result is determined.
2. The final theses and the evaluation of theses will be kept for at least seven years after the evaluation.
3. The procedure concerning to the archiving of exams is published in Canvas.

**Article 5.14 Exemption**

1. The board of examiners may, at a student's request, grant the student an exemption from taking a course including one or more exams if they demonstrate in writing to the board of examiners' satisfaction that they previously:
  - either passed an exam for a university programme which was similar in terms of content and level or
  - gained sufficient knowledge and skills relevant to the exam concerned, either through work or professional experience.
2. An exemption may only pertain to an entire course and not a component thereof.
3. At most 20% of the credits for the programme may be earned based on the exemptions granted.
4. The master's thesis is excluded from this exemption option.
5. In order to qualify for an exemption, a student has to submit a written request to the board of examiners within a minimum of 6 weeks prior to the start of the relevant course.
6. The board of examiners will not grant any exemption based on exams passed by a student outside the programme during the period in which the student was barred by the board of examiners from taking exams for the programme because of fraud.

**Article 5.15 Fraud**

1. 'Fraud', including 'plagiarism', means actions or omissions by a student which make it impossible in whole or in part to properly evaluate their knowledge, understanding and skills.
2. 'Plagiarism' means the presentation of ideas or words from one's own or someone else's sources without proper acknowledgment of the sources.
3. If the board of examiners determines that a student has engaged in fraud with respect to an exam or exam component, the board of examiners can take appropriate measures.
4. In serious cases of fraud, the board of examiners can propose to UM's Executive Board that the student(s) concerned be permanently deregistered from the programme.
5. The General FHML/UM-Regulations for Fraud and Irregularities and the FHML student guidelines for the use of generative AI specify what constitutes fraud and which sanctions the board of examiners can apply.

#### **Article 5.16 Unsuitability (*Iudicium Abeundi*)**

1. In exceptional circumstances and after carefully weighing the interests at stake, the board of examiners may, stating reasons, ask the dean to request that the Executive Board terminate or deny a student's registration for a programme if, through their conduct or statements, the student shows that they are unsuitable to practice one or more professions for which the programme is training the student or is unsuitable for the practical preparation for the profession.
2. If the faculty dean is asked by the Executive Board for a recommendation on a proposed termination or denial of registration based on the reasons stated in paragraph 1, the dean will in turn ask for a recommendation from the board of examiners. The recommendation to the dean will be supported by reasons.

### **SECTION 6 EXAMINATION**

#### **Article 6.1 Examination**

1. The board of examiners determines the result and date of the examination and issues the certificate as referred to in Article 6.3 as soon as the student has satisfied the requirements for the examination programme.
2. Prior to determining the result of the examination, the board of examiners may conduct their own investigation of the student's knowledge regarding one or more components or aspects of the programme if and insofar as the results of the relevant tests give reason to do this.
3. To pass the examination, the student must pass all components as mentioned in Appendix 2.
4. To pass the examination and receive the certificate, the student must also have been registered for the programme during the period that the exams were taken.
5. A certificate may only be issued after it has been shown that the student has satisfied all the obligations, including paying the tuition fees.
6. The last day of the month in which the student satisfied all the examination obligations will be considered the examination date (graduation date).
7. Students who have passed the examination and who are entitled to the issuance of a certificate may, stating reasons, ask the board of examiners not to do this yet.  
This request must be submitted at least one month before the final assignment is turned in or the final exam is taken.

The board of examiners in any event grants the request:

- if the student is selected by the faculty for a double degree, an extracurricular placement or an extracurricular exchange, or
- if the student has held/will hold a board position for which a financial support from the 'Profileringsfonds' will be granted for at least nine months, or a Student Introduction Committee ('INKOM') board position.

The board of examiners may also grant the request if refusal would result in an exceptional case of extreme unfairness because of the fact that the student concerned could not have taken the automatic graduation into account when they were planning their study.

### **Article 6.2 Degree**

Students who have passed the examination will be awarded the degree 'Master of Science'.

### **Article 6.3 Certificate and statements**

1. As proof that the examination was passed, the board of examiners issues a certificate, after it has been stated by or on behalf of UM's Executive Board that the procedural requirements for receiving the certificate have been met. The certificate is based on the model that UM's Executive Board has adopted. One certificate will be issued per programme, even if the student completes several specialisations or tracks.
2. The certificate that the examination has been passed also indicates:
  - a. the name of the institution;
  - b. the name of the programme;
  - c. the examination components;
  - d. the degree awarded;
  - e. the date on which the programme was most recently accredited or was subjected to the new programme test;
3. Students who are entitled to the issuance of a certificate may, stating reasons, ask the board of examiners not to do this yet (pursuant to Article 6.1 sub 7).
4. The certificate is signed by the chair of the board of examiners or an appointed substitute and the faculty dean or an appointed substitute.
5. The certificate is awarded in public, unless the board of examiners decides otherwise in exceptional cases.
6. The certificate includes a list of the examination components.
7. The board of examiners includes a diploma supplement as referred to in Article 7.11(4) of the Act with the certificate. This diploma supplement is based on the model adopted by UM's Executive Board, which is in compliance with the agreed European standard format.
8. The board of examiners may award the '*cum laude*' designation in accordance with the provisions in the Rules and Regulations.
9. A student who has passed at least one exam and who cannot be issued a certificate will upon request, receive a statement issued by the board of examiners which indicates the exam(s) which they passed.

### **Article 6.4 Right of appeal**

Within six weeks after the decision by the examiner and the board of examiners is announced, the student may appeal this decision to UM's Complaint Service Point.

The appeal must be signed, must include a date and the name and address of the party lodging the appeal, must indicate the grounds for the appeal and, if possible, must include a copy of the decision being appealed.

## **SECTION 7 STUDY GUIDANCE**

**Article 7.1 Study progress administration**

The faculty records the students' individual study results and makes them available for the student through the digital learning environment.

**Article 7.2 Study guidance**

The faculty will provide for the introduction and study guidance for students registered for the programme.

**SECTION 8 TRANSITIONAL AND FINAL PROVISIONS**

**Article 8.1 Amendments**

1. Amendments to these regulations may be adopted in a separate decision by the faculty board, after a recommendation from the programme committee and after consent from or consultation with the faculty council.
2. An amendment in these regulations will not pertain to the current academic year, unless the interests of the students will not reasonably be harmed as a result.
3. In addition, amendments may not affect, to the students' detriment, a decision regarding a student which has been taken by the board of examiners pursuant to these regulations.

**Article 8.2 Notice**

The faculty board ensures that proper notice is given of these regulations, the rules and regulations adopted by the board of examiners, and any changes to these documents, by, for example, placing such notice on the faculty website and in the digital learning environment.

**Article 8.3 Evaluation**

The Faculty Board will ensure that the education of the programme is regularly evaluated, assessing at least – for the purpose of monitoring and if necessary adapting the student workload – the amount of time students need to complete their duties as set out therein.

**Article 8.4 Unforeseen cases/safety net scheme**

1. In cases not covered or not clearly covered by these regulations, decisions are taken by or on behalf of the faculty board, after it has consulted with the board of examiners.
2. In individual cases in which application of the Education and Examination Regulations would lead to manifestly unreasonable results, the board of examiners can deviate from the stated regulations in the student's favour.

**Article 8.5 Effective date**

This Regulation will come into force on the 1<sup>st</sup> of September 2024 and will apply to the academic year 2024-2025.

**Appendix 1: Competencies (1.1) and intended learning outcomes (1.2) of the programme *Health and Digital Transformation***

**1.1 Competencies**

The master HDT is a competence-based educational programme. Competence-based curricula are typically organised around desired, predefined outcomes or abilities that all students need to demonstrate upon graduation. In designing the programme, ‘backward-chaining’ strategies were used in which clearly defined educational outcomes and abilities define all teaching and learning activities as well as assessment activities that foster students’ competence development through supporting synthesis of knowledge, skills, judgment, professional values and norms. A strategy referred to as constructive alignment (Biggs, J., & Tang, C. (2007)). Constructive alignment is set up by first defining the intended learning outcomes or competencies on the programme level, then setting the intended learning outcomes of individual modules, projects and the master thesis and finally developing teaching and assessment towards fulfilment of the intended learning outcomes in a measurable manner. To achieve the aim of the master and inspired by the conceptual model four competencies are defined: a HDT graduate must be an expert, an investigator, a communicator and a professional, see table 1.

*Table 1: Health and Digital Transformation competencies*

Expert	The Expert demonstrates and effectively applies in-depth knowledge and skills in the domains of data science, information technology and organizational science (social systems engineering) with healthcare as its field of application. The expert is therefore a true bridge-builder, able to think, act and intervene interdisciplinary in these domains where necessary and plays a role in communication and cooperation between disciplines, between stakeholders and between the workplace and management;
Investigator	The Investigator is curious and inquisitive, shows willingness and curiosity to explore and find answers, and has developed critical thinking as well as basic research and problem solving skills; is willing to disseminate knowledge and understands how scientific knowledge is obtained and how it evolves. This includes designing, implementing and evaluating digital technology and AI in the broad field of healthcare, taking into account different interests of stakeholders and ethical, legal and intercultural and international differences;
Communicator	The Communicator establishes and maintains effective relationships with stakeholders in their field of expertise and is competent in the relevant forms of communication including intercultural communication. As a bridge-builder, he/she is able to arrive at decision-making regarding optimal health care by generating and maintaining collegial and interdisciplinary partnerships in an effective manner;
Professional	The Professional has a professional attitude to their work and in their relations to others, is organised, and can organise their work and research and continued learning throughout the life course. The Professional works according to the highest applicable professional and ethical standards within the applicable legal framework and makes constant efforts to fully control these standards. The Professional is able to find and maintain employment at their level of qualification in a globalising labour market.

## 1.2 Intended learning outcomes

Following the constructive alignment principles for designing the programme, and applying the conceptual model for content inspiration, fourteen intended learning outcomes (ILOs) on programme level are defined. Per competency, the ILOs are defined as follows.

### *Competency 1: Expert*

ILOE1	Has a profound knowledge and understanding of the theories, frameworks and dimensions related to health(care) and to technology and data science and can readily apply this in the correct context as a bridge-builder between these fields.
ILOE2	Is proficient in bridging the gap and connecting the domain of healthcare on the one hand with the domain of digital technology and data science on the other hand in order to improve health and access to healthcare for patients on a national and international level.
ILOE3	Has a thorough understanding of and takes into account ethical, privacy, legal and societal considerations when bridging the gap between health(care) and digital technology and is aware of possible international and intercultural differences regarding these issues.

### *Competency 2: Investigator*

ILOI4	Has a profound understanding of academic research, including the benefits and limitations of the multiple methodologies and designs, and independently conducts advanced qualitative and quantitative scientific research.
ILOI5	Assesses and reflects with a critical mindset on developments, decision-making and scientific contributions that take place within the field of study including its relation to other fields.
ILOI6	Explores, considers and weighs critically the different interests of stakeholders, ethical and legal issues, possible limitations/barriers and the available solutions to determine and decide on the best course of action to bridge the gap, improve health and access to health, and advance the field.

### *Competency 3: Communicator*

ILOC7	Plays 'as a bridge builder', a role in communication and cooperation between the domains of health, data science, information technology and organizational science (social systems engineering) and between healthcare professionals, patients and clients and between the workplace and management.
ILOC8	Possesses excellent communication skills in spoken and written language allowing for communication, including interdisciplinary and intercultural communication, with fellow experts, stakeholders, laymen and other third parties about elements of, developments within and research concerning the field of study.
ILOC9	Establishes effective relationships and networks, including interdisciplinary and intercultural relationships and networks, with data scientists, healthcare professionals, IT experts, lawyers, managers, administrators, patients and other parties and is able to tailor the form of communication to the receiver.
ILOC10	Is able to take decisions in an effective manner in collegial, interdisciplinary and intercultural partnerships and networks and is able to show leadership in this.
ILOC11	Respects and accounts for social and cultural diversity in written and oral communication.

### *Competency 4: Professional*

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ILOP12	Is aware of personal learning objectives, strengths, weaknesses, values and beliefs, and biases, including the ability to reflect on these and adapt them where necessary.
ILOP13	Integrates an attitude of life-long learning and knows how to act upon this, meaning knowing what is required and where this can be learned.
ILOP14	Uses the acquired skills in the field of health and digital transformation throughout the professional life.

**Appendix 2: The content and 60 ECTS of the programme *Health and Digital Transformation***

In most programme components/modules and the module-overarching (longitudinal) Project, also, practical training is scheduled and skills are trained. These training and skills are part of the programme components/modules and longitudinal track/ project.

*Period 1*

Module 1:

Data and technology in healthcare (3 ECTS)

Module 2:

The multimodality of a digital society (3 ECTS)

*Period 2*

Module 3:

Technical evaluation of AI algorithms (3 ECTS)

Module 4:

Making sense of digital technology in healthcare (3 ECTS)

*Period 3*

Module 5:

Research methods and thesis preparation (6 ECTS)

*Period 4*

Module 6:

Digital technology as a medical device (3 ECTS)

Module 7:

Digital strategies for disrupting healthcare system (3 ECTS)

Module-overarching (longitudinal) Project during period 1, 2 and 4:

Interdisciplinary project within learning communities of healthcare organisations and industry (18 ECTS)

*Periods 5 and 6*

Placement and thesis (18 ECTS)

### Appendix 3: Language of instruction

Both the title of the programme and the language of instruction of the HDT programme is English. The choice of language for the programme is in line with UMs Code of Conduct for Language<sup>1</sup> and the UM Language Policy<sup>2</sup>. In its Strategic Programme Community at the CORE 2017-2021<sup>3</sup>, UM describes as one of its goals to educate skilled knowledge workers who are able to hold key positions in a broad professional context on the Dutch and international labour market. To realise this ambition, UM offers its students a stimulating learning environment based on Problem-based Learning principles and within an international classroom setting. This setting encourages students to collaborate across the boundaries of disciplines and (national, ethnic, religious and cultural) backgrounds. This setting also contributes to the development of 21<sup>st</sup> century skills. People in the 21<sup>st</sup> century will have to learn how to creatively combine different areas (e.g. new technical actions, new social skills and intercultural competences).<sup>4</sup>

The labour market for HDT graduates is strongly internationally oriented. The labour market preference for English is supported by an analysis of vacancy texts in the Netherlands. The ROA made an analysis of vacancy texts on the Dutch vacancy website Indeed.nl.<sup>5</sup> A targeted search for positions that match the profile of the HDT programme was performed. Search terms included: consultant, engineer, scientist, advisor, medical start-up, clinical research, personalized/precision medicine, innovation manager health, PhD candidate, policy officer, product development, clinical project manager, organisational transformation, health data scientist and manager digitalisation. This yielded 35,809 hits. Subsequently, those vacancies were selected that were as similar as possible to the job titles of the above positions, are at masters level and do not require more than three years of work experience. In addition, duplicated vacancies or vacancies related to senior positions or vacancies, which clearly required a higher or lower level of education, were excluded. For the general search terms, a targeted search was conducted within the Software & Information Technology, Research & Science, Care & Welfare and Healthcare sectors in order to better guarantee relevance. A maximum of 10 relevant vacancies were selected per search query. This resulted in 104 relevant vacancies, which were analysed for language requirements of the position and the international character of the work environment. Of the 104 vacancies analysed in detail, 79 vacancies (76.0%) explicitly set requirements for English language skills. In addition, almost all vacancies are in English: 92 (88.5%) of 104 vacancies. Furthermore, the international working environment is emphasised in 48 vacancies (46.2%). In total, 99 vacancies (95.2%) were drafted in English, and/or required good English language skills and/or emphasise the international working environment.

The choice to offer the master's programme in the English language is therefore in line with preferences as expressed by the labour market. Representatives from the professional health domain endorse the choice of English for the master in the thirty support letters we received.<sup>6</sup> Organisations from the Limburg region (n=17) argue that the region is characterised by its location in a cross-border Euregion in

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<sup>1</sup> Gedragscode Voertaal van de Universiteit Maastricht. Vastgesteld door het College van Bestuur op 06.03.2018.

<sup>2</sup> Universiteit Maastricht Taalbeleid 2018-2021.

<sup>3</sup> Maastricht University. Community at the CORE: Strategisch Programma 2017–2021. Maastricht, 2016

<sup>4</sup> Open Universiteit. 21<sup>e</sup>-eeuwse vaardigheden: achtergronden en onderwijsimplicaties. Heerlen, 2017. Verkregen via [https://www.ou.nl/documents/40554/43122/Rapport\\_21e\\_eeuwse\\_vaardigheden\\_110517.pdf/1bfed1a7-db4f-9a67-be11-29445f38fc53](https://www.ou.nl/documents/40554/43122/Rapport_21e_eeuwse_vaardigheden_110517.pdf/1bfed1a7-db4f-9a67-be11-29445f38fc53)

<sup>5</sup> Researchcentrum voor Onderwijs en Arbeidsmarkt. (2021). Technical Report Macrodoelmatigheid master Health and Digital Transformation. Universiteit Maastricht.

<sup>6</sup> Thirty support letters from national and regional health organisations, active in the health domain, were received as part of the Macro efficiency request for the HDT programme.

which intensive cooperation takes place in the fields of labour market, education, economy and ICT. Command of the English language is necessary to be able to understand different parties well in order to make relevant connections. The representatives further stated that it is essential that graduates acquire the skills to communicate professionally in English in order to work in an international team.

Furthermore, the Limburg labour market is under pressure; there is a shortage of sufficiently qualified employees. Attracting national and international students and knowledge workers is stressed in the *Herziene Regionale Kennisagenda Limburg*<sup>7</sup> as one of the answers to regional labour market needs. The programme contributes to this by attracting (inter)national students who learn and work during the programme in an international environment, in close proximity to future employers. This makes it more attractive for graduates to settle in the region and to contribute to the regional labour market.

Finally, the domains of health and data science are international in nature and current professional and scientific literature is available almost exclusively in English, with scientific discussions about these subjects in the fields mainly in English. With an English-taught master programme, our students therefore also gain valuable experience from an academic perspective and our graduates will be well prepared for the English-language communication skills that are required in relevant positions. This will give them access to a larger part of the labour market.

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<sup>7</sup> Provincie Limburg. *Herziene Regionale Kennisagenda Limburg*. Maastricht: Provincie Limburg, 2018.