

***Programme-specific appendix to the programme  
section of the student charter including the  
education and examination regulations for the  
master of science programme of Health Sciences***

**(art. 7.13 and 7.59 WHW)**

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**Preamble**

1. The rules and regulations in this appendix apply to the full-time master of science programme of Health Sciences.
2. Together with the General Section (TNW17052/vdh), this appendix constitutes the programme part of the Student Charter including the education and examination regulations of the master of sciences programme of Health Sciences of the Faculty Science & Technology.
3. The rules and regulations established by the Board of Examiners of the master of science programme of Health Sciences regarding its duties and responsibilities according to article 7.12b WHW have been included in the 'Board of Examiners' Rules of the Health Sciences master's programme.

Kenmerk: TNW17056/wd/sk/gv/vdh  
Datum: 31 August 2017

## **Article 1      Definitions**

Terms used in this regulation and common to the law on Higher Education and Research act (WHW) are defined according to the law.

## **Article 2      Aims and attainments of the programme**

The health scientist of the University of Twente has a special focus on improving health care by making it more effective and efficient. He/she evaluates, designs and implements processes products and systems with a specific knowledge and expertise on the value of (health) technology.

The health scientist is also trained to have skills for independent critical judgement, including in the areas of ethics, standards and values. Building on the basic skills acquired in the Bachelor's phase, the health scientist will be able to independently expand his or her repertoire of effective and situationally appropriate communicative skills. Additionally, the health scientist will be capable of independent reflection and of augmenting his scientific knowledge and skills.

There are three specialisation tracks in the Master:

### **1.    Personalized Monitoring & Coaching**

This specialization focusses on how unobtrusive, user-friendly technologies can personalize healthcare. Students will also look at the context of working and living and the needs and demands of stakeholders, like patients and caregivers.

The specialization starts with a course on eHealth. The goal is to introduce concepts of user-friendly and persuasive technologies and to address the holistic development perspective: people-centred and value-driven. The second course deals with tele-monitoring; how technologies can be used to monitor people with chronic care conditions to personalize healthcare.

The third course integrates knowledge of the prior courses and focusses on the use of Big Data to personalize healthcare. Big Data are the key to more personalized healthcare. Pervasive technologies, like wearables and smart phones, pave the way for unobtrusive 24-hour monitoring, generating large-scale data sets about ourselves. You will learn to combine clinical data, environmental data, and real-time life-tracking data on, for instance, physical activities, eating and sleeping behaviour. You can use these data to tailor treatment and coach patients. This is why they are seen as the key to self-management.

Students will participate in ongoing research projects in healthcare and apply socio-technical methodologies to create novel concepts for personalized coaching.

After this course, students will have knowledge about eHealth and value-based eHealth development approaches aimed at personalizing healthcare. They will also be able to apply methods and models for monitoring (large-scale) data and designing persuasive coaching strategies.

### **2.    Optimization of healthcare processes**

In this specialization students will learn to apply methods of early health technology assessment in order to optimize processes in and across healthcare organizations. They will use Big Data analysis methods to identify key areas of improvement in the processes of healthcare delivery. The students will also apply health economic models and simulation to predict the value of innovations in improving these processes. The added value of process and technological innovations to healthcare organizations can be assessed in terms of health benefits, (inter)organizational efficiency, and more. Learning to appraise the financial viability of newly designed healthcare delivery processes, and know how to purchase and implement those innovations are also skills that will be addresses in this course.

### **3.    Public Health**

Keeping citizens' health situation up to level is a challenge that reaches beyond governments' responsibilities. It also reaches beyond citizens' responsibilities for healthy behaviour, healthy nutrition and sufficient exercise. Public health demands the careful interplay between public and private organizations. It is about the smart combination of medical care with other societal sectors, like education, (public) housing, transport and infrastructure, recreation and public parks, spatial planning and public safety.

In this specialization you learn how to develop cooperation, innovation and preventive actions among these sectors. These interventions aim at equal opportunities for all to live in good health. In this specialization you learn how to improve public health for instance:

- the design, implementation and evaluation of health programs;
- how to perform policy analysis and how to train (health) policy makers;
- how to disseminate health information in effective ways;
- how to set up community health centres and how to train its staff;
- how to facilitate processes of cooperation on design and development of health initiatives;
- management and implementation of health initiatives;
- the fine-tuning of health programs with other societal programs;
- performing independent health research and evaluations
- how to connect social and societal equality, health and welfare.

### Competence profile Health Sciences University of Twente

(based on academic criteria for bachelor and master curricula, Meijers 2003)

*A health scientist of the University of Twente has a focus on making the healthcare more effective and efficient. He/she does so by looking at processes and systems on the level of the patient and caretaker, healthcare organisation and on the level of the health care system. The processes and systems are analysed, (re)designed, implemented and evaluated. The health scientist possesses the ability to define the value of technology within the healthcare from a multi-disciplinary perspective and to advise relevant stakeholders.*

*These are the seven competences with their indicators.*

#### 1. Competent in Health Sciences

A health scientist is familiar with existing scientific knowledge, and has the competence to increase and develop this through study.	
Master	
1.1	Is able to apply the knowledge of the disciplines related to the organization, finances and performance of health care, into the health care challenges that will be addressed
1.2	Is able to integrate the knowledge of illness, health and behavior in to the health care challenges that will be addressed
1.3	Has the skill and the attitude to apply methods of truth-finding and the development of theories and models within the field of health sciences.
1.5	Is able to analyse, evaluate and create the value of technology within the health sciences.
1.6	Has the skill and the attitude to interpret texts, data, problems, results within the field of health sciences
1.7	Has the skill and the attitude to apply methods used for experiments, gathering of data and simulations within the field of health sciences
1.8	Has the skill and the attitude to apply the knowledge about decision making processes within the field of health sciences.
1.9	Is able to reflect on standard methods and their presuppositions; is able to question these; is able to propose adjustments, and to estimate their implications.
1.10	Is independently able to spot gaps in his / her own knowledge, and to revise and extend it through study.

#### 2. Competent in Research

<i>A health scientist has the competence to acquire new scientific knowledge through research. For this purpose, research means: the development of new knowledge and new insights in a purposeful and methodical way to improve the efficiency and effectiveness of health care</i>	
Master	
2.1	Is able to translate real life challenges within health care into research questions.
2.2	Is able to independently produce and execute a research plan.
2.3	Is able, and has the attitude to, where necessary, draw upon other disciplines in his or her own research
2.4	Is able to deal with the changeability of the research process through external circumstances or advancing insight. Is able to steer the process on the basis of this.
2.5	Is able to draw and substantiate conclusions based on research (data)
2.5	Is able to deal with the changeability of the research process through external circumstances or advancing insight. Is able to steer the process on the basis of this.

### 3. Competent in Designing

*As well as carrying out research, many health scientists will also design. Designing in this context is a synthetic activity aimed at the realisation of new or modified systems or processes, with the intention of creating value in accordance with predefined requirements and desires*

Master	
3.1	Has creativity and synthetic skills with respect to design problems
3.2	Is able to produce and execute (with supervision) a design plan.
3.3	Is able, and has the attitude, where necessary, to draw upon other disciplines in his or her own design.
3.4	Is able to formulate new research questions on the basis of a design problem.
3.5	Has the skill to take design decisions, and to justify and evaluate these in a systematic manner

### 4. A scientific approach

*A health scientist has a systematic approach characterised by the development and use of theories, methods and coherent interpretations, has a critical attitude, and has insight into the nature of science and technology.*

Master	
4.1	Is curious and able to identify and take in relevant developments
4.2	Is able to critically examine existing theories, models or interpretations in the area of his or her graduation subject
4.3	Has great skill in, and affinity with the use, development and validation of models; is able consciously to choose between modelling techniques
4.4	Has insight into the nature of science and technology within health sciences (purpose, methods, differences and similarities between scientific fields, nature of laws, theories, explanations, role of the experiment, objectivity etc.) and has knowledge of current debates about this
4.5	Has insight into the scientific practice (research system, relation with clients, publication system, importance of integrity etc.) and has knowledge of current debates about this.
4.6	Is able to document adequately the results of research and design in a publishable way, with a view to contributing to the development of knowledge in the field and beyond.

### 5. Basic Intellectual Skills

*A health scientist is competent in reasoning, reflecting, and forming a judgment. These are skills which are learned or sharpened in the context of the health sciences discipline, and which are generically applicable from then on.*

Master	
5.1	Is independently able to critically reflect on his or her own thinking, decision making, and acting and to adjust these on the basis of this reflection.
5.2	Is able to reason logically within the field and beyond; both 'why' and 'what-if' reasoning, and able to recognize fallacies.
5.3	Is able to recognise modes of reasoning (induction, deduction, analogy etc.) within the field and is able to apply these modes of reasoning
5.4	Is able to ask adequate questions, and has a critical yet constructive attitude towards analysing and solving real-life problems in the field of health sciences
5.6	Is able to form a well-reasoned opinion and debate with sound scientific arguments.

### 6. Competent in Cooperating and Communicating

*A health scientist has the competence of being able to work with and for others. This requires not only adequate interaction, a sense of responsibility, and leadership, but also good communication with colleagues and non-colleagues. He or she is also able to participate in a scientific or public debate.*

Master	
6.1	Is able to communicate in writing about research and solutions to problems with colleagues, non-colleagues and other involved parties in English
6.2	Is able to communicate verbally about research and solutions to problems with colleagues, non-colleagues and other involved parties in English
6.3	Is able to debate about both the field (health sciences) and the place of the field in society
6.4	Is characterised by professional behaviour. This includes: drive, reliability, commitment, accuracy, perseverance and independence
6.5	Is able to perform project-based work: is pragmatic and has a sense of responsibility; is able to deal with limited sources; is able to deal with risks; is able to compromise.
6.6	Is actively working on good cooperation and communication within a team

#### 7. Takes account of the context of health sciences

A health scientist is aware of the societal impact of developments within health care and is able to integrate this insight in her/his work	
Master	
7.1	Is able to analyse and discuss societal consequences of new technological developments
7.2	Is able to analyse the consequences of scientific thinking and acting on the efficiency and effectivity of health care
7.3	Is able to recognize and analyse technological developments within the field of health care on a national and international level.
7.4	Is able to identify, specify and debate ethical and normative aspects that are related to technological developments within the field of health and is able to integrate these aspects in his/her work.
7.5	Is able to interpret socio-economic, individual and cultural factors within the challenges addressed in health sciences.

### **Article 3 Admission committee**

1. The Dean of the TNW Faculty establishes an admission committee for the purpose of admitting students to the Master's programme for whom the Master's programme in question is not a follow-on Master's as stipulated in article 7.30a of the Act.
2. The committee, as stated in clause 1, has been authorised by the Executive Board (reference S&C/387.191/lk) to admit or reject applicants.
3. The admission committee consists of:
  - a) the Programme director or programme manager
  - b) A professor or delegated representative involved with the education and research programme in the master (content specialist)
  - c) study-advisor or admission officer

### **Article 4 Admission to the programme**

1. Direct admission to the programme can be obtained by:
  - a) A Health Sciences bachelor's degree from the University of Twente
  - b) A Health Science bachelor's degree from another Dutch University
2. All other candidates will be reviewed by the Admission committee
3. If a pre-master programme is required for admission to the master, the content of the pre-master programme will be decided by the admission committee.

### **Article 5 Language of teaching and exams**

The courses and the exams in the Master's programme are in English.

The report of the Master's project will be written and defended in English. Students are free to make a translation or summary in Dutch once this is necessary for the dissemination of the research results, but the final grade will be based on the original version in English.

**Article 6 The masters' exam**

TRACK	Q1	Q2	Q3 Q4
Personalized Monitoring & Coaching	201600024 (15 EC)  <b>Methods for Early Health Technology Assessment</b> - Big Data (5 EC) - Stakeholder elicitation and decision support (5 EC) - Health Economic Modelling (5 EC)	201600027 (5 EC) <b>eHealth Development: A Holistic Approach</b>	201600036 (30 EC)  <b>Master Assignment</b>
		201600028 (5 EC) <b>Telemedicine and Data Analysis for Monitoring</b>	
		201600029 (5 EC) <b>Monitoring &amp; Persuasive Coaching</b>	
Optimization of Healthcare Processes (IOHP)		201600030 (5 EC) <b>Optimizing Healthcare Processes</b>	201600036 (30 EC)  <b>Master Assignment</b>
		201600025 (5 EC) <b>Finance &amp; Healthcare Purchasing</b>	
		201600032 (5 EC) <b>Quality Management in Healthcare</b>	
Innovation in Public Health		201600033 (5 EC) <b>Public Health innovations</b>	201600036 (30 EC)  <b>Master Assignment</b>
		201600034 (5 EC) <b>Public Health: Dynamics in policy, law and regulation</b>	
		201600026 (5 EC) <b>Health Economics: Maximizing Societal Welfare</b>	

Elective options and requirements to elective:

The Master's programme HS offers its students elective choices, by choosing one of three tracks:

- Personalized Monitoring & Coaching (eHealth)
- Optimization of Healthcare Processes (IOHP)
- Innovation in Public Health

The choice for one of the tracks requires the student to follow all subjects of that track. It is not permitted to choose a mix of subjects from each track. Subjects from a different track can only be chosen as an additional subject within the individual study programme

The first quartile (Q1) is a shared course. During this quarter the student has to choose one of the three tracks and is obliged to finish their education by doing their research thesis within the specialisation of the track that has been chosen.

An additional (individual) accent in the programme may result from the student's choice of the subject for his Master's thesis (Q3 and 4).

## **Article 7 Transitional regulations**

1. If the study programme included in article 6 of this appendix is amended, or if one of the articles in the general section or in this programme specific appendix is amended, the programme director will stipulate and publish transitional regulations.
2. The conditions which transitional regulations must meet are stipulated in article 8.4 of the general section.
3. The transitional regulations are published on the programme's Blackboard page.

## **Article 8 Safety**

There are safety requirements for working in a laboratory<sup>1</sup>, hospital or other health institutions. Students are obliged to inform themselves of these rules and adhere to them.

## **Article 9 Sequence of units of study**

In order to start with the Master thesis you are required to have acquired 20 EC of the Master programme.

## **Article 10 Flexible programme**

Notwithstanding the provisions in article 6 of this appendix the student can submit a request to the Board of Examiners to follow a flexible programme as referred to in art. 7.3d of the WHW. The Board of Examiners will assess whether the flexible programme, fits the domain of the masters programme, is coherent, and of a sufficient level in light of the aims and attainments of the programme.

## **Article 11 Student counselling**

1. The study advisor advises and guides individual students regarding all aspects of their studies and academic progress.
2. The study advisor also informs and advises the staff of the programme regarding educational policies in relation to individual students.
3. The study advisor will provide solicited and unsolicited advice to the Board of Examiners regarding decisions that affect individual students. The study advisor and Board of Examiners will ensure that information about the student is kept confidential.

## **Article 12 Commencement and amendments**

These rules and regulations will come into effect on 1 September 2017 and replace the rules and regulations of 26 April 2017.

Enacted by the Dean of the Faculty of Science and Technology, having obtained recommendations from the Faculty Council and programme committee.

Enschede, 31 August 2017.

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<sup>1</sup> See the 'Health & Safety and Environmental Regulations' ('Arbo- en Milieureglement') on <http://www.tnw.utwente.nl/intra/diensten/amh/> and the TNW laboratory practice group information on [http://www.tnw.utwente.nl/onderwijs\\_overig/practica/](http://www.tnw.utwente.nl/onderwijs_overig/practica/).