University of Twente

Faculty: Engineering Technology (ET)

Master's programme

Sustainable Energy Technology (SET)

The programme-specific part of the STUDENT CHARTER OF THE UT Article 7.59, WHW*
Education and Examination Regulations (OER)** Article 7.13, WHW

2017 – 2018

Reference number: xxxxxxxxxxxxxxxxxxx.
Approved by the Dean of the Faculty of Engineering Technology on 31 August 2017

* WHW = Wet op het hoger onderwijs en wetenschappelijk onderzoek = Higher Education and Research Act
** OER = Onderwijs- en examenregeling

FOREWORD

The Sustainable Energy Technology programme has chosen to embed in the Education and Examination Regulations within the programme-specific part of the Student Charter on the basis of Article 7.59 of the [Dutch] Higher Education and Research Act (WHW). For general information, reference is made to the 'Student Charter of the UT, the institution-specific part'. For special possibilities within the study programme, reference is made where necessary to the education page of the Master's programme Sustainable Energy Technology (http://www.utwente.nl/set) and for information about course content to the 'OSIRIS course information'.

In this document the rules (rights and obligations of the programme and of the students) are reproduced. The core of these rules is that they apply to all students in general. On personal grounds, individual students have the right to request the examination committee to take an action which deviates from the regulation. The examination committee can also decide to take a general or an individual action which deviates from the regulation, provided that it is to the advantage of the student.

When the student does not agree with an action taken by the programme, or a procedure or decision of a teacher or assessor, the basis and the procedure for making an appeal are given in this regulation. An adapted programme applies to students with a rounded-off previous education in a university of professional education (HBO) in the sector Engineering and Technology. This programme consists of a premaster's part which leads to admission to the master's programme. The admission regulations are part of this Charter. Because the premaster's programme consists of a selection of bachelor courses, the bachelor's Education and Examination Regulations (OER) apply for the programme. The programme is provided within the Faculty of Engineering Technology (ET) at the University of Twente (UT) in Enschede, The Netherlands.

All master's students are informed by e-mail of the publication of the new Student Charter for Sustainable Energy Technology with a reference to the relevant website. Agreements made with potential students before the approval of the Student Charter, and which deviate from it, are respected.

The Student Charter 2017 for Sustainable Energy Technology is applicable to all master's students participating in the Master's programme in 2017 -2018 and to HBO-ers[1] who start the premaster's programme in September 2017.

J.B.W. Kok
Director of Education

G.G.M. Stoffels
Programme Coordinator

[1] Students at or graduates of a [Dutch] university of professional education 'hogeschool' (HBO)

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1. GENERAL CONDITIONS

1.1 Applicability of the Regulation

1.1.1 This regulation applies to the education and the examinations of the master's programme in 'Sustainable Energy Technology', hereafter called: the programme.

1.1.2 The programme is provided under the responsibility of the Faculty of Engineering Technology at the University of Twente, hereafter called: the Faculty.

1.1.3 The final responsibility for the implementation of the education programme rests with the Director of Education and for admission and assessment with the Examination Board. A student who doubts whether he has been handled in conformance with the regulations can ask the Director of Education for clarification. It is always possible to appeal against a decision that has been taken.

1.2 Definition of terms

1.2.1 In this regulation terms have the following meanings:

a. **BOZ**: Office of Educational Affairs (Bureau Onderwijszaken), Engineering Technology (Sustainable Energy Technology), within the Unit S&O (student & educational services);

b. **Dean**: the Dean of the Faculty of Engineering Technology;

c. **Programme Council**: The Programme Council consists of chairmen of Departments and general professors in the Faculty, whose subject area(s) belong to the domain of sustainable energy technology, as well as members of the Board of the Faculty;

d. **EC**: European Credit; a unit of study effort in which 1 EC matches 28 hours of effort; a course year is 1680 hours = 60 EC;

e. **Graduation examination**: An evaluation by which the Examination Committee determines whether all examinations of the courses belonging to the programme have been passed (in conformation with Article 7.10 of the [Dutch] law);

f. **Examination Board**: The Examination Board of the programme constituted in conformation with Article 7.12 of the [Dutch] law;

g. **Examiner**: The person appointed by the Examination Committee for conducting examinations, in conformation with Article 7.12 of the [Dutch] law;

i. **Faculty**: The Faculty of Engineering Technology (ET), University of Twente;

j. **Institution**: The University of Twente (UT);

k. **Management Team**: The Board of the Faculty of Engineering Technology;

l. **SET** Sustainable Energy Technology; this qualification prefixing, for example, student, programme, examination, etc is in many cases in this Charter hereafter omitted in the interests of readability.

m. **Programme**: The Sustainable Energy Technology programme (SET), University of Twente;

n. **Director of Education**: The Director of Education of the SET programme;

o. **Partner Institution**: An institution with which the university has a structural relationship for collaboration, in which the programme is active. For example the 4TU federation and the ECIU[2]-network (http://www.eciu.org/);

p. **Student**: He or she who is registered as student at the University of Twente for the following of education and/or the taking of examinations of the 'Sustainable Energy Technology' programme, and who has completed the payment of (legal) tuition fees (Articles 7.32 and 7.34, WHW).

Wherever in this regulation the male gender is used, the female gender can also be understood;

[2] European Consortium for Innovative Universities

q. **Academic year**: The time period that begins on 1 September[3] and ends on 31 August in the following calendar year;

r. **Course**: A component of the study programme to which a course code is assigned;

s. **Examination [tentamen]**: An inquiry into the knowledge, the insight and the skills of a student relating to a particular unit of education, as well as the assessment of that inquiry by at least one examiner designated by the Examination Committee for that purpose;

t. **Web-site**: The web-site **www.utwente.nl/set** ;

u. **Working day**: Monday to Friday inclusive, with the exception of recognised holidays and leave days and/or holiday period approved by the UT;

v. **Law**: The [Dutch] Higher Education and Research Act (WHW).

1.2.2 A student has the right to follow education and/or take examinations relating to the programme, provided he has satisfied the legal regulations in force (see 1.2.1p). Where someone has not (completely) met these requirements and at that moment still takes part in the education and/or examinations, this is regarded as irregular. Where applicable, the relevant registered student data can be removed from the administrative records and does not count for student progress nor for student grants and loans. Additional conditions can be placed on participation in the various education activities and examinations.

1.3 Emergencies

1.3.1 The University Board (CvB[4]) of the University of Twente or, on its behalf, the representative in the particular building, determines whether there is a (threatening) emergency. When this has been determined, (a part of) the relevant building will be evacuated according to the relevant procedures in force.

1.3.2 When such emergencies occur, or threaten to occur, during or just before an examination, the following procedures apply:

a. Where an emergency is expected before the start of an examination, the examination is immediately postponed. In consultation with the Director of Education and/or the Education Affairs Office (BOZ), the responsible teacher determines a new time for the examination. The new confirmed examination time, that takes place within one month (exclusive of the vacation period), is obligatory. This is published within three working days using the usual media.

b. Where an emergency occurs, or is expected, during an examination, the following procedures – where possible – apply:
   - At the beginning of the examination, the student writes his name and student number on all the examination work.
   - **At the request of the responsible authority or invigilator those present should leave the examination room immediately.**
   - Students leave the work they have done behind in the examination room.

1.3.3 Where the opportunity has already occurred to begin the examination, and where it is reasonably possible, the teacher determines a final mark on the basis of the (partly) completed answers.

1.3.4 Where the teacher cannot determine a final mark on the basis of the statement in 1.3.3, a repeat examination is organised for the students involved within one month (excluding the vacation period) after the examination has been cut short by the emergency. Students are considered to be 'involved' if they had registered for the original examination.

1.3.5 Where emergencies occur, or threaten to occur, during or shortly before a lecture or practical, this is immediately postponed.

In consultation with the Director of Education and/or the Education Affairs Office (BOZ), the teacher responsible for the course determines a new time for the lecture or practical. This time is published using the usual media at the latest the day after the building has been re-opened.

[3] In most cases the **course** begins somewhat earlier (mostly in week 35 or 36)
[4] College van Bestuur

1.4 Safety Regulation

1.4.1 For the complete Safety Regulation for Engineering Technology (ET) and a list of names of the Company Emergency Response Team[5] (CERT), see:
https://www.utwente.nl/et/intranet/arbo_milieu_huisvesting/Veiligheid/veiligheidsreglement12/
For the regulations for working conditions (ARBO) and the environment, see:
http://www.utwente.nl/hr/vgm/organisatie_informatie/informatie/arbowetgeving/

1.4.2 Prevention of Repetitive Strain Injury (RSI) is an important point of consideration for the programme, although the final responsibility rests with the student himself. For further information about prevention of RSI, reference is made to the web-site:
http://www.utwente.nl/hr/en/health-safety-environment/health-welfare/rsi/

1.4.3 A student is only entitled to participate in the education when he has informed himself of and conducts himself in accordance with the safety and working conditions (ARBO) regulations as described in article 1.4.1.

1.4.4 Additional safety requirements can apply for graduation work in specialist laboratories. A student is only entitled to participate in this research when he has informed himself of and conducts himself in accordance with these additional safety requirements.

1.5 Insurance

For insurance during an internship[6] (in-company and/or abroad) and/or a project, see the general 'Student Handbook' http://www.stage.utwente.nl/en/Manual/manual/stagehandleiding%20Engels.doc/h6.html, under the chapter 'Insurances'

1.6 Rights of ownership

The rights of ownership of the results of tasks, assignments and projects which are carried out in the framework of the programme rest with the Faculty of Engineering Technology.
No rights can be derived to the relevant student for (parts of) results of a project, research or assignment undertaken under the commission of the UT, unless this is agreed with the Faculty management before the start and is confirmed in writing. Agreements with the company concerning the public access to the results, the final report and the duration and extent of confidentiality should be confirmed beforehand by the Board of the faculty ET.

2. VISION OF THE PROGRAMME (Article 7.59 paragraph 4 subparagraph a, WHW)

2.1 Aims of the programme

The following items regarding the programme are included in appendix 1, Manual Master thesis SET:

a. programme composition and relevant examinations
b. whether the programme is full-time, part-time or a sandwich course
c. composition of the specializations
d. study load of the programme and of each of the units of study making up that programme
e. number and sequence of examinations and practical exercises
f. whether the examinations will be administered in an oral, written or other format
g. the content of the practicals
h. if and when necessary, that a satisfactory result on an examination is a prerequisite for admission to other examinations
i. if and when necessary, that the requirement to participate in a practical will be part of the admission procedure to a particular examination
j. the units of study from which the student may choose to fulfil programme elective requirements

[5] BedrijfsHulpVerlenings-team (BHV)
[6] Dutch 'stage', sometimes called 'placement'

k. the transitional regulations as referred to in article 20

The collaboration of SET with the University of Delft and Eindhoven are included in appendix 2

Appendix 1 form an integral part of these regulations.

2.2 The programmes final attainment levels

The *objective of the Master's programme SET* is to educate academic engineers who possess scientific knowledge on and insight into the design, behaviour and performance of energy technologies and the integration of these technologies in grids, buildings and society at large. The learning outcomes ('exit qualifications') are operational definitions of the programme goals and describe the knowledge, skills and attitudes that students should have acquired after completing the programme. Regarding academic competences the graduate has the following intended learning outcomes:

A Master of Science graduate of the SET degree programme:

1. is qualified to degree level within the domain of 'science engineering & technology'
2. is competent in the relevant domain-specific discipline(s), namely Sustainable Energy Technology, i.e.
   - 2.1. has a thorough understanding of at least one sub-area of Sustainable Energy Technology and is able to maintain and expand his/her expertise in this field
   - 2.2. has the necessary knowledge and skills to evaluate a broad range of energy technologies and energy systems, taking into account technological, societal, economic and sustainability aspects
   - 2.3. is able to analyse and understand the role of sustainable energy technologies in a system. Either as part of an electrical system (connection to the grid), as part of a decentralized system (like a building) or the society as a system with opportunities and barriers for the development of sustainable energy technologies
   - 2.4. is able to contribute to discussions about complex matters related to the introduction of sustainable energy
3. is able to conduct research and design independently
4. has the ability and attitude to include other disciplines in their research, where necessary
5. has a scientific approach to complex problems and ideas
6. possesses intellectual skills that enable them to reflect critically, reason and form opinions
7. has the ability to communicate the results of their learning, thinking and decision-making processes at an international level
8. is aware of the temporal and social context of science and technology (comprehension and analysis) and can integrate this context in their scientific work
9. in addition to a recognizable domain-specific profile, possesses a sufficiently broad basis to be able to work in an interdisciplinary and multidisciplinary context. In this context, multidisciplinary means being focused on other relevant disciplines needed to solve the design or research problem in question
10. has the ability and attitude to seek new potential applications, taking the social context into consideration

3. ADMISSION POLICY

3.1 Requirements for previous education

a. Students in possession of a diploma which shows that they have passed the final examination for the following Bachelor of Science's programmes will be eligible for admission to the programme.
   - Aerospace Engineering (TUD)
   - Applied Physics (TU/e, TUD, UT)
   - Advanced Technology (pre-SET track) (UT)

- Biomedical Engineering (TUD, UT)
- Chemical Engineering (TU/e, UT)
- Civil Engineering (UT)
- Design Engineering (UT)
- Electrical Engineering (TU/e, TUD, UT)
- Innovation Sciences (Energy) (TU/e)
- Mechanical Engineering (TU/e, TUD, UT).
- Molecular Science and Technology (TUD and UT)
- Technical Medicine (UT)

b. Students who are not in possession of one of the diploma's mentioned in paragraph a. will require a certificate of admission issued by the Director of Education. Admission criteria to receive a certificate of admission for the Master's programme are the same as the qualities attained at completion of one of the Bachelor Programmes mentioned in paragraph a. regarding knowledge, insights and skills (the preliminary Bachelor's degree).

3.2 Additional requirements for students coming from abroad.

Students from abroad must show they have sufficient command of the English language. If they do not come from a country where English is the native language, they must provide the result of a language test. An IELTS[7] score of at least 6.5 is required.

3.3 Pre-master's programme

3.3.1 Bachelors from a university of professional education (HBO) in construction, mechanical/electrical engineering, physics, chemistry or related subjects are admitted to the pre-master's programme. Admission of others is at the discretion of the Examination Committee.

3.3.2 The pre-master's programme consists of a selection of courses with an emphasis on mathematical courses and academic research and skills.

3.3.3 The pre-master's programme consists of 30 EC. Those entering from a university of professional education who have considerable industrial experience are not allowed to do an internship (stage). Instead of an internship they should follow 15 ec master courses.

3.3.4 A student who successfully passes all courses in the agreed programme within eight months after registration for the pre-master's programme is admitted to the master's programme.

3.3.5 A student who is rejected from a pre-master's programme at one of the three Sustainable Energy Technology programmes in the Netherlands is not re-admitted to a pre-master's programme in a following academic year.

3.3.6 A student who, after the pre-master's programme, is admitted to the master's programme, follows a programme which in certain parts can deviate from that of the regular master's programme, depending on the previous education and the subject of specialisation.

4. EDUCATION AND PROGRAMME

4.1 Implementation of the programme

4.1.1 Provision of information

a. A course description, method of examination and the form of the education should be published before the start of the course. For this purpose reference is made to the 'OSIRIS course information' on the internet, with the reservation that education is susceptible to continuous change. The most up-to-date course information, as it is applicable, is found on Blackboard.

b. The programme ensures the registration of study results.

[7] International English Language Testing System

4.1.2 Composition of the personal study programme

a. The student composes a programme together with a professor in the Department or research group to which he is assigned (called graduation professor or chair holder), more details about the composition of the programme are given in Appendix 1. This programme requires the approval of the graduation professor (chairman of the graduation committee) and the Director of Education.
b. The student hands in the approved study programme to the Education Affairs Office (BOZ) at the latest at the beginning of the second year. Even if this is in many cases a provisional programme, handing it in on time is crucial for the student (admission to courses, and being sure that the course may make part of the graduation programme).
c. In order to be able to make a proposal for the study programme mentioned above, students can use the pre-laid-out form for the study programme on the web-site http://www.utwente.nl/set (see also Annex 1, Appendix 1). This is then discussed with and should be approved by the graduation professor. Thereafter the study programme need to be checked and signed by the Director of Education of SET.
d. Where the examinee wishes to make changes to the choice of one or more courses of the programme which has already been approved, he can submit a request to that effect to the relevant graduation professor. What is stated in 4.1.2a applies for this request (for this purpose the form 'Changing master's courses' is available from the web-site,
   http://www.utwente.nl/set.
e. A course may only be a part of one of the master's programmes.

4.1.3 Internship[8] [9]

a. The extent of the internship is 15 (10 nominal study weeks, including writing the report). The extent of the internship is determined beforehand, and depends on the nature, scope and extent of the project and the necessary residence period.
b. The internship may be started after at least 40 EC of the master's programme has been rounded off.
c. If, after the internship has begun, it is determined that it will not be possible to achieve the intended learning effect, the student will contact the programme to discuss the consequences. It is up to the student to give a timely signal. In all situations where the cause of a non-optimal internship does not rest with the student, an adequate making-good of the lapsed study time will be determined in a flexible manner. The graduation professor takes the initiative for this.
d. The student takes the initiative for arranging an internship location and a suitable project. The programme supports this. For this purpose a mobility coordinator[10] is appointed. The internship project requires the approval of the graduation professor and the mobility coordinator. The graduation professor is responsible for assessment of the content. The mobility coordinator determines whether the project conforms with the general UT and programme policies and provides adequate administrative support.
e. During his internship the student receives supervision from a staff member of the programme (usually from the Department within which he will graduate).
g. The programme will make no financial demands on the organisation which provides the internship.
h. Further information about the practical carrying out of the internship and/or the subsidy regulation is available from the Sustainable Energy Technology mobility coordinator. There is also an 'Internship handbook', which is published annually. See also the handbook, subsidy regulations, insurances, etc on http://www.utwente.nl/set.

[8] Dutch 'stage', sometimes called 'placement' or 'traineeship'.
[9] Bachelors entering from a university of professional education (HBO) who have considerable industrial experience are not allowed to do an internship (stage). Instead of an internship they should follow 15 ec master courses
[10] Dutch 'mobiliteitsmedewerker', sometimes called 'placement officer' or 'exchange coordinator'.

4.1.4 Internationalisation

The programme has the aim of allowing all students to have an international experience during the study. This can be a company internship, an internship in a university or scientific institution, a graduation project and/or the following of a number of regular courses at a foreign university. For the extra costs made for this purpose, there are subsidy regulations for which only once during the programme is it possible to claim. See the subsidy regulations: http://intoffice.utwente.nl/en/financial/.

4.1.5 Regulation for including international courses in the master's study programme

a. For this purpose and well before departure to the university abroad, the student makes an agreement with the graduation professor. The student explains the reasons for his request and provides the necessary (course) information.
b. The graduation professor is responsible for determining the level of the course(s) to be taken abroad. He can delegate this to a UT teacher who provides a comparable course. In principle the international course must have a level equivalent to that of UT courses.
c. Where the content of an international course does not match a master's course in UT, the graduation professor can consider making the course a 'special subject' ('capita selecta') course.
d. No international courses may be included which substantially overlap with regular UT courses which have already been completed or which still have to be rounded off.
e. There is no automatic translation of international study points into UT study points (EC). The Office of Educational Affairs determines the number of ECs. The starting point for this is the agreements in the framework of the ECTS (European Credit Transfer System).
f. The maximum number of study points for international courses which can be taken up in the core and elective programme is 30 EC. The surplus of courses can be added to the marks list of the degree certificate as 'extra courses'.
g. One exception can be made relating to 'the maximum number of international courses' in point f: where the student participates in a master's programme that is set up together with a partner university, and the education and assessment of it takes place at the partner university. The [relevant] programme should be approved and countersigned beforehand as-a-whole by one of the professors of the programme and by the Director of Education.
h. The agreement as mentioned in a. needs to be confirmed by using the form 'Inclusion of international courses'; this form has to be signed and handed over to the Office of Educational Affairs (BOZ). The Director of Education agrees the request.
i. Where possible, the Education Affairs Office takes the international names of the courses over to the Diploma Supplement.

4.1.6 Master's project

The procedure of the master thesis is given in the manual Master thesis SET in Appendix 1

4.2 Requirements for attendance and participation in education

There are no requirements for attendance or participation in order to follow education units which are offered in the form of lectures or plenary meetings, unless this is determined otherwise beforehand.

- Enrolment may be required for participation in tutorials or seminars. Moreover preparation and regular participation is assumed. Where it seems that this requirement is not met, or not sufficiently met, participation can be excluded.
- For admission to participation in a practical and projects, in general the requirement is that previous courses or study phase(s) have been successfully completed. Above all, there is a requirement to be present and to participate actively. A practical and projects can only be rounded off with a satisfactory result if all prescribed courses have actually been carried out within the prescribed period.
- For admission to participation in theory courses, the general requirement is that previous courses which prepare for the relevant course have been satisfactorily completed ('OSIRIS course information').

Not participating in education in an education period can result in not passing the examinations, projects or a practical. The programme takes no responsibility for this at all.

In cases beyond one's control (*force majeure*) (for example, ill health) the student should immediately contact the teacher who is responsible for the missed course of education.

4.3 Language (Article 7.2, WHW, see also central part of the Student Charter of the UT, Article 3.1.3)

4.4.1 The education is given, and the examinations are taken in English.

4.4.2 The graduation report is written in the English language.

5. TAKING EXAMINATIONS AND GRADUATION PROCEDURE

5.1 Definition of terms

5.1.1 The programme recognises no examination session for the programme as a whole; all courses are examined separately. A course examination is called an examination (tentamen). The total of the results of the examinations taken is registered in Osiris for assessment within the graduation procedure.

5.1.2 Meaning of terms in 'manner of assessment':

- written examination: Written test.
- oral examination: Oral test (see also article 5.8, oral examinations).
- project examination: (In principle oral) test on the basis of written reporting, which is the result of an assignment, carried out in the appropriate period by a group of students. A presentation, defence and cross-questioning often make up a part of the project examination. The testing can be organised on either an individual or group basis.
- practical: (practical) exercise; (see also article 4.3, requirement for participation in (practical) exercises).
- part-test: a part of an examination: the part-tests together (combined where applicable with another method of assessment) form the basis for a final mark.
- project (assignment): Homework answers, essay, problem, practical, product, presentation, colloquium, and so on. The determining factor is that the student delivers an achievement which is to be assessed. The examiner publishes further details.
- portfolio / file of documents : A reproduction of the competencies achieved and the activities undertaken in the framework of development of competencies and the results thereof (products and/or assessments). The whole gives an impression of how the student is developing himself as a 'prospective master'.

5.2 The Examination Board

5.2.1 The Examination Board consists of a chairman, registrar, secretary, 4 members and the director of education as advisor.

5.2.2 Composition of the graduation committee is stated in the Manual Master thesis in Appendix 1

The chairman of the graduation committee can invite others as experts to attend the examination session as guest. Guests have no voting rights. Members of the Examination Committee and the Director of Education are always empowered to attend examination sessions.

5.2.3 The meetings of the graduation committees and of the Examination Board take place in closed session.

5.2.4 Where a member of the graduation committee is prevented from attending an examination session, he can be replaced by a member who has authority to conduct examinations. The substitute should identify himself as such to the chairman before or at the start of the meeting. The substitute has the voting rights of the member he replaces.

5.3 The sequence of examinations

5.3.1 Disqualification from participation in projects or (practical) exercises.

Before the start of an education period, the Examination Committee can limit the participation of students in projects or (practical) exercises to those students who have made sufficient progress in the courses preceding the project or practical.

5.3.2 Regulation for administrative secondary activities and/or top sport

a. The student who satisfies what is stated in c. and d. below, and who considers taking part in recognised administrative secondary activity or activities or has the status of top sportsperson, may count on the support of the programme.
b. In the opinion of the programme at the moment the request is made, the study progress of the student must be reasonable to good.
c. The secondary activities must be of a limited extent and duration.
d. The student should consult in good time the relevant education coordinator or graduation professor, during which among other matters the study planning and the planning of the secondary activities are discussed.
e. The agreements made about them are confirmed in writing and after they have been countersigned by the coordinator and the student, they are handed in to the Education Affairs Office (BOZ).

5.4 Time periods, times and frequencies of examinations

(Article 7.13 paragraphe 2 sub-paragraphe f, WHW)

5.4.1 At the beginning of a quarter a timetable is published in which the dates of written examinations are stated.

5.4.2 In the case where an examination can be taken orally, this can be taken at a time determined by the examiner(s) in consultation with the student and, if the student so wishes, at the latest within a month after the request (the vacation period not being counted).

5.4.3 For each of the courses of the master's programme which are not published in an education timetable, the examiner who is charged by the Examination Committee with conducting the examination in such a course, determines, as far as possible in consultation with the student(s), a time when the examination can take place.

5.4.4 The examination for the courses which are taken as written examinations, can be taken at least twice per course year, once immediately after the period in which the teaching in that course is given, and once at such a time that there is a reasonable gap between two successive examination opportunities.

Examinations (oral and written) in courses for which the teaching is not offered every year can, at the request of a student, be taken at least once every academic year.

5.4.5 Every student has the right to complete every course of the relevant academic year, unless the student has been excluded from participation in the relevant education or examination. The student progress, the results of conditional tests, the score in one of the contributing courses or the absence from education activities or examinations for which one has registered, can in the extreme case be reasons for excluding a student from (further) participation.

5.4.6 The number of times that it is allowed to take part in a regular completion of a course is limited to two, unless otherwise indicated. Where the student wishes to participate in more than two attempts, permission from the Examination Committee is necessary. In this case the Examination Committee can also prescribe a different form of examination (oral, project).

Where a change of existing courses, or a substantial change of the material in a course, has been made which has been approved by the Director of Education, the student who has participated at least once in the examination of the relevant course before the changes were made has the right to be re-examined in the course in its old form at the first timetabled opportunity in the adjoining academic year.

5.4.7 Registering for but not taking an examination is regarded as an attempt at the examination for which a mark of 1 is awarded.

5.4.8 For each of the examinations the examiner charged by the Examination Committee with conducting this examination determines, after consultation with the student, a time when the examination can be taken. This can mean that examination can only be taken once per academic year.

5.4.9 In special cases and by student request, the Examination Committee or the relevant examiner can allow a deviation from the times fixed in article 5.4.3.

5.4.10 Concerning an examination that relates to a course which is not taught within the programme, the sequence and time periods in the education and examination regulations valid for that course are applicable, except for a deviating decision made by the Examination Committee.

5.5 Special provisions (Article 7.13 paragraph 2 subparagraph i, WHW)

Students with a physical or sensory limitation are given the opportunity to take examinations in a manner that is as far as possible adapted to their individual limitation. The facilities which are to be offered as far as possible consist of a form or duration of the examinations which matches the individual situation, or making practical aids available. For this purpose the student should hand in to the Education Affairs Office a written (e-mail) request at the start of the study or the start of the limitation. The Director of Education seeks, whenever necessary, expert advice before making a decision. The student is informed of the decision in writing.

5.6 Taking examinations

(Articles 7.10 and 7.12 paragraph 3, WHW)

5.6.1 Every examination consists of an inquiry into the knowledge, the insight and the skills of the student as well as the assessment of the results of that inquiry.

5.6.2 The assessment is made by one or more examiners.

5.6.3 In the case where the inquiry of the same examination is undertaken at the same time or not by more than one examiner and the result thereof is assessed, the relevant Examination Committee ensures that the examiners assess on the basis of the same standards. Where necessary it appoints an examiner who has the prime responsibility for the examining.

5.6.4 The determination whether the conditions for taking of the examination, or one or more components of it, are satisfied is taken by the relevant Examination Committee or examiner, who can delegate the implementation to the Education Affairs Office.

5.7 Exemption from examinations

(Article 7.13 paragraph 2 subparagraph n, WHW)

5.7.1 On the basis of examinations taken elsewhere with satisfactory results, exemption from an examination can be given. The Examination Committee decides about the granting of exemptions after it has received advice from the relevant teachers.

The exemptions from examinations stated in the previous paragraph are determined in a written decision.

5.7.2 A request for exemption from the requirements to take examinations or to participate in (practical) exercises (see 4.3) on the basis of what is determined by or in accordance with the [Dutch] law should be made to the Director of Education.

5.7.3 Having heard the relevant examiner(s), the Examination Committee decides within one month of having received the request.

5.7.4 The student has the opportunity to be heard before the Examination Committee decides to grant the exemption totally or in part.

5.7.5 Where, by or according to the [Dutch] law, the examinee has the right to exemption for one or more examinations, he informs the Education Affairs Office (BOZ), and provides the relevant pieces of evidence.

5.8 Oral examinations (Article 7.13 paragraph 2 sub-paragraph h, WHW)

5.8.1 The examiner can himself determine the form of examination within the frameworks which have been set.

5.8.2 The oral taking of an examination is not in public, unless the relevant Examination Committee or examiner has in special circumstances determined otherwise.

5.8.3 Members of the Examination Committee and the Director of Education are entitled to attend an oral examination session.

5.9 Written examinations

5.9.1 The questions and answers (examination scripts) of an examination do not go beyond the sources from which the material has been taken and what has been handled in lectures. These sources are published in outline before the start of the education that is given in preparation for the relevant examination. At the latest one month before taking the examination, the definite extent of the material is made known in writing (e-mail/Blackboard). The manner in which the examination is to be taken must be published at the moment that the registration period in '*OSIRIS Self Service*' is opened.

5.9.2 The times when the written examinations can be taken are published in the annual timetable (see 5.10.1).

5.9.3 The Examination Committee ensures that in good time the students can gain insight into the extent and complexities of the demands placed on the examinations. For a written examination, the students have well before the examination a concrete insight into the degree of difficulty and accents to be expected of the examination.

5.10 Registration for examinations / Conduct during examinations (Article 7.12, WHW)

5.10.1 The registration for examinations

a. Registration is required for written examinations.

The timetable states up to which day it is still possible to inscribe for the examinations of each separate semester. Bearing in mind the dates indicated in the previous sentence, inscribing for examinations should take place using the 'OSIRIS Self Service', unless otherwise informed.

Not registering in the stated manner before the closing date for inscription, cancels the right to participate in the relevant session. Even if participation is allowed by the relevant invigilator, this does not automatically confer the right of assessment of the work handed in.

b. A student who has registered for the examination and without valid reason does not appear can be excluded from participation in the next examination session of the relevant course.

c. Registration is required for the master's examination. The registration takes place at the Education Affairs Office (BOZ) (see Appendix 1).

5.10.2 Conduct during an examination

a. One or more invigilators are appointed to a written examination, who ensure that the taking of the examination runs smoothly. The student should take the examination at the designated place.
b. The student can only take part in an examination if, when asked, he can establish his identity with a document of registration as student or otherwise.
c. The student is considered to take part in a written examination, when he has taken receipt of the examination paper.
d. In connection with quietness during the session, the student is required to be present before the start of the session and on entry where applicable to switch off and put away communications apparatus. On late arrival, more than 15 minutes, the invigilator can refuse him participation in the written examination. The invigilator makes out a formal report about this.
e. Over-garments and bags remain as far as possible outside the room or at the front of the room at a place so designated by the invigilator.
f. Having communications apparatus within reach is not allowed, unless otherwise indicated.
g. Writing materials are allowed; the teacher can indicate which other aids are allowed, for example, a reader, book, pocket calculator, etc.
h. The permission of the invigilator is required for a visit to the toilet; study materials, communications apparatus, and other (portable) study aids should be left behind in the examination room.
i. The student who has satisfied point c. should at the end hand in to the invigilator the examination work he has done.

j. A student who wishes to leave the examination session early after 30 minutes after the start, should tell the invigilator. He should then hand in the examination work, even if he has not made a start with answering the questions.
k. Instructions by the invigilator should be followed precisely.

5.11 Fraud (Article 7.12 paragraph 4, WHW)

5.11.1 Fraud is understood to mean:

1. The use in examinations of more or different aids than those which the examiner, before the examination, has stated in writing that they are allowed.
2. The use in examinations of aids or help which the student knew or should have known that they were not allowed. In any case the following are included among the intended help or aids mentioned in the previous sentence:
   a. Cheating, whether or not:
      - With the aid of cheating notes, other means of help, previously prepared workings out, and/or communications apparatus;
      - Through copying or allowing copying, in examinations;
      - Making contact with others (other than the invigilator or teacher) about the material of the examination during the time for sitting the examination and when the work has not yet been handed in.
      - Through making use of parts of written work or worked out answers of others.
   b. Forgery of documents, including doing or allowing the doing of an examination under a false name.
3. Behaviour of students which, before the taking of the examination, the teacher has made it known in writing that he regards it as fraudulent.
4. Plagiarism: copying without proper reference to sources and allowing copying.

Appendix 5 provides further details of which procedures are to be applied for handling written work which is considered fraudulent.

5.11.2 Where (suspected) fraud is perceived, the responsible teacher informs the student involved and the Examination Committee in writing (e-mail).

5.11.3 After determining fraud, the teacher takes the following action(s) concerning the student:

a. The assessment of the complete examination is a mark 1 (one).

This also holds for fraud in a part of an examination.

b. Exclusion from participation in the relevant examination for a period of at most one year.

c. The examiner can determine for the student involved a deviating form of assessment of the relevant examination.

5.11.4 The Examination Committee is entitled to impose additional actions on the student.

a. When the Examination Committee determines that there was fraud, it can exclude the student(s) involved for a period of at most one year from participation in, in the extreme case <u>all</u> examinations.
b. b. An examination for which in whatever way fraud has been confirmed may not, during the period of exclusion, be replaced by another examination.

5.11.5 Article 6.7 is applicable for what concerns objection and appeal against a decision which is taken in the framework of articles 5.11.3 and 5.11.4.

6. RESULTS

6.1 Transcript of examination result (Article 7.11 paragraph 1, WHW)

6.1.1 After an examination has been taken, the examiner draws up a declaration from which the result or results are apparent. The declaration is signed by the examiner.

6.2 Assessment (Article 7.12 paragraph 4, WHW)

6.2.1 The assessments are usually expressed in the form of one of the following **integer** marks 1 to 10 inclusive. The marks have the following meanings:

1: very poor	2: poor	3: very unsatisfactory
4: unsatisfactory	5: almost satisfactory	6: satisfactory (pass)
7: very satisfactory	8: good	9: very good
		10:excellent

Examinations can be assessed with a 'V' (voldoende = sufficient) where in the judgement of the examiner(s) at least a reasonable achievement is handed in. On the marks list an exemption is indicated by 'Vr' (vrijstelling).

6.2.2 Where the student has been assessed more than once for the same examination, the highest mark is the valid one.

6.3 Approval, publication and registration of results of an examination

(Article 7.13 paragraphe 2 sub-paragraphe k, WHW)

6.3.1 After the end of an oral examination, the assessment is confirmed within one week and published to the student.

6.3.2 Within 20 working days (not counting the academic vacations) after the end of a written examination, after the handing in of a project or after the finishing of a practical, the result of it is published. Where there is the opportunity of a quick re-examination for the relevant course, the checking time is shortened to such an extent that the student can reasonably prepare for the re-examination.

6.3.3 If the period stated in 6.3.2 is exceeded, the Examination Committee can in the most extreme case determine or allow the determination of the result of an examination.

6.3.4 The results of written examinations, projects and practicals are published in 'OSIRIS'. Where there is lack of clarity about the result, the declaration countersigned by the examiner is the valid result.

6.3.5 Errors in overviews

Where a mistake has been made in a marks list or an overview which relates to the study progress of a student, both the programme and the student are required to make it known to the other party as soon as it is discovered, and to work together to annul the mistake that has been made. The administration of the programme discloses complete information unless indicated to the contrary. When there is evidence to the contrary, in every case the examination work assessed by the teacher is valid.

6.3.6 The Education Affairs Office (BOZ) ensures the registration of the assessments and the results of the examinations.

6.3.7 The Examination Committee can give information about registered data to authorised persons, such as:

- Members of the programme management;
- Members of the assessment committee;
- Those persons who are charged with activities such as making requests for financial support, dealing with the study grant (DUO = Dienst Uitvoering Onderwijs ("IB-Groep = Information Management Group, Informatie Beheer Groep " previously)), and the central administration for students and alumni.

The information disclosed is limited to what is essential for the purpose.

6.4 Duration of validity of assessments (Article 7.13 paragraph 2 subparagraph g, WHW)

6.4.1 The results of examinations which have been taken are valid without time restriction. In deviation from this, for a course for which the examination was passed more than six years beforehand, the Examination Committee can impose an additional or resit of the examination.

6.4.2 In special circumstances the Examination Committee can extend the duration of validity of assessments stated in the previous paragraph by a period the length of which it determines.

6.5 Right of inspection (Article 7.13 paragraph 2 subparagraph l, WHW)

6.5.1 During a period of four months which begins on the day after the result of a written examination is made known to the participant, the student can at his request inspect his own assessed examination work and scripts.

Concerning reports of a practical, the same agreement is applicable for the inspection of own work. The leader of the practical determines:

a. whether, after the stated period of four months, the reports can be given back to the students involved and
b. whether copies may be made of the assessed reports.

The intended inspection occurs at a time and place determined by the examiner in consultation with the interested party.

6.5.2 Storage time for examinations

The assessed examination work produced by the students on paper should be stored for at least one year under the responsibility of the Examination Committee. Where an examiner is appointed for the course involved, he is responsible for this.

6.6 Subsequent discussion (Article 7.13 paragraph 2 sub-paragraph m, WHW)

6.6.1 Without prejudice to what is determined in article 6.5, an individual subsequent discussion of the work takes place with the examiner if the student requests it. This request must be made within a period of two months after the result of the examination has been published.

6.6.2 Where a joint subsequent discussion is organised, a student can submit a request as intended in the previous paragraph, when he has been present at the joint discussion and gives his reasons for his request.

6.7 Difference of meaning / Right of Appeal

6.7.1 Where there is a difference of meaning about a decision which has been taken, the relevant examiner and the student try to reach an agreement during the subsequent discussion. See also article 10.2.3.

6.7.2 Where the student is not provided with this opportunity, or the discussion does not lead to a result which satisfies both parties, a written (e-mail) appeal can be made to the Examination Committee within two weeks against the treatment. The Examination Committee will take a decision about it within three weeks and will inform those involved about it.

6.7.3 The joint right of complaint of students (Article 9.28, WHW)

Method of implementation

a. The joint right of complaint can be used where the obligations of the university (in this case the programme) towards students are not met, or not completely met, or not met to a sufficient extent.
b. The right intended in the first paragraph can be used by a group of students who are registered for the same programme at the University of Twente.
c. The named group of students appoints from among them one or more spokesperson(s).
d. The complaint is submitted in writing (e-mail) to the Director of Education by or on behalf of the spokesperson(s) stated in c. This consists of a clear description of the objections and what, according to the applicants, must be done to overcome the objections.
e. The Director of Education confirms receipt to the spokesperson(s) within seven days of having received the complaint, and provides the applicants with the opportunity to give clarification of it within a reasonable period of time.
f. Within six weeks of having received the complaint, the Director of Education informs the spokesperson(s) of the applicants in writing and with reasons, whether the complaint is a reason for him to take actions and, if this is the case, what actions they are.
g. Where the complaint relates to an issue which does not fall under the authority of the Director of Education, the Director of Education forwards the complaint to the authorised body or the authorised official. The Director of Education informs the spokesperson(s) of the applicants of the complaint about this. What is stated in e. and f. is applicable in this case.

6.7.4 Appeal to the Appeals Tribunal for Examinations is possible against the decision of the Examination Board or examiners as intended in Article 7.61, WHW. The period for submission of the (written) appeal is four weeks (Article 7.61, paragraph 3, WHW).

7. GRADUATION EXAMINATION

7.1 Approval of the results of the examinations (Article 7.10 paragraph 2, WHW)

7.1.1 After all components of a graduation examination have been taken, the Examination Board involved can determine whether the student has satisfied the conditions stated in Appendix 1 for passing, or not. Where this is indeed the case, the Examination Committee can declare the student to have passed, and can carry out (or have carried out) all the relevant procedures which follow.

7.1.2 Moreover, where the guidelines stated in Appendix 3 for the award of the designation 'with distinction' ('met lof') have been satisfied, the Examination Committee is empowered to allow this designation to be used on the master's degree certificate.

7.2 Degree certificates and registration (Article 7.11, WHW)

7.2.1 To show that the Master's examination has been successfully completed, a degree certificate is awarded by the Examination Committee. The degree certificate is countersigned by the persons stated in Appendix 4. The award takes place in public; in special circumstances the Examination Committee can deviate from this.

7.2.2 An English language diploma/degree supplement and/or marks list, on which the results of the examinations are stated, is provided to all those examined.

7.2.3 'Extra courses' are stated where applicable, provided these were added to the study programme with the approval of the Director of Education. The stated 'extra courses' make no part of the total programme. These courses should have been satisfactorily completed.

8. QUALITY ASSURANCE

The Director of Education is responsible for the design and implementation of a systematic procedure for evaluating (the parts of) the programme, in particular for the elements 'quality' and 'feasibility' ('studeerbaarheid'[11]).

9. FACILITIES (Article 7.59 paragraphe 4 sub-paragraphe a2, WHW)

9.1 Computer provisions / Computer rooms

9.1.1 It is a requirement for following education that sustainable energy technology students have a notebook available which supports the hardware and software. Students with questions about software can make use of the 'Helpdesk/Notebook Service Centre'. Students can also go there for breakdowns of notebooks which were selected by the NSC.

9.1.2 Every student has his own e-mail address which is assigned to him at the beginning of the UT study. Electronic communication between the UT and students occurs exclusively via this e-mail address.

9.1.3 Within the programme, copying and printing facilities are available for students (at their cost).

9.1.4 Misuse of or damage to UT facilities (use of computer provisions and network provisions for non-study purposes) or misconduct can, in addition to paying for the damage, be a reason for the management team temporarily to refuse the student participation in teaching and the examinations.

9.1.5 Use of the computer provisions and network provisions for non-study purposes can be regarded as misuse.

[11] Translator's note: a good English translation of the compact Dutch word 'studeerbaarheid' is notoriously difficult: 'feasibility', 'do-ability' and 'learn-ability' are all used. The essence is whether a suitably-qualified diligent student can successfully master the required academic material within a defined time. The criteria applied in the master ME are: the students in average should be able to pass the exam with the mark 7 by spending the allotted time.

9.2 Library

The central UT library contains an abundance of books and periodicals relevant to the sustainable energy technology programme. In addition some study materials are available in the room of the Isaac Newton Student Association .

9.3 Studyspace

The study spaces in the centre of the Horst building in front of the lecture room C.101, the canteen and the student area in the basement are designated as the Educafé. Outside the lunch time, the canteen is intended for study and consultation, wherein persons should follow the local/domestic rules, including the return on time of canteen-ware. Study material can be loaned via the Isaac Newton Student Association.

Study rooms (several vacant project rooms in the Horst Tower) are available for occasional use for the benefit of students within the programme. These rooms can be reserved: for this purpose consult first on the internet the relevant room timetable for East Horst (OH) and Horst Tower (HT) IO/WB.

9.3.1 A room can be booked via

http://www.utwente.nl/onderwijssystemen/en/about_the_applications/timetabling_systems/WRB/

10. CONDITIONS FOR IMPLEMENTATION AND FINAL CONDITION

10.1 Assessment and approval of this regulation

10.1.1 Having heard the Faculty Council (FR-ET) and the Education Committee (OLC-SET), the Dean approves this regulation.

10.1.2 The Dean and the Education Committee assess this regulation regularly in the context of its implementation and its effectiveness.

10.2 Changes to this regulation

10.2.1 Changes to this regulation are approved by separate decision of the Dean.

10.2.2 Changes which are applicable to the current academic year can only be effected where the interests of the students are not thereby reasonably damaged.

10.2.3 In cases not covered by this regulation, the Examination Committee decides. This is also the case for (apparent) lack of clarity, inconsistencies, differences of interpretation and/or (apparently) conflicting texts.

In cases which this regulation does cover, the Examination Committee can in special circumstances also decide otherwise, provided this is not to the disadvantage of the student. It informs the involved teacher, Examination Committee and/or student of the decision.

10.3 Appendices

The Appendices mentioned in the previous articles are an integral part of this regulation.

10.4 Publication

The Director of Education arranges for publication of this regulation and any changes to it which may be approved at a later time. In any case these are made available to the target group via Internet or at the Education Affairs Office.

10.5 Final Condition

10.5.1 This regulation comes into force on 1 September 2017.

10.5.2 This regulation can be quoted as 'Education and Examination Regulations for Sustainable Energy Technology.

APPENDIX 1: MANUAL MASTER THESIS SET

Manual master thesis
Sustainable Energy Technology

June 2017

G.G.M. Stoffels, programme coordinator SET
J.B.W. Kok, director of education SET

1. Introduction

In 2003, the three Dutch Universities of Technology (TUD, TU/e and UT) embarked on a cooperation directed towards the harmonization and coordination of research and educational efforts. The Master's programme in Sustainable Energy Technology (SET) was one of these five new programmes. The three Universities of Technology are in a good position to offer a research-oriented Master's programme, as required by the energy sector. Since 2003 the programs of the three universities are each developed from their own strength and vision, Registration at one location automatically includes registration at the other two.

The two-year English-taught Master's programme Sustainable Energy Technology (SET) at the University of Twente invites students to gain in-depth understanding of (energy) technology and engineering and to supplement that with knowledge and skills related to entrepreneurship and innovation. Building on this broad foundation, SET engineers will rise above technology per se to play a role as enabler, leader and game changer in the transition towards sustainable energy systems. The energy challenges that are faced today call for professionals who are as skilful in engineering as they are in business development and innovation. The SET programme will prepare engineers for this broader, more entrepreneurial role. Students will be trained in chemical, electrical, process and mechanical engineering, as well as economics, business development, innovation, supply chain management and societal change. The programme is research-driven, research in this field is of high importance and it is at a high level at the UT.

The SET programme consists of 120 European Credits (EC) according to Table 1.

Regular SET Track	**EC**	**Bioresource Value Chain Management Track**	**EC**
Core programme (first year)	60	Core programme (first year)	60
Specialisation-linked elective subjects	15	Bioresources characteristics & properties courses	15
Internship / elective subjects	15	Bioresources value chain courses	15
Master's thesis	30	Master's thesis	30
Total	**120**	**Total**	**120**

Table 1: Programme setup SET at the UT

The first year consist of 12 compulsorily courses (60 EC) that provide the student a broad foundation with elements from technology as well as from entrepreneurship and innovation. This combination of knowledge is covered in a well-balanced programme. The core programme of 60 EC in the first year is made up of courses related to four themes

1. Energy sources
2. Technology and sustainability
3. Socio-economics
4. Design and system integration.

In the second and final year the student can complete the regular SET track or pursue the unique track, Bioresource Value Chain Management (BVM). Whichever a student chooses, he will become an authority in implementing technology-driven change in energy markets worldwide.

- The Regular track consists of elective courses (15 EC), an internship[12] (15 EC) and a master assignment (thesis).
- The Bioresource Value Chain Management track consists of courses on Bioresources characteristics & properties (15 EC), Bioresources value chain (15 EC) and a master assignment (thesis).

[12] Bachelors entering from a university of professional education (HBO) who have considerable industrial experience are not allowed to do an internship (stage). Instead of an internship they should follow 15 ec master courses

For the regular SET track elective courses in the second year give students the possibility to acquire in-depth knowledge to effectively carry out a Master's thesis project in one of the research areas of sustainable energy technology. For the Bioresource Value Chain Management track courses related to bioresources provide in-depth knowledge to perform a project in the field of Bioresource Value Chain Management.

The Master assignment (thesis) in both tracks takes 30 EC, which agrees with the duration of 2 quarters of 10 weeks of 42 hours. This individual master's assignment is the completion of the master's program. The main objective of the Master assignment is that the student learns and proves that (s)he is able to define, perform, complete and reflect a research project at a large degree of independence. During the master's thesis work, a student proves his level of understanding and ability to carry out a scientific research or design project, using the acquired competences, i.e. knowledge, skills and attitude. The assignment, containing social as well as technological aspects, is performed in one of the energy related research chairs of the UT under the supervision of a daily supervisor and the responsibility of a chair holder (graduation professor) and a master's graduation committee. Conditionally, the assignment can be done (partially) at an external institute or organization.

This manual gives important information about the general rules for doing the Sustainable Energy Technology master thesis at the University of Twente (UT).

2. Getting started

2.1 Selecting a topic and a research group

The first step to take to get started with the master thesis research is to select the track (Regular or Bioresource Value Chain Management track), the topic and the research group. We advise you to do this at the end of the first year of the programme. This gives you time to think about the (elective) courses in the second year that you need to acquire the in-depth knowledge. In case you choose the regular track you can select a topic from the large offer of the University of Twente. For examples of thesis topics, you can visit our website at www.utwente.nl/set. If you have another idea about a thesis topic related to sustainable energy technology, this is also possible. Examples for areas for the thesis topic are:

- Electrical power engineering
- Energy and society
- Energy from biomass
- Energy storage
- Fuel cells
- Hydrogen technology
- Solar energy
- Sustainable energy in the built environment
- Wind energy

The MSc.-assignment has to take place in one of the chairs of the university that is involved in sustainable energy related research. An external assignment is only possible by exception, to be judged by the Exam Committee. In case of an external assignment, a UT-chair professor has to take the responsibility for the assignment and should officiate as the professor in the MSc.- graduation committee.

2.2 Elective courses (regular track only)

When you have found a research topic and a research group, including a supervisor, you make a list of elective courses for your in-depth knowledge and fill it in in the "Study Programme form". You do this together with your supervisor who will help you. This list needs the approval of both the chair holder of your supervisor and the director of education of SET. You can find this list on the website www.utwente.nl/set and in Annex 1.

2.3 Approval thesis topic and appointment MSc. graduation committee

Next, you need the approval of your thesis topic. For this you fill in the form "Approval form Master Assignment Sustainable Energy Technology". See Annex 2 and the form on the website. Next, the professor of the chair forms your graduation committee. It includes at least three scientists with a different background related to the topic of research. The committee includes:

- A chairman: the professor of the chair in which the student graduates or a representative (professor or UHD);
- The daily supervisor, who is a member of the permanent scientific staff (professor, UD or UHD);
- A member of the permanent scientific staff of a UT-chair different from the graduation chair (professor, UD or UHD). This member is added to committee to:
    i. ensure that committees assess MSc.-assignments objectively;
    ii. add additional knowledge and views from other scientific fields;
    iii. exchange ideas between chairs.

When the supervisor is a PhD-student, then preferably the staff member who is the supervisor of the PhD-student should be added to the committee. He can monitor the interests of the master student concerned. Scientific experts from outside the programme in which the assignment takes place may be part of the MSc. Graduation committee in addition to the above group of three persons.

The establishment of this interdisciplinary committee makes it possible to guide the student effectively through the process and judge the Master's thesis from different perspectives. Moreover, the composition of the committees contributes to equal standards across different committees. You give the members of het committee on the form. The form needs the approval of the director of education.

2.4 Agreements with the research group

The student has to perform a substantial research or design project that meets scientific criteria. The level of profundity and complexity is defined by the chairman of the MSc. graduation committee, the chair holder of the research group. The SET student adds to the research topic of the selected research group the broad perspective of Sustainable Energy Technology.

When you have found your thesis topic and research group, you make agreements with this group. The chair holder of the group, the graduation professor, is responsible for the thesis work. Often, you will have one daily supervisor, sometimes more, who are not necessarily a professor. However, the chair holder has the final responsibility. Before getting started with the actual thesis work, the student and his or her supervisors make a time table of when to get started, end day and deliverables during the thesis work. Also there are agreements about the supervision, who is doing what, and the intensity of supervision. When the actual thesis work is done outside the UT, the research group assigns a supervisor in the outside organization. The UT supervisor and chair holder remain responsible for the content and scientific level of the thesis work. Moreover, they are responsible that the work can be finished within the time given to do the work. The student completes the assignment with a written report (the MSc.-thesis) an oral public presentation and a defense.

The research group pays a limited number of hard copies of the master thesis. These copies are distributed among the members of the graduate committee and the secretary of the research group at least two weeks before the final defense. A digital version in PDF format needs to be send to BOZ-WB (BOZ-WB-CES@utwente.nl).

3. Administrative formalities

The following administrative formalities are needed:

- Approval of the list of courses, including elective courses (*see form Annex 1*);
- Approval of the research topic (*see form Annex 2*);

- Approval of the graduation committee (*see form Annex 2*);
- Documentation of agreements with the research group;
- Inform BOZ-WB about the starting date, research group and location. As soon as you have found a thesis assignment, you are *obliged* to register this in Mobility Online. You can register by creating a new assignment called 'Graduation' ("Afstuderen") and filling in a so-called 'Assignment' form ('Opdracht'). Print the form, get a signature for approval from your graduation professor and hand the form over to BOZ-WB (Or: Send the signed form as a pdf to BOZ-WB-CES@utwente.nl);
- Within two weeks after you started with your thesis work you are *obliged* to fill in a so-called 'Notification' form ('Melding');
- Agreements about finishing courses. All courses need to be finished before the master thesis can be finalized!
- Assessment of working hours with the research group;
- Agreements with the supervisors about the evaluation meetings;
- Information of supervisor in case of problems during the trajectory;
- Information of BOZ-WB in case of temporarily delay, e.g. in case of illness, holiday, exams, etc.;
- Hard copies two weeks before the defense to committee and secretary group, digital copy to BOZ-WB (BOZ-WB-CES@utwente.nl).

In case of disagreement, the director of education of SET can provide assistance.

4. Assessment

The assessment of the master thesis is based on the interdisciplinary analyzing capacity, creativity, self-reliance, written report, oral presentation of 45 minutes (including question round) and discussion for a broad audience and the separate, final one hour defense for the graduation committee. The assessment criteria are given in Table 2, the assessment checklist.

Table 2. Assessment Checklist MSc.-thesis SET

Assessment research qualities	
• Problem analysis: o Definition of the research goals and research questions, o Use of relevant scientific literature, o Applying a multidiscipenary framework to put the problem in the proper energy related context • Execution of the MSc.-assignment: o Application of research methodology, o Theoretical skills, o Experimental skills, • Analysis of the results: o Application of data analysis, o Complexity of the research, o Feedback to the research goals, • Accessibility and usefulness of the results: o The most important indicator is the degree of publishability[13] the results.	
Assessment of the reporting and general aspects	
• Report (thesis): o Contents and structure, o Design and lay-out, o Language, o Discussion of results, conclusions and recommendations, o Literature references, list of symbols, description of laboratory set-up, etc. • Colloquium: o Contents, o Message, and connection to public[14], o Explanation about methods and results (clearness), o Style of presenting and use of audio-video support tools, o Discussion and response to questions. • General aspects: o Independence of student, o Originality and creativity, o Attitude, effort, pace, dedication, commitment, o Co-operation with "problem owner" and with co-workers.	

[13] Degrees of publishability: independent article by student / with additional results / as a part of other work / non-publishable.

All committee members make an individual assessment of the final grade based on the criteria of Table 2. Based on these grades, the chair proposes the final grade.

5. Procedure

5.1 Announcement of colloquium

The announcement of the colloquium is arranged by the secretary of the research group where you did the thesis work. The colloquium room is also arranged by the secretary. Next, you inform BOZ-WB as well as the secretary of SET (S.Y. Kloost-Zimmerman van Woesik) who take care of the announcement of the colloquium.

The student notifies BOZ-WB at least 4 weeks (20 working days) before the colloquium using the form 'Aanmelden masterdiploma' (registration master certificate). And the form 'colloquiumformulier' signed by the daily supervisor.

5.2 Graduation

The certificate of the master SET is given when the following constraints are met:

- The student has completed all courses and fulfilled all requirements of the master programme SET. This is controlled by BOZ-WB when they have received the notification. Next, BOZ-WB informs CSA (Central Student Administration)
- The grades of all courses, apart from the master thesis, need to be registered at BOZ-WB at least 3 weeks before the graduation.
- The student is registered at the UT the day of the graduation. This is controlled by CSA.
- The student sends a digital version of the thesis to BOZ-WB at least 1 week before the graduation.

When the constraints above are met, the student is allowed to do the final exam, i.e. colloquium and defense. When this is done successfully, the certificate, signed by the chair of the Exam committee of SET-ME, as well as by the chair of the committee is given to the student. The student also receives the grades list.

All forms can be downloaded at: www.utwente.nl/set.
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Annex 1

2017-2018 Master study programme Sustainable Energy Technology

Regular Track

NAME STUDENT: **STUDENT NO:**

SPECIALISATION:

GRADUTION PROFESSOR:

Compulsory subjects: (60 EC)		Credits:	
THEME 1: ENERGY SOURCES (15 EC)			
201700023	Energy from Biomass (Q2) - Brem / Bramer	5,0	EC
201700024	Wind Energy (Q4) - Venner	5,0	EC
201700025	Solar Energy (Q3) - Reinders	5,0	EC
THEME 2: TECHNOLOGY AND SUSTAINABILITY (15 EC)			
201600019	Energy Conversion Technology (Q1) - Brem / Pozarlik	5,0	EC
201600252	Energy Storage (Q3) – Brem / Mul	5,0	EC
191102010	Life-Cycle Strategy (Q1) - Toxopeus	5,0	EC
THEME 3: SOCIO-ECONOMICS (15 EC)			
201700029	Energy, Sustainability and Society (Q3) - Arentsen	5,0	EC
201700030	System Innovation and Strategic Niche Management (Q4) - Coenen	5,0	EC
201500448	Designing Business Models (Q4) - Gelhard / Henseler	5,0	EC
THEME 4: DESIGN AND SYSTEM INTEGRATION (15 EC)			
201700026	Electrical Power Engineering and System Integration (Q2) - Dhalle	5,0	EC
192850840	Sources of Innovation (Q1) - Reinders	5,0	EC
193735010	Thermodynamics and Flowsheeting (Q2) – v/d Ham	5,0	EC
		60,0	**EC**

Internship or elective subjects (15 EC)			
			EC
			EC
			EC
195799152	Internship (15 EC)		EC
		0,0	**EC**

Specialization subjects (15 EC)			
			EC
			EC
			EC
			EC
		0,0	**EC**

Graduate (30 EC)			
201700027	Master assignment (30 EC)	30,0	EC
		30,0	**EC**
	Total master programme at least 120 EC:	**90,0**	**EC**

Additional subjects (beyond the 120 EC)

		EC
		EC
		EC

Approve of:

Graduation Professor:	Student:	Director of Education SET
date	date	date

2017-2018 Master study programme Sustainable Energy Technology

Bioresource Value Chain Management Track

NAME STUDENT: **STUDENT NO:**

SPECIALISATION:

GRADUTION PROFESSOR:

Compulsory subjects: (60 EC)		Credits:	
THEME 1: ENERGY SOURCES (15 EC)			
201700023	Energy from Biomass (Q2) - Brem / Bramer	5,0	EC
201700024	Wind Energy (Q4) - Venner	5,0	EC
201700025	Solar Energy (Q3) - Reinders	5,0	EC
THEME 2: TECHNOLOGY AND SUSTAINABILITY (15 EC)			
201600019	Energy Conversion Technology (Q1) - Brem / Pozarlik	5,0	EC
201600252	Energy Storage (Q3) – Brem / Mul	5,0	EC
191102010	Life-Cycle Strategy (Q1) - Toxopeus	5,0	EC
THEME 3: SOCIO-ECONOMICS (15 EC)			
201700029	Energy, Sustainability and Society (Q3) - Arentsen	5,0	EC
201700030	System Innovation and Strategic Niche Management (Q4) - Coenen	5,0	EC
201500448	Designing Business Models (Q4) - Gelhard / Henseler	5,0	EC
THEME 4: DESIGN AND SYSTEM INTEGRATION (15 EC)			
201700026	Electrical Power Engineering and System Integration (Q2) - Dhalle	5,0	EC
192850840	Sources of Innovation (Q1) - Reinders	5,0	EC
193735010	Thermodynamics and Flowsheeting (Q2) – v/d Ham	5,0	EC
		60,0	**EC**

Bioresources courses (30 EC)			
			EC
			EC
			EC
			EC
			EC
			EC
			EC
		0,0	**EC**

Graduate (30 EC)			
201700027	Master assignment (30 EC)	30,0	EC
		30,0	**EC**
	Total master programme at least 120 EC:	**90,0**	**EC**

Additional subjects (beyond the 120 EC)

		EC
		EC
		EC

Approve of:

Graduation Professor:	Student:	Director of Education SET
date	date	date

Annex 2

Approval form Master Assignment Sustainable Energy Technology

Student name	Student number

Track/specialisation	Research group	Date

Title thesis

Members graduation committee	
Name	
Chair	
Supervisor	
Member other group	
Other members	

Abstract research proposal including 5 keywords (max 600 words)

Approval

J.B.W. Kok, director of education Sustainable Energy technology (SET)

MASTER'S EXAM:

Name :
Student number :
Master's track :
Graduation professor :
Master's programme : attached
Date master's examination :

Oral presentation : _____

Report : _____

Defense : _____

The graduation committee hereby states that
The status of the final report will be*:
O = "**Confidential**" (for a period of _ years)
O = "**Public**"
*) *tick the appropriate box*

M-assignment (content) : _____

M-assignment (process) : _____

FINAL GRADE : _____ *RESULT* : _____

Graduation committee: *Signature:*

Prof.dr.ir. XX _____

Dr.ir. YY _____

Prof.dr.ir. ZZ _____

Criterion	Motivation (What went well, What could have been improved)
Oral Presentation	
Report	
Defence	
Content (quality of research or design)	
Working process during project	

Aspects for assessment

1) With respect to content; quality of research / design
- insight in subject matter
- depth (detailed elaborations, use of literature)
- insight in coherence between different parts of the research project
- reasoning / argumentation of conclusions (are research questions clearly stated and answered?)
- relevance (scientifically, but also applicability in practice) (being able to put research into its context)
- creativity / inventiveness: extent to which the student independently introduces new concepts
- extent to which the research contributes to new knowledge / contributes to a concrete product, design or model
- learning (quality and quantity)

2) Report
- composition, structure
- consistency
- clarity/sharpness of formulations
- readability
- editing, lay out
- images and tables (usefulness, added value)
- references to literature

3) Working process during master thesis project
- attitude
- independence
- commitment/enthusiasm
- cooperation
- communication skills
- incorporation of feedback
- functioning within the organisation where the project is carried out
- student's attitude during progress meetings (active / passive)
- the extent to which the original research proposal has been met and reasons for alterations (keeping up with a work planning, follow up on appointments made)
- time needed to finish master thesis

4) Oral Presentation and defence
- content (what is included / not included in the presentation; is the message coming across?)
- structure / outline presentation
- care of details / neatness
- captivating way of presenting (verbal capabilities, posture)

5) Defence
- insight in subject matter and its relation with adjacent subjects
- answering questions / discussion
- ability to interpret/understand/analyse questions

Profiles for final grading

5. insufficient
The research and / or report are insufficient and the student was strongly directed by his or her supervisors. Weak points can clearly be pointed out. The student did not show an academic attitude. On average, the student scores ‘insufficient’ on all aspects for assessment.

6: sufficient
With respect to content, the research was conducted sufficiently. The report is mediocre. Weak points can clearly be pointed out, but are compensated by aspects on which the student performs better. The student has shown little input of his own and was strongly directed by his or her supervisors. On average, the student scores ‘sufficient’ on all aspects for assessment.

7: amply sufficient
With respect to content, a solid piece of research was delivered. The report is carefully edited. Either the research process or the mastery of subject matter leaves room for improvement.
The supervisors clearly had a steering influence on the final product. The student scores at least ‘sufficient’ on all aspects for assessment and ‘good’ on some aspects.

8: good
With respect to content, the research was set up in a solid way and was carried out accurately. The report is carefully edited regarding language, structure as well as lay out with minimal input of the supervisors. The student has worked independently and was able to put forward his or her own initiatives. Guidance given by the supervisors was minimal. On average, the student scores ‘good’ on all aspects for assessment.

9: very good
The research is innovative and can be converted to an article for a renowned (scientific) magazine or a conference proceedings without putting in too much effort. With respect to content, the research is very solid with some points that can clearly be pointed out as very good. The report is carefully edited and shows that the student disposes of very good writing skills. The student’s own input and independence are large. The student clearly stands above subject matter and is able to defend his or her statements in discussions well. The student scores at least ‘good’ on all aspects for assessment and ‘very good’ on some aspects.

10: excellent
The student functions at the level of an expert in the field. With respect to content, the research is excellent. The student is very capable of conducting research independently. The report and the presentation show that the student disposes of excellent communication skills (written and oral). The student scores at least ‘very good’

APPENDIX 2: COLLABORATION WITHIN 4TU

3TU bijlage OER SET TUD, UT, TU/e

1. The Master's degree program in Sustainable Energy Technology is a 3TU MSc program. The program is offered at TU/e (Eindhoven University of Technology), TUD (Delft University of Technology) and UT (University of Twente). The programs have similar learning objectives. The courses and specializations at each university are different. Each program has a different Croho number (program registration according to the WHW).

2. After a student is formally enrolled in the Master's program in Sustainable Energy Technology at one of the 3 universities he will also obtain a secondary enrollment (neveninschrijving) at the 2 other universities.

3. Students are allowed to choose elective subjects from the lists of elective/specialization and core courses from each of the 3 programs, after consultation with the mentor/supervisor from the home university and after approval by the Examination Committee of the home university.

APPENDIX 3: GUIDELINES FOR PASSING AND FOR AWARDING THE DESIGNATION 'WITH DISTINCTION' ('MET LOF')

When, beforehand, there is in the judgement of the Graduation Committee an exceptional level of student achievement and the prove of the student's potential as an exemplary academic engineer, the Examination Committee can submit a reasoned proposal to the Director of Education to affix to the master's degree the designation 'with distinction' ('met lof').

This must be requested two weeks beforehand, in order that the degree certificate 'with distinction' can be awarded immediately after the end of the examination. Where there is uncertainty about the award, a degree declaration can be handed over, and the degree certificate (with or without 'with distinction') can be received at the Education Affairs Office within two weeks after the examination.

Apart from the 'exceptional level and potential' the guidelines for passing 'with distinction' are:

a. The final mark for the master's project is at least a 9;
b. The unweighted averaged mark of all courses, exclusive of the Master's project, must be at least: 8.00;
c. The assessments of all examinations of the master's courses, including extra courses, are satisfactory ('Vr', 'V' or a grade higher than 6);
d. A mark of 6 is gained not more than once in the programme (extra courses are not counted);
e. The master's examination should have been taken within the nominal study time, augmented where applicable with recognised awards for graduation support, with a maximum over-run of two years. The nominal time is two years for BSc's or two years plus the extent of the premaster's courses less the exemptions within the master's programme for HBO-bachelors[15]).

Where these conditions are not completely satisfied, the chairman of the Graduation Committee of the student involved can still submit a proposal to the Examination Committee for the award of the designation 'with distinction'. This Examination Committee makes a decision.

[15] Bachelors from a university of professional education ('hogeschool')

APPENDIX 4: AUTHORITY FOR SIGNING DEGREE CERTIFICATES AND STATEMENTS

Master's degrees

These are signed beforehand by the chairman of the Board and after the examination by the graduation professor and the successful candidate. Examination

When no degree can be awarded after the assessment of the graduation project, the degree certificate is signed at the appropriate time by the graduation professor and the Director of Education. The successful candidate signs the degree certificate after he has received it from the Education Affairs Office.

In the absence of one of the members of UT mentioned above, the following regulation applies:

- The degree certificate should be signed by at least one member of the Examination Committee.
- The Examination Board gives the Director of Education the authority to be the second signer.

APPENDIX 5: ADDITIONAL DESCRIPTION OF THE CONCEPT OF 'FRAUD' IN WRITTEN WORK

The following rules apply in preparing written work, programming assignments and the like:

1. Individual written work

There is one author who obtains an individual assessment on the basis of his own written work. (it is considered fraud when a student did not write the work himself). Where passages are included, or data are used, which are taken from the work of others, it must be clearly stated:

- which passages they are (for example, by putting them *in italics* or within 'quotation marks')
- where they come from (by giving a clear source reference: a formal reference to the literature or a phrase such as '… oral information from Mrs XX').

2. 'Individual' group written work

Different members of the group are responsible for different parts of the report.

- indicate clearly which member of the group is responsible for which part of the report;
- where passages are included, or data are used, which are taken from the work of other members of the group, it must be clearly stated
- which passages they are (for example, by putting them *in italics* or within 'quotation marks');
- where they come from (for example '… this, in addition to the fact that measurements have indicated that the effect is negligibly small (see chapter V of this report), brings us to the conclusion that…')

For matters taken over from persons outside the group, the same rules apply as for individual written work, of course.

3. 'Joint' group written work

The group as-a-whole is responsible for the complete contents of the report, even if each one has taken responsibility for the writing of a separate part. In that case it is not necessary to indicate precisely which idea is whose. Nevertheless the rules for making used of external sources are still the same as those for individual written work. When the student does not follow the rules stated above, and thus literally includes someone else's work or paraphrases it without a clear indication of the source, he commits plagiarism. Not only copying without indicating the source, but also allowing the copying, is taken to be plagiarism/fraud. In joint group written work it is possible, in principle, in this case to accuse the complete group of fraud.