Faculty of Science and Technology

UNIVERSITEIT TWENTE.

Programme-specific part 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, 7.59 and 9.5 WHW*)

Contents

Preamble

1. The rules and regulations in this programme-specific part apply to the Master of Science programme of Health Sciences.

2. Together with the General section (TNW/24.1017) this programme-specific part constitutes the programme section of the Student Charter including the education and examination regulations of the Master of Science programme of Health Sciences of the Faculty of Science & Technology.

3. The rules and regulations established by the Examination Board 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 'Examination Board' Rules of the Health Sciences master's programme.

Date: July 11, 2024
Reference: TNW/24.1024

Chapter 1   Definitions

Article 1.1   Definitions

Terms used in this regulation and common to the law on Higher Education and Research act (WHW) are defined according to the General section of the programme part of the student charter, including the education and examination regulations (EER) of the faculty of Science and Technology. The EER of the S&T faculty is further referred to as 'general section of the EER S&T'.

Chapter 2   Admission

1. The admission committee of the master Health Sciences consists of:
    a. Program Director
    b. Study advisor
2. Direct admission to the study programme is obtained by:
    a. a diploma of the bachelor's degree programme in Health Sciences from the University of Twente or another research university in the Netherlands
    b. a certificate of admission to the study programme issued by the admission committee.
3. Admission to the programme subject to certain conditions can be obtained by:
    a. a student who is in possession of a bachelor's degree from a Dutch university. Paragraphs 3 to 8 may apply.
    b. A student who holds a diploma from a University of Applied Sciences (hbo) from a programme relevant to the field of study. Paragraphs 3 to 7 may apply in this case.
    c. A student who has obtained an international bachelor's or master's degree. For conditions and procedures see website. In addition, paragraphs 3 to 8 of these regulations may apply.
4. In assessing the application for admission to the master's programme, the admission committee may demand that certain courses are passed before a certificate of admission to the master's programme will be issued.
5. When issuing a certificate of admission to the master's programme, the admission committee may decide to exempt the student from the obligation to complete certain units of the master's programme, with the exception of the final project. An exemption may not exceed the value of 10 EC.
6. The decisions of the admission committee referred to in paragraph 4 of this article require the approval of the Examination Board.
7. When issuing a certificate of admission to the master's programme, the admission committee may set conditions with regard to the specific content of the student's master's programme and determine that the admission is only valid for a certain track.
8. Students with a foreign education must be able to demonstrate sufficient English language proficiency, both oral and written. As an entry requirement they may be required to meet the standard score on a recognised test. This means a total score of 6.5 or higher on the IELTS test or a score of 90 or higher on the internet based TOEFL test. Students with a bachelor's degree from countries with only English as language of higher education are exempted from this language requirement.

Chapter 3   Content and structure of the programme

Article 3.1   Competence profile Health Sciences University of Twente

A health scientist of the University of Twente has a focus on making healthcare more effective and efficient. The health scientist does so by looking at processes, technology, and systems on the level of the patient and caretaker, healthcare organisation and the healthcare 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.

The competences that a bachelor's and a master's student work on are similar. The objectives per competency are very similar, whereby the further concretisation and level indication is worked out within the learning objectives at module and subject level. The level difference is mainly determined by the content of the education, the complexity of the assignments (context) and the degree of independence with which the student works on issues. These concepts should be viewed in relation to each other. The independence of a bachelor's or master's student is always related to the degree of complexity of the task to be performed. The content and complexity of the tasks to be performed within the various levels are determined, evaluated and, where necessary, adjusted by the study programme and teachers.

Competence	Indicators
1. Research The student develops new knowledge and insights to improve the effectiveness and efficiency of	1.1 The student is able to independently formulate health care-oriented problems and research questions and draw up a research plan. 1.2 The student is able to choose and apply concepts, models, and

healthcare in a purposeful manner and with use of appropriate methodology.	theories within health technology assessment and one of the three specializations* of the Health Sciences Program 1.3 The student is able to collect and analyze qualitative and/or quantitative data and to interpret the findings in relation to the research question/problem statement. 1.4 The student is able to critically evaluate and report the findings and formulate recommendations for application or future research.
2. Advice The student is able to provide expert advice on organizational, policy, technological, and process related topics within the context of health care.	2.1 The student can analyze situations and information using appropriate methodology, gather additional knowledge and make choices that lead to substantiated advice. 2.2 The student is able to approach a question from practice from the various sub-disciplines* within the domain of Health Sciences. 2.3 The student is able to interpret socio-economic, political, individual, and cultural factors within the challenges addressed in health sciences. 2.4 The student can formulate advice from different perspectives about the (added) value of a technology within healthcare.
3. Innovate The student is able to develop policy, products, services, technologies and/or organizational models that improve people's health (or the organization of care).	3.1 The student is able to translate research results into practical applications within the clinical, organizational and policy context of healthcare and to promote their implementation. 3.2 The student is able to actively contribute to the development and adoption of health technology in various phases. 3.3 The student acknowledges the importance of other disciplines and can actively involve them in the innovation process. 3.4 The student incorporates social, cultural, economic, and environmental impacts from a local and a global perspective in all innovations**.
4. Leadership The student is capable to act and to involve others for the benefit of a common interest, by using his personal/professional qualities and by feeling responsibility.	4.1 The student is able to self-direct and achieve goals by being aware of and using his or her own qualities and talents. 4.2 The student is able to reflect on one's own role in the local community and (global)society professional actions. 4.3 The student is able to deal with the changeability of the research process through external circumstances or advancing insight and is able to steer the process on the basis of this. 4.4 The student shows respect for diversity and interests in other perspectives.
5. Communicate The student has the ability to express needs, opinions, knowledge and information efficiently, clearly and adequately (appropriately) in dealing with others.	5.1 The student is able to correctly convey written information to others in English, appropriate to the context in which this takes place. 5.2 The student is able to correctly convey oral information to others in English, appropriate to the context in which this takes place. 5.3 The student listens to other and dares to express his/her own opinion and/or vision. 5.4 The student 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 work. 5.5 The student is aware of his own non-verbal communication and can actively influence this.
6. Collaborating The student can work together with other individuals or groups on a common result, even though this is not for a direct personal benefit.	6.1 The student is aware of his relationship skills and can use them effectively in collaboration with others. 6.2 The student understands and respects diverse cultural backgrounds in collaboration with others. 6.3 The student is able to give and receive feedback, that contributes to the joint result. 6.4 The student shows project management skills and is able to facilitate collaborative and participatory problem solving.

The subdisciplines within health sciences are Health Technology Services Research, Human Resource Management, Health Psychology & Technology, Public Health, Health Economics, Biomedical Sciences, Philosophy of Science & Technology, Operations Management.

** This objective is directly related to the Sustainable Development Goals

Article 3.2   Structure of the programme

1. The Health Sciences program is a one-year program and consists of one semester of educational courses and one semester of performing a research project. The research project leads to writing and presenting a thesis and is therefore also called 'Master Thesis'. Content descriptions of the courses can be found in OSIRIS (educational catalogue of the University of Twente) and on the CANVAS-page of the course.
2. The Health Sciences master consists of 60 EC. In the first quarter all students will follow the same program. During the first quarter the student chooses one of the three tracks to follow in the second quarter. The three tracks are:
    *   Personalized Monitoring & Coaching
    *   Optimization of Healthcare Processes
    *   Innovation in Public Health
3. 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.

Article 3.3   Courses and Assessment Programme

Quarter 1		
Course: Health Economic Modelling (5EC)		
This course will teach students how to collect and synthesize evidence from systematic reviews and meta-analyses, and how to use this evidence to inform health economic models. During this course, students will learn how to develop a health economic model and how to use the result of such models in decision-making around (new) healthcare technologies.		
Examination	% of course grade	I / G[1]
Written Exam	33%	I
Assignment	67%	G
Additional information	- Minimal grade of 5,5 to pass the course - A retake always consists of exam and assignment. It is not possible to retake only one of them.	

Quarter 1		
Course: Stakeholder Preference Elicitation Decision Support (5EC)		
The course "Stakeholder Preference Elicitation and Decision Support" introduces students to a range of techniques for eliciting stakeholder preferences and integrating them into decision-making using MCDA. Students will develop the skills needed to elicit preferences from stakeholders, analyse and visualize the data, and interpret and report the findings. By gaining proficiency in HPM and MCDA, students will be equipped to contribute to more informed and effective healthcare decision-making processes.		
Examination	% of course grade	I / G
Written Exam	50%	I
Assignment	50%	G
Additional information	- Minimal grade for individual exam is 5,0 - Minimal average grade for course is 5,5 to pass	

Quarter 1		
Course: Data Science (5EC)		
The goal of the course Data Science is to teach several data science skills needed in various phases of data analysis projects. The course concept is geared towards *self study* in an assignment & project-driven manner, i.e., it is designed to offer a rich environment for flexible, effective, and efficient self study with ample guidance and supervision. The course is partly assessed (for 60%) with a project that takes about half of the course. There are several projects offered from which the student can choose. A project is composed of a real-world data set and a *challenge*, i.e., what knowledge can potentially be extracted from the data or what the project owner wants to do with the data. The data science skills are offered as *technical topics* from which the student has to choose two. The projects indicate which technical topics provide the necessary skills for doing the project, so the choice for project and technical topics should be coherent.		
Examination	% of course grade	I / G
Assignments	Pass/ Fail	I
Exam	40%	I
Project report	20%	G
Project presentation	40%	I

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[1] I = individual, G = group

Additional information	• This course is offered by and falls under the responsibility of the Master Computer Science of the EEMCS Faculty. • Quarter 1A is meant for HS-students and offers only topics DPV and DM and a project specifically geared towards this study.

Quarter 2: track Personalized Monitoring & Coaching

Course: eHealth Development: A Holistic Approach (5EC)

eHealth refers to the use of technology to support health, well-being and healthcare. There are numerous examples of promising eHealth technologies that are not adopted or soon abandoned due to barriers in implementation, ethics, and evidence. One way to overcome these barriers is to apply a holistic approach towards eHealth development and evaluation. In this master course students will learn this holistic approach through the CeHRes Roadmap. Students will explore the interrelationship between technology, psychology and healthcare and cover all phases of eHealth development, design, implementation, and evaluation. The course primarily provides students with theoretical knowledge of eHealth. As such, it is the perfect basis for participation in the course 'Monitoring & Persuasive Coaching'.

Examination	% of course grade	I / G
Written Exam	100%	I
Additional information	• Open book exam with open-ended questions • Minimal grade of 5,50 for passing the exam	

Quarter 2: track Personalized Monitoring & Coaching

Course: Monitoring & Persuasive Coaching (5EC)

The focus of this course is on persuasive monitoring and coaching eHealth technologies.
Students will learn more about the role of data in the development, design and evaluation of technology. Persuasiveness also takes a central place in this course, which refers to technologies which are designed in such a way that they can influence attitudes and behaviours of people. Students will learn about the relationship between monitoring, coaching, health, data and persuasiveness by gaining hands-on experience with these concepts. In duo's students will work on three different projects that are based on existing research projects.

Examination	% of course grade	I / G
Project 1 (report)	34%	G (duo)
Project 2 (report)	33%	G (duo)
Project 3 (report)	33%	G (duo)
Additional information	• Each project will be assessed by means of a concise written report. Each report will account for one third of the grade. Due to rounding, the first project counts for 34%, the second and third projects for 33%. • Students will be working in duos (to be formed by their own choice) for all three projects and both students will receive the same grade. The duos can be changed per project. • If a subgrade for one of the reports is lower than 5.5, the duo will have to improve the insufficient report. The deadline for this will be set in consultation with the course coordinator. In case of a resit, the grade cannot be higher than a 6.0.	

Quarter 2: track Personalized Monitoring & Coaching

Course: eHealth Technology (5EC)

The aim of this course is to design and develop an end-to-end eHealth technology for short- or long- term care and healthy lifestyle. We do this by addressing 5 main themes: Requirements analysis (2) Data monitoring & analysis (3) Decision support & decision making (4) Feedback & Coaching and (5) Evaluation & implementation. In this course you will work together in a multidisciplinary group (students with different study backgrounds) on a specific case, resulting in different eHealth technologies.

Examination	% of course grade		I / G
Project report	80%		G
Project presentation	20%		G
Poster		50%	
Prototype		50%	
Additional information	• The poster and protype are graded both by students and lecturers. For the final grade for the presentation (poster and prototype combined) students grade counts for 30% and lecturers grade counts for 70%		

Quarter 2: track Optimizing Healthcare Processes		
Course: Healthcare Analytics and Optimization (5EC)		
Operations Management is the activity of managing the resources which are devoted to the production and delivery of products and services. It is a broad field including, among others, capacity management, inventory management, quality management, and supply chain management. Healthcare faces aging populations, attrition in the workforce and pressure to adopt new, costly technologies. Moreover, the healthcare systems suffer from inefficiencies and inequalities. To overcome these problems, health system leaders and managers require analytical models, in particular OM models, to analyze the system and to improve it. The objective of this course is to provide students with various operations management (OM) tools and techniques for the analysis and optimization of healthcare delivery processes.		
Examination	**% of course grade**	**I / G**
Assignment 1	See Additional information below	G (duo)
Assignment 2		G (duo)
Assignment 3		G (duo)
Assignment 4		G (duo)
Assignment 5		G (duo)
Written Exam – Open questions		I
Additional information	- Four grades are possible for each assignment: excellent, good, sufficient, fail. - If you receive an "excellent" grade in your first attempt, you are rewarded with 0.2 bonus point toward your end-of-term grade. - If you receive a "good" grade in your first attempt, you are rewarded with 0.1 bonus point toward your end-of-term grade. - If you receive a "sufficient" grade, you do not redo the assignment, but you also do not get any bonus points. - If you receive a "fail" grade, you have one week to redo the assignment from the moment that the grade was announced. You do not get any bonus points. - Assignments should all be completed at least "sufficient"; otherwise, you cannot take part in the exam. - The deadlines are strict. If you are too late, the result will be graded 'fail'.	

Quarter 2: track Optimizing Healthcare Processes		
Course: Quality Management in Healthcare (5EC)		
Healthcare organizations worldwide are facing challenging quality and safety issues caused by global trends, such as ageing and lifestyle changes. These quality and safety issues are becoming increasingly important in healthcare organizations, especially in those with complex, technological processes. In addition, benchmarking and the relation with efficiency are major topics in this field. In the course 'Quality Management in Healthcare' students will gain knowledge on the history and it will be discussed how trends influence future development of quality and safety management. This will provide insight in ways how quality and safety of healthcare organizations can be improved and optimized. The extent and nature of the quality and safety issues will be presented and approached on (inter)national and institutional levels.		
Examination	**% of course grade**	**I / G**
Exam – open questions & case studies	90%	I
Report	10%	G
Paper presentation*	P / F*	G (duo)
Additional information	* a pass (P) for the paper presentation is required for passing the course. An 'F' will result in an insufficient grade for the course.	

Quarter 2: track Optimizing Healthcare Processes

Course: Finance and Healthcare Purchasing (5EC)

This course covers both finance and purchasing for healthcare providers (e.g. procurement of medical equipment) and the finance and contracting of healthcare itself (e.g. contracting healthcare providers by insurance companies and municipalities). These are important topics worldwide, often discussed in the media and are frequently topic for political debate. Purchasing related operating costs of Dutch healthcare providers add up to about € 18 billion. The purchasing quote of healthcare insurers is estimated to be more than 95% of their total turnover.

For the topics mentioned above and within the Dutch context, the course deals with issues such as: How can contracting healthcare help in reducing healthcare expenses and/or improve the quality of healthcare? How can healthcare providers use their finance and purchasing function to more efficiently and effectively contract suppliers? How can healthcare providers respond to insurance companies and municipalities (healthcare selling)?

Examination	% of course grade	I / G
Exam – MC and Open questions	67%	I
Assignment – write article	33%	G (2-3 persons)
Assignments	Max 0,5 bonuspoint	
Additional information	• A minimal grade of 5 is required for a pass for each of the Exam and Article • 0,5 bonuspoint for the grade of the exam if all assignments (article not included) are passed.	
Additional information	• * a pass (P) for the paper presentation is required for passing the course. An 'F' will result in an insufficient grade for the course.	

Quarter 2: track Innovation in Public Health

Course: Citizen Science & Public Involvement (5EC)

In this course we will examine what citizen science and public involvement are, how it can be accomplished, and what the benefits and barriers of such approaches are. As health scientists, this approach to research and policy can be beneficial wherever their career may take them. Patients and the general public become more vocal and demand to be heard. They have specific knowledge that a researcher or policy maker is probably lacking. This course gives the students tools to incorporate this knowledge into their work.

Examination	% of course grade	I / G
Presentation	70%	G
Written assignment	30%	I

Quarter 2: track Innovation in Public Health

Course: Public Health Innovations (5EC)

This course provides students with a state-of-the-art knowledge and insight into the processes of diffusion and implementation of medical technologies in public health care organizations and networks. Public Health innovations are implemented in open interaction between clients, professionals, and (networks of) organizations. Increasingly, organisations and professionals must intensively and successfully collaborate to improve the quality of public health and well-being of the population. In this course, we study how organisations and professionals optimally collaborate in the implementation of public health innovations. Substantive examples of innovations covered are in the areas of child death, child abuse, elderly care and obstetric care.

Examination	% of course grade	I / G
Assignment	100%	I

Quarter 2: track Innovation in Public Health

Course: Dynamics in Policy, Law & Regulation (5EC)

In this course, a framework is provided for studying how local public health actions are built and shaped over time, how they are contested in the process rather than generated by technocratic expertise, how implementation, monitoring and enforcement are challenging for public officials and private organizations involved in public health, and how local policy, law and regulation is embedded in national and international requirements and support mechanisms. This includes the European Union, which coordinates between national health and legal systems of its member states and sets out the frameworks for adopting global standards and programs from the World Health Organization and other international bodies. Throughout the course, the students apply their knowledge about policy, law and regulation to a concrete case

of public health innovation. Students prepare a presentation and a short paper analyzing the legal and regulatory challenges for health innovations with the help of the tools learned in the course.

Examination	% of course grade	I / G
Assignment	80%	G
Presentation	20%	I

Quarter 3 & 4: Master Thesis (30EC)		

In the second semester of the Master programme a scientific research project is conducted within the field of Health Sciences. The research project leads to a research report (Master Thesis) and a presentation with discussion (colloquium).

Examination	% of course grade	I / G
Report (thesis)	60%	I
Presentation (colloquium)	20%	I
Process (Professional development)	20%	I

Article 3.4 Master Thesis

1. In order to start with the Master thesis, the student is required to have acquired 20 EC of the Master programme.
2. The student can only start with the Master thesis once the project has been approved of by the assignment committee. An assignment is officially approved only after being uploaded to Mobility Online.
3. By means of approval based on the Approval form Master Assignment, the Examination Board GZW-HS:
   - approves of the composition of the Graduation Committee responsible for the supervision and the assessment of the thesis project.
   - appoints the members of the Graduation Committee as temporary examiners for the master thesis.
4. The regular time for completing the master thesis is 840 hours (30 EC), which is 20 weeks for a full-time student. Deviant time schedules for part-time students are only permitted when they have been agreed upon beforehand by the student and the student's first supervisor and are part of the information on the form Approval form Master Assignment.
5. Should the student not succeed in completing the master thesis within the abovementioned period of time, the Graduation Committee can grant extra time to the student to do so. The extra time to be granted is bound by the limit of 50% (10 weeks) of the regular duration of the thesis for a full-time student.
6. Only in exceptional cases is it possible to obtain a postponement in addition to the extra time. If it is not possible for the student to complete the thesis within 20 weeks plus 10 weeks extra time, the student must submit a request to the Examination Board GZW-HS for extra time. The Graduation Committee must also agree to this request.
7. If the student has not yet completed the thesis after the extra time has expired or no pass to proceed (green light) to defense the thesis has been given by the first and second supervisor, the Graduation committee can terminate the thesis project. Prior to this decision the Graduation committee will hear the student and the programme director.

Article 3.5 Language of tuition

1. The courses and the exams in the master's programme are in English.
2. The master thesis will be written 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. The colloquium will, in close consultation and approval of the examiners, be held in English or in Dutch.

Article 3.6 Safety

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

Chapter 4 Teaching and assessment

Article 4.1 Assessments

1. Regulations regarding teaching and assessment are provided in chapter 4 of the general section of the EER S&T.
2. Examination results are graded according to the assessment and grading scheme provided in the course manual and in line with article 4.3 of the general section of the EER S&T.

Article 4.2   Evaluation of Education

The quality of education is systematically evaluated and monitored.

Each course of the master is evaluated. The following actions support the evaluation of each course:
1.   course specific questionnaire to be filled in by the students.
2.   panel meeting with students, lecturer(s) and representative of the programme
3.   evaluation report based on questionnaire and panel meeting
4.   every two years a quality check on assessment.

More information on the evaluation and quality assurance can be found in the GZW-HS Quality Assurance Manual.

Chapter 5   Principles of following two master's programmes

1.   Article 2.1, paragraphs 6 and 7 from the general section of the EER S&T are applicable.
2.   Students have to make a planning for their two master programmes and discuss this with the study adviser.
3.   The master programme Health Sciences consists of 6 obligated courses of 5EC each and a Master project of 30EC.
4.   Based on previous acquired knowledge & skills exemptions for courses can be granted by the Examination Board (article 3.3 of the general section EER S&T). Exemptions can be granted to a maximum of 10EC.
5.   The thesis needs to meet the requirements as set within the Health Sciences Master programme. Specific requirements regarding the thesis in case of combined master programmes are:
     • The research proposal may be combined but must contain at least two different research questions. Of which at least one research question is specifically related to Health Sciences.
     • The examination committee of the Health Sciences thesis is appointed by the examination board. Only one member of the examination committee can be a member of the examination committee for both programmes (if applicable).
     • The colloquium can be combined under the condition that both research questions are addressed. The grading of the colloquium will be separate.

Chapter 6   Student guidance

In addition to chapter 6 of the general section of the EER S&T the following applies for the master Health Sciences;
1.   The study advisor advises and guides individual students regarding all aspects of their studies and academic progress.
2.   The study advisor 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 Examination Board regarding decisions that affect individual students. The study advisor and Examination Board will ensure that information about the student is kept confidential.

Chapter 7   Studying with a functional impairment

Article 7.1   Studying with a functional impairment

In addition to article 7.2 of the general section of the EER S&T; the Dean of the faculty has mandated this to the program management of Health Sciences. In line with article 7.2 of the general section of the EER S&T, the student always needs to contact the study advisor to start a request for study adjustments.

Chapter 8   Amendment

Article 8.1   Transitional arrangement

In the event of amendments to this programme-specific part, the provisions of Articles 8.3 and 8.4 of the general section of the EER S&T shall apply.

Article 8.2   Commencement

These Regulations come into force on the 1st of September 2024 and replace the Regulations of the 1st of September 2023.

Adopted on July 11, 2024, by the Faculty Board of the Faculty of Science & Technology, after having obtained the consent of the Faculty Council with article 2.4 (sequence) and the Programme Committee with articles 3.1, 3.2, 3.3, 3.6 and 4.2.