

Course catalogue

Master's programme

Energy Science

2020-2021

**Faculty of Geosciences
Vening Meinesz building A
Princetonlaan 8a
Postbox 80.115
3508 TC Utrecht
The Netherlands
Telephone + (31)30-253 7600**

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Preface

Welcome to the Master's programme Energy Science.

The Master's programme Energy Science is part of the Graduate School of Geosciences and is organised by the Copernicus Institute of Sustainable Development. The programme aims to teach you the specialised knowledge and professional attitudes and skills you need to become a first class researcher in academic and professional organisations in the field of energy science. The close link to the excellent research of the Copernicus Institute of Sustainable Development, combined with the small scale of the groups, the international setting of the Master's programme and the pleasant working atmosphere will contribute to this aim.

We hope this course catalogue will help you to find the relevant information you need as a student in the Master's programme easily. First you will find a general description of the programme, the structure, the components and some organisational matters. This is followed by information about procedures, and the UU-time table is also included in the catalogue. The Education and Examination Regulations 2020-2021 (OER) can be found in Appendix II and the Regulations of the Board of Examiners in Appendix III.

At any time during your studies you will need two course catalogues: one of the year you started your Master's programme in Energy Science (this shows the exam programme that you need to follow) and one of the most recent academic year, which shows the current rules and regulations.

You can find more information on the website at <http://students.uu.nl/en/geo/energy-science> and in the Blackboard community for all Energy Science students. Still, if you have some (personal) questions, you can contact the student advisor of the programme or contact the programme leader.

On behalf of the staff we wish you an inspiring, pleasant and successful new academic year!

Dr. Floor van der Hilst, Programme Leader Master Energy Science
and
Prof. Dr. Stefan Dekker, Director of Education Copernicus Institute of Sustainable Development

1 Content of the programme

1.1 Introduction

Energy is of paramount importance to society. The development of the global energy system is closely linked to the economic and technological development of society. There are enormous challenges ahead of us, such as mitigating climate change, securing our long term energy supply and providing access to clean and efficient energy for everyone. There is broad consensus that we need to work on a global transition to a sustainable energy system, of which energy efficiency and renewable energy are key components.

The Master's Programme Energy Science will provide you with a deep understanding on how energy systems work, and how they can be analysed and modeled. You will also get detailed insight into current and future energy technologies. However, the scope of the programme is much broader: you will also learn about energy economics and energy and climate policies.

1.2 Mission of the Master's programme

The aim of the Master's programme Energy Science is:

To educate natural scientists and engineers to be able to contribute to the transitions towards sustainable energy systems, by doing applied research, by working in the energy industry, doing consultancy work or being employed in governmental organisations dealing with energy and environmental issues.

1.3 Relation between the Master's programme and the Copernicus Institute

The Master's programme is closely affiliated to the Copernicus Institute of Sustainable Development, which is part of Utrecht University. The research conducted at the Copernicus Institute covers a wide range of issues related to sustainable development and innovation. The starting point of all research is the source-impact chain that links economic activities with ecological values. For more information on the research programme, research themes and groups of the Copernicus Institute, see: <http://www.uu.nl/Copernicus>.

Most of the energy-related research in the Copernicus Institute is carried out in the group Energy and Resources, led by prof. dr. Gert Jan Kramer. The research of this group covers a variety of topics, including energy efficiency in manufacturing industry, bio-energy, biomaterials, carbon dioxide-capture-and-storage, solar photovoltaic energy, power system modelling and smart grids. Most of the teachers in the Energy Science programme are part of this group.

1.4 Competence profile

The MSc programme Energy Science has the following degree qualifications:

The graduate:

1. has advanced knowledge and understanding of the dynamics and challenges of Energy Science in the context of both organisations and society at large; in particular of energy production, consumption and the consequences of energy production and energy use for people, the economy, the environment and future generations;

2. is able to conduct research on the dynamics and challenges of Energy Science in a creative and independent way; in particular research methods for energy system analysis and new multidisciplinary research on energy systems at various scales (micro, regional, national and international) and the graduate can apply these methods in research on energy systems;
3. has the ability to apply knowledge and research methods, and problem-solving abilities in broader contexts related to the dynamics and challenges of Energy Science; in particular the ability to design strategies to make energy systems sustainable in a creative and independent way;
4. has insight into the complex interactions between science, innovative technology and society and is able to reflect critically upon the roles of science and technology in society;
5. has professional and academic skills, in particular in relation to the dynamics and challenges of Energy Science;
6. is able to apply knowledge and understanding in such a way that he or she demonstrates a professional approach to their work;
7. is able to communicate conclusions, as well as the knowledge, reasons and considerations underlying these conclusions, to an audience of specialists and non-specialists alike.

1.5 Curriculum

Energy Science is a 2 year full-time Master's programme (120 EC).

Two tracks exist:

- **Systems Analysis.** In this track the student receives an all-round training in all aspects of energy systems, including technology, economics and policy. In this track students complete a consultancy project (15 EC) and a Master's thesis (30 or 45 EC).
- **Natural Science.** In this track, the students get familiar with energy systems and energy systems analysis, but the focus is more on the natural science aspects. In this track students complete a Natural Science Research Project (30 EC) and a Master's thesis (30 EC).

The Systems Analysis track consists of 52.5 EC mandatory courses, a 30 EC or 45 EC Master's thesis and 22.5 EC or 37.5 EC elective courses. The Natural Science track consists of 37.5 EC mandatory courses, 22.5 EC elective courses and 60 EC of natural science research project and Master's thesis.

1.6 Systems Analysis track

Mandatory courses

- | | |
|---|--------|
| • Energy in the Context of Sustainability (GEO4-2514) | 7.5 EC |
| • Energy Conversion Technologies I (thermal/chemical) (GEO4-2502) | 7.5 EC |
| • Advanced Energy Analysis (GEO4-2508) | 7.5 EC |
| • Energy Conversion Technologies II (physical/mechanical) (GEO4-2503) | 7.5 EC |
| • Energy Systems Modelling (GEO4-2515) | 7.5 EC |

Research projects and practical work

- | | |
|--|----------------|
| • Consultancy project (GEO4-2519) | 15 EC |
| • Master's thesis (GEO4-2510 or GEO4-2523) | 30 EC or 45 EC |

Elective courses

Students should select courses for a total of 22.5 or 37.5 EC (depending on the size of the thesis). Rules for choosing electives are described in Appendix I.

The course calendar 2020-2021 can be found in section 1.9.

Master's thesis and internship in the systems analysis track

In the last stage of the Master's programme Energy Science, Systems Analysis track, a Master's thesis (research project) is conducted. An internship (15 EC or 22.5 EC) can be conducted as an elective course.

The main differences between the Master's thesis and the internship are summarized in the table below.

	Master's thesis	Internship
Main aim	Learn how to do research	Learn to be a professional
Location	Internal at UU, at another university or at a research institute or another environment with sufficient academic level	External , in general not a research institute

1.6.1 Master's thesis Systems Analysis track

This is a research project in which the student will learn to conduct research independently, whereby new methods are developed and/or accepted or existing methods are applied to a new problem. The research should be relevant from both a scientific point of view (it should expand the body of scientific knowledge) and a societal point of view (it should produce knowledge that can contribute to a better understanding or the solution of societal problems in the area of energy). Information on procedures, entrance requirements, place of research, output etc. can be found in the course description in this catalogue and in the course manual Master's thesis Energy Science.

1.6.2 Internship Systems Analysis track

The internship (GEO4-2520 or GEO4-2524) is an opportunity to become acquainted with the practices one will later encounter in the work place. It is an applied research or consultancy project that contributes to solving a problem in the field of energy and materials and at the same time is relevant to policy and/or management.

The internship should meet the following criteria:

- The internship has a weight of 15 EC or 22.5 EC, which is equivalent to 11 or 16 fulltime working weeks (40 hours per week).
- During the internship you should work on a single assignment (rather than multiple small tasks) at the host institution. Your work will result in a report.
- The internship research proposal is to be submitted within 4 weeks after you and your supervisor have agreed on starting an internship procedure.
- An internship contract between the host institution and the university is **mandatory**. Always send your contract to Erika Dijkma (e.b.dijkma@uu.nl) to be checked **before** you sign the contract. It is preferable that you use the UU internship contract, available via Blackboard.
- A staff member of the Department (the responsible lecturer or "academic supervisor") and a person at the host institution (the "daily supervisor") are responsible together for guiding and supervising the student.
- Your report will be assessed, in first instance, by the host supervisor. The final assessment will be made by the academic supervisor, who will be the person who is responsible for grading.

Information on procedures, entrance requirements, place of research, output etc. can be found in the course description on Osiris and in the course manual Master's thesis Energy Science, and specific internship guidelines which can be found on the Blackboard Community Energy Science. The Faculty of Geosciences has its own digital internships database: <http://internships.geo.uu.nl>.

1.6.3 Combining the Master's thesis with an internship

The internship can be connected with the Master's thesis. It may have added value to do more in-depth research on a topic that you encountered during the internship. Or an internship may be an opportunity to explore the practical side of a topic that you work on in a research project.

In either case, the thesis and the internship are seen as two courses and each has its own course objectives and deliverables. At the very least, this means two reports need to be written and two presentations made. The exact deliverables can be found in the course descriptions.

For further questions you can contact the coordinator of the Master's thesis: dr. F. van der Hilst, F.vanderHilst@uu.nl (tel. 030-2537609).

1.7 Natural Science Track

Mandatory courses

- Energy in the Context of Sustainability (GEO4-2514) 7.5 EC
- Energy Conversion Technologies I (thermal/chemical) (GEO4-2502) 7.5 EC
- Advanced Energy Analysis (GEO4-2508) 7.5 EC
- Energy Conversion Technologies II (physical/mechanical) (GEO4-2503) 7.5 EC
- Energy Systems Modelling (GEO4-2515) 7.5 EC

Mandatory natural science electives

Two natural science courses (15 EC) need to be completed, e.g.:

SK-MAKC, Adsorption, Kinetics and Catalysis

SK-MSYNA Synthesis of heterogeneous Catalysts

SK-MSOLS Solids and Surfaces

SK-MNCCN: Nanomaterials: Catalysis, Colloids, Nanophotonics

NS-NM429M: Soft Condensed Matter

NS-TP432M: Modelvorming en simulatie

GEO4-2513: Photovoltaic Solar Energy Physics and Technology

GEO4-1426: Kinetic Processes

GEO4-1410: Mechanisms of deformation and transport in rocks

GEO4-1434: Principles of groundwater flow

GEO4-1425: Earth resources, mineral and petroleum resources: integrated exploration modelling

GEO4-6001: Quantitative Water Management

Free elective courses

Students should select courses for a total of 7.5 EC. Rules for choosing electives are described in Appendix I.

Master's thesis and practical work

Natural Science Research Project (GEO4-2518) 30 EC

Master's thesis (GEO4-2510) 30 EC

The course calendar 2020-2021 can be found in section 1.9.

1.7.1 Natural Science Research Project and Master's thesis in the Natural Science track

Within the track Natural Science two different research activities are obligatory. Firstly, a Natural Science Research Project is to be performed in the field of natural science and amounts to 30 EC. It is a research project in which the student will learn to conduct research independently in a natural science field which is energy-related.

The research should be relevant from both a scientific point of view (it should expand the body of scientific knowledge) and a societal point of view (it should produce knowledge that can contribute to addressing energy-related problems in society). Many groups in the Science Faculty and the Faculty of Geosciences perform basic and/or applied research related to energy, and the variant Natural Science offers students an opportunity to take advantage of this. The research could also be performed at another (inter)national Science Faculty.

Secondly, a topic in the field of Energy Science must be selected to complete the Master's Programme with a Master's thesis, amounting to 30 EC. A 45 EC thesis is not allowed in the Natural Science track.

The Thesis and the Natural Science Research Project are seen as two courses and each has its own course objectives and deliverables. At the very least, this means two reports need to be written and two presentations made. The exact deliverables for each course can be found in the course descriptions and in the course manual Master's thesis Energy Science.

Information on procedures, entrance requirements, place of research, output etc. can be found in the course description on Osiris and in the course manual Master's thesis Energy Science, which can be found on the Blackboard Community Energy Science.

1.8 Elective courses

Electives are subject to some restrictions e.g. the elective course should be at Master level and should be related to the subject of energy or relevant for the Research Project/Master's thesis. Some elective courses must be approved in advance by the Board of Examiners. The full rules and procedure for choosing electives are described in Appendix I of this course catalogue.

In the programme room has been scheduled for taking electives. However, the student is free to deviate from this planning, e.g. because (s)he wishes to take an interesting elective course taught in another period. If this causes delay in study planning, the responsibility is for account of the student! Students are therefore strongly advised to take their electives in the reserved periods and timeslots, or use a part of these timeslots for the first part of the research project/master's thesis.

Elective courses Systems Analysis track

Students should select courses for a total of 22.5 EC or 37.5 EC, depending on the size of the thesis.

Possible electives include an internship for 15 EC or 22.5 EC (GEO4-2524 or GEO4-2520), the course Writing a scientific article (GEO4-2516, by invitation only), the Tailor-made course (GEO4-2517), Bio-based Economy (GEO4-2521), Energy in the Built Environment (GEO4-2522) or other additional elective course(s).

Elective courses Natural Science track

Students should select one free elective course of 7.5 EC.

Furthermore, students in the Natural Science track should choose at least two natural science courses (15 EC), which may be selected from the list mentioned in section 1.7.

1.9 Course schedules 2020-2021

1.9.1 Course schedule ES (Systems Analysis) 2020-2021

Bold and underlined = obligatory course

Normal = elective

Year 1 (intake 2020)

Period 1	<u>(A) Energy in the Context of Sustainability, GEO4-2514</u>	<u>(C) Energy Conversion Technologies I, GEO4-2502</u>
Period 2	<u>(D) Advanced Energy Analysis GEO4-2508</u>	<u>(A) Energy Conversion Technologies II, GEO4-2503</u>
Period 3	<u>(D) Energy Systems Modelling, GEO4-2515</u>	Elective (7.5 EC)
Period 4	<u>(A+B+C+D) Consultancy Project ES, GEO4-2519 (15 EC)</u>	

Year 2 (intake 2019)

Period 1	<u>Master's thesis, GEO4-2510/2523 (30/45 EC)</u>
Period 2	
Period 3	
Period 4	
Internship Energy Science, GEO4-2520/2524 (22.5 EC or 15 EC) Or Additional electives	

Students should select electives for a total of 22.5 EC or 37.5 EC (this depends on the size of the thesis). This can be a combination of the following:

- Internship (GEO4-2520/GEO4-2524) 22.5 EC or 15 EC
- electives

Possibly interesting electives offered by the Copernicus Institute:

- GEO4-2323: Environmental Ethics (1A)
- GEO4-2522 Energy in the Built Environment (1B)
- GEO4-2338: Squaring the Circular Economy (2B)
- GEO4-2005: Sustainable Food Systems (2D)
- GEO4-2327: Climate System and Adaptation (2B)
- GEO4-2521: Bio-based Economy (3A)
- GEO4-2303: Environmental Systems Analysis (3A + B)
- GEO4-2513: Photovoltaic Solar Energy Physics (4A)

See also website: <http://students.uu.nl/en/geo/energy-science/academics/study-programme/electives>

Recommended electives do not need to be approved by the programme leader or the Board of Examiners.

1.9.2 Course schedule ES (Natural Science) 2020-2021

Bold and underlined = obligatory course

Italics and underlined = obligatory choice: 2 natural science courses (see 1.7)

Normal = elective

Year 1 (intake 2020)

Period 1	<u>(A) Energy in the Context of Sustainability, GEO4-2514</u>	<u>(C) Energy Conversion Technologies I, GEO4-2502</u>
Period 2	<u>(D) Advanced Energy Analysis GEO4-2508</u>	<u>(A) Energy Conversion Technologies II, GEO4-2503</u>
Period 3	<u>(D) Energy Systems Modelling, GEO4-2515</u>	elective (7.5 EC) or <i><u>Natural science course</u></i>
Period 4	<u>Natural Science Research Project, GEO4-2518 (30 EC)</u> Or: <i><u>Natural science course</u></i>	

Year 2 (intake 2019)

Period 1	<u>Master's thesis, GEO4-2510 (30 EC)</u> <u>Natural Science Research Project, GEO4-2518 (30 EC)</u>
Period 2	
Period 3	
Period 4	

Possibly interesting electives offered by the Copernicus Institute:

GEO4-2323: Environmental Ethics (1A)

GEO4-2522 Energy in the Built Environment (1B)

GEO4-2338: Circular Economy (2B)

GEO4-2005: Sustainable Food Systems (2D)

GEO4-2327: Climate System and Adaptation (2B)

GEO4-2521: Bio-based Economy (3A)

GEO4-2303: Environmental Systems Analysis (3A + B)

GEO4-2513: Photovoltaic Solar Energy Physics (4A)

See website: <http://students.uu.nl/en/geo/energy-science/academics/study-programme/electives>

Recommended electives do not need to be approved by the programme leader or the Board of Examiners.

1.10 Entrance requirements and other restrictions ES-courses

Some courses carry entrance requirements and/or recommended prerequisites or may have other entrance restrictions. The tables below show which courses in the Energy Science programme carry which requirements.

In case of a discrepancy between the entrance requirements and/or recommended pre-requisites and/or other restrictions mentioned in this course catalogue and the ones mentioned in the electronic UU course offerings database 'Osiris', the entrance requirements and/or recommended pre-requisites and/or other restrictions mentioned in the tables below are leading.

Entrance requirements Energy Science courses:

Course	Entrance req./recommended prerequisites
Energy conversion technologies I (GEO4-2502)	Recommended prerequisites: <ul style="list-style-type: none"> - Knowledge of Elementary thermodynamics, heat transfer and calculus
Energy conversion technologies II (GEO4-2503)	Recommended prerequisites: <ul style="list-style-type: none"> - Knowledge of Elementary thermodynamics and calculus
Advanced Energy analysis (GEO4-2508)	Recommended prerequisites: <ul style="list-style-type: none"> - Knowledge of Energy Analysis and calculus
Master's thesis 30 EC (GEO4-2510)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science - At least 45 EC passed within the programme Energy Science including: <ul style="list-style-type: none"> • Advanced Energy Analysis (GEO4-2508) • Energy Conversion Technologies I (GEO4-2502) • Energy Conversion Technologies II (GEO4-2503) • Energy Systems Modelling (GEO4-2515) Recommended prerequisites: <ul style="list-style-type: none"> - Consultancy Project (GEO4-2519)
Photovoltaic Solar Energy Physics and Technology (GEO4-2513)	Recommended prerequisites: <ul style="list-style-type: none"> - Basic knowledge of solid state physics or condensed matter physics - Calculus skills
Energy in the Context of Sustainability (GEO4-2514)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science or MSc Innovation Sciences
Energy Systems Modelling (GEO4-2515)	Recommended prerequisites: <ul style="list-style-type: none"> - Energy Analysis (GEO3-2223) - Advanced Energy Analysis (GEO4-2508)
Writing a scientific article (GEO4-2516)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science - Minimum mark of 8.0 for Master's thesis or Natural Science Research Project AND - Invitation from Master's thesis's or Natural Science Research Project's supervisor.
Tailor made course ES (GEO4-2517)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science - At least 45 EC passed within the programme
Natural Science Research Project (GEO4-2518)	<ul style="list-style-type: none"> - Obligatory for and only open to cohorts 2013 and later, Natural Science track - Letter of acceptance MSc Energy Science Passed examinations of: <ul style="list-style-type: none"> - Advanced Energy Analysis (GEO4-2508) - Energy Conversion Technologies I (GEO4-2502) - Energy Conversion Technologies II (GEO4-2503) - Energy Systems Modelling (GEO4-2515) Recommended prerequisites:

	<ul style="list-style-type: none"> - At least one natural science elective.
Consultancy project (GEO4-2519)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science - Only open to students in track Systems Analysis <p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Advanced Energy Analysis (GEO4-2508) - Energy Systems Modelling (GEO4-2515)
Internship Energy Science 22.5 EC (GEO4-2520)	<ul style="list-style-type: none"> - Only open to cohorts 2013 and later - Only open to students in track Systems Analysis - Letter of acceptance MSc Energy Science <p>Passed examinations of:</p> <ul style="list-style-type: none"> - Advanced Energy Analysis (GEO4-2508) - Energy Conversion Technologies I (GEO4-2502) - Energy Conversion Technologies II (GEO4-2503) - Energy Systems Modelling (GEO4-2515) <p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Consultancy Project (GEO4-2519)
Bio-based Economy (GEO4-2521)	<p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Advanced Energy Analysis (GEO4-2508) - Life Cycle Analysis (GEO3-2124; BSc course) - Toolbox 1 (GEO4-2602) - Science and technology for Sustainable development (SK-BCHDO; BSc course)
Energy in the Built Environment (GEO4-2522)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science or MSc Innovation Sciences or MSc Sustainable Development or MSc Sustainable Business & Innovation <p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Basic principles of energy flows in the built environment, i.e. electricity, heat and gas networks. - Basic knowledge on power system planning & operation and electricity markets. - Basic principles of Python programming and linear optimisation. An online course will be recommended to the students, which has to be completed at the beginning of the EBE course.
Master's thesis 45 EC (GEO4-2523)	<ul style="list-style-type: none"> - Letter of acceptance MSc Energy Science - At least 45 EC passed within the programme Energy Science including: <ul style="list-style-type: none"> • Advanced Energy Analysis (GEO4-2508) • Energy Conversion Technologies I (GEO4-2502) • Energy Conversion Technologies II (GEO4-2503) • Energy Systems Modelling (GEO4-2515) <p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Consultancy Project (GEO4-2519)
Internship Energy Science 15 EC (GEO4-2524)	<ul style="list-style-type: none"> - Only open to cohorts 2013 and later - Only open to students in track Systems Analysis - Letter of acceptance MSc Energy Science <p>Passed examinations of:</p> <ul style="list-style-type: none"> - Advanced Energy Analysis (GEO4-2508) - Energy Conversion Technologies I (GEO4-2502) - Energy Conversion Technologies II (GEO4-2503) - Energy Systems Modelling (GEO4-2515) <p>Recommended prerequisites:</p> <ul style="list-style-type: none"> - Consultancy Project (GEO4-2519)

Other restrictions Energy Science courses:

Course	Max. participants	Other restrictions
GEO4-2502: ECT I	-	Open access
GEO4-2503: ECT II	-	Open access
GEO4-2508: AEA	-	Open access
GEO4-2510: Master's thesis (30 EC)	-	Only open for Energy Science.
GEO4-2513: Photovoltaic Solar Energy Physics and Technology	-	Open access
GEO4-2514: Energy in the Context of Sustainability	-	Only open for Energy Science and IS
GEO4-2515: Energy Systems Modelling	-	Open access
GEO4-2516: Writing a Scientific Article	-	Only open for Energy Science
GEO4-2517: Tailor made course ES	-	Only open for Energy Science
GEO4-2518: NS Research Project	-	Only open for Energy Science NS, cohort 2013 and later
GEO4-2519: CP-ES	-	Only open for Energy Science SA
GEO4-2520: Internship Energy Science (22.5 EC)	-	Only open for Energy Science SA, cohort 2013 and later
GEO4-2521: Bio-based Economy	-	Only open for Energy Science, Innovation Sciences, Sustainable Development, Sustainable Business & Innovation and Chemistry
GEO4-2522: Energy in the Built Environment	-	Only open for ES, IS, SBI and SUSD
GEO4-2523: Master's thesis (45 EC)	-	Only open for Energy Science
GEO4-2524: Internship Energy Science (15 EC)	-	Only open for Energy Science SA, cohort 2013 and later

Exclusions:

Students that passed the course:	... are not allowed to take the course:
GEO4-2325	GEO4-1441/1517A/ 1425/1437

1.11 Conversion of former courses

Not applicable in 2020-2021.

1.12 Extra-curricular programmes

1.12.1 Profile Complex Systems

The world around us is becoming more and more complex. A small change in one variable can have a significant impact, resulting in e.g. traffic jams, a sudden epidemic or a financial crisis. Complex Systems are often the driving force behind these phenomena. As a whole they possess characteristics which cannot be deducted simply from its individual parts, but only from the way in which these are combined together. Predicting a traffic jam is e.g. hardly possible by only studying the behavior of individual drivers. The whole is bigger than the sum of its parts.

The profile Complex Systems is an interdisciplinary profile for ambitious students from different Master's programmes, who want to work on modelling solutions within the field of Complex Systems. The profile gives you the opportunity to broaden your view and knowledge from an interdisciplinary angle and widens your opportunities for further development. It prepares you for a career in interdisciplinary fields at, for instance, financial companies.

This profile can be fitted into your Master's programme, 30 EC in total. You will receive a Complex Systems certificate.

In order to qualify for the annotation, the following requirements must be fulfilled:

Courses (15 EC)

Having passed the examinations of two (elective) courses:

- Energy Systems Modelling (GEO4-2515; 7,5 EC)
- a choice of one from the following courses:
 - Introduction to Complex Systems, (WISM484; 7,5 EC)
 - Algorithms in Finance (WISM410; 7,5 EC)
 - Seminar Modelling Health Effects of Ionizing Radiation (WISM409; 7,5 EC)
 - Understanding Complexity: Economy and the Planet (NS-MO450M; 7,5 EC)

Research Project (15 EC)

A research project/literature study on a topic in the field of complex systems. Focus should be on interdisciplinary aspects and at least two supervisors from different departments/faculties should be involved. The topic may NOT correspond with the topic of your Master's thesis. The topic should be approved by the steering group members of the Foundations of Complex systems focus area who are involved and by the programme director of your Master's programme.

The total number of EC will NOT be increased by completing the Master profile Complex Systems.

If you have questions about the profile, please ask your Master's programme leader for more information. You can apply for this Master profile by sending an email to the coordinator Complex Systems, dr. Mara Baudena: M.Baudena@uu.nl. More information about the research on Complex Systems.

1.12.2 Annotation Sustainable Entrepreneurship & Innovation

The Master Annotation Sustainable Entrepreneurship & Innovation is a university wide Master track that aims to deliver world leading change agents in the area of sustainability. Students enrolled in the Master's programme Energy Science can qualify themselves for the Annotation Sustainable Entrepreneurship & Innovation next to their Master's degree ES and will obtain an additional certificate. In order to qualify for the annotation, the following three requirements must be fulfilled:

- 1) having passed the examinations of one of these two courses:
 - Innovation Management (GEO4-2268; 7,5 EC) with an assignment regarding a sustainability subject;
 or:
 - Sustainable Entrepreneurship (ECMSE; 7,5 EC).

- 2) having passed the examinations of one of these (elective) courses, which may not be the same course as the course passed for fulfillment of requirement 1 mentioned above:
 - GEO4-2521: Bio-based economy
 - GEO4-2514: Energy in the Context of Sustainability
 - GEO4-2604: Governance and Change Management for Sustainability (SBI students have priority)
 - GEO4-2268: Innovation Management
 - GEO4-5501: Techniques of Futuring
 - ECMSE: Sustainable Entrepreneurship

- 3) having conducted a research project of at least 15 EC related to the subject of Sustainable Entrepreneurship & Innovation. This must be achieved with the Master's Thesis (GEO4-2510; 30 EC or GEO4-2523; 45 EC) or with the Consultancy Project (GEO4-2519; 15 EC) on a subject related to Sustainable Entrepreneurship & Innovation.

The requirements for the research component are:

- It is about newly developed or to be developed sustainable production processes, products, and/or services created by firms (within established firms and/or new start-ups);
- These activities need to be new to the current business activities of these firms;
- It needs to include some form of data collection about these new business activities.

In the research proposal for the Master's thesis or Consultancy project students have to stipulate the fit of their research proposal to these three requirements for the research component in a separate section.

If you decide to undertake the Annotation, please indicate this on the form for choosing elective courses: http://students.uu.nl/sites/default/files/geo-iees-application_form_optional_courses.pdf

In order to qualify for the third requirement, you should indicate the choice for the annotation on the Master's thesis research proposal information form or the Consultancy Project Information form. You can find these forms in the Blackboard community of Energy Science. Once you have completed the Master's thesis/Consultancy Project, it will be checked whether it meets the requirements. If you have met all requirements for the annotation, you will be awarded an Annotation certificate together with your Master's degree certificate.

1.12.3 Climate-KIC EIT Master Label

For MSc students who are extra motivated and enjoy thinking outside of the box, we offer access to the Climate-KIC Master Label. Students explore climate science and sustainable entrepreneurship alongside their regular master courses, and develop valuable tools for becoming tomorrow's change makers in the field of climate adaptation and innovation.

For ES Master's students, this programme consists of:

- Two of the following courses, of which at least one course with an * has to be taken:
 - GEO4-2521: Bio-based economy
 - GEO4-2514: Energy in the Context of Sustainability
 - GEO4-2604: Governance and Change Management for Sustainability (SBI students have priority)
 - GEO4-2268: Innovation Management*
 - GEO4-5501: Techniques of Futuring
 - ECMSE: Sustainable Entrepreneurship*
 - GEO4-2327: Sustainable Food Systems
 - GEO4-2328: Circular Economy
- The climate innovation summer school - The Journey
- A series of thought-provoking SPARK! talks and seminars
- International mobility: Students must complete a period of geographical international mobility (min. 15 EC) at another university (academic semester/year, for instance) or by doing an internship abroad (applied research internship, industrial internship, for instance)
- Real-life work experience mobility. Students must complete a period of real-life work experience (min. 15 EC) outside their home university (applied research internship, industrial internship, development of their own start-up, for instance)
- Master's thesis on a topic related to climate innovation and/or sustainable entrepreneurship.

Both types of mobility can be merged into one if the students complete a period of real-life work experience outside their home university in another country (30 EC).

Students who complete the Climate-KIC EIT Master Label will receive the EIT Master Label certificate. *It is not possible to receive both the EIT certificate and the annotation certificate.* More information on the programme and the enrolment procedure is available at: <https://learning.climate-kic.org/en/master-label-programme>.

Note: as of September 2020 it is no longer possible to receive elective credits for the Summer school - The Journey and/or the SPARK lectures.

1.12.4 Young Innovators Programme

Utrecht University offers the Young Innovators Programme to high-achievers with leadership potential. Young Innovators Programme is a selective 15 EC honours course at graduate level, to be taken *on top of* any Master's programme.

The Young Innovators programme embodies a community of learning, where the focus is on creating positive impact through social innovation and personal leadership. As such, the programme focuses on learning to research, design and deliver innovative and sustainable solutions to real-life societal challenges. Supported by leading researchers from the University's strategic theme Institutions for Open Societies, the programme allows you to immerse yourself in both theory and practice of innovation across corporate, public and community sectors.

During this program you will be stimulated to collaborate, produce and learn in multidisciplinary teams. In this, you are challenged to take ownership of both your own and collective learning processes and thereby invited to co-create the program design.

Young Innovators is an honours programme designed for students who have the will and ability to stretch themselves beyond the confines of their regular Master's programme. Young Innovators is about learning and working differently: experientially, through ownership, through challenging teamwork, on the borderlines of academia and practice, and at the interface of research and intervention.

Being part of this learning community, you:

- are part of an inspiring and experiential learning environment that may further enhance the basis for your professional network;
- work in an interdisciplinary team on a real-life societal challenge;
- present your team's work-in-progress at several plenary conferences;
- attend supportive meetings to acquire the knowledge, skills and inspiration needed for social innovation;
- learn to take ownership of your own learning processes and the program design.

Interested in this programme? Learn more about the admission requirements?

<http://www.uu.nl/masters/en/general-information/international-students/about-utrecht-university/young-innovators>.

1.12.5 SENSE Honours Programme

The SENSE Research School offers a maximum of 15 excellent MSc students of SENSE related MSc programmes the opportunity to participate in the 'SENSE Honours Programme'. This programme prepares highly motivated MSc students for an academic research career by writing a full PhD research proposal on a self-selected subject within the field of 'Environmental and Sustainability Sciences'. At the conclusion of the SENSE Honours Programme the participating MSc students will be in an excellent position to pursue a career as PhD candidate in one of the participating SENSE research groups (or anywhere else in the world). The SENSE research groups will support the MSc students to find funding for their PhD proposal or to find a position as PhD candidate. In previous years, more than 75% of the SENSE MSc Honours students obtained a PhD position. Succeeding this programme will give you an excellent preparation for a career in science!

Excellent MSc students are nominated by professors, thesis supervisors, lecturers or by the coordinator of the participating MSc programmes. MSc students who are interested in the programme, please contact your thesis supervisor, lecturer or MSc programme coordinator. More information can be found here: <http://www.sense.nl/honours>. Or contact Monique Gulickx: monique.gulickx@wur.nl.

2. Didactics, study management and practical matters

2.1 Educational format

Activating education

The educational philosophy of the Master's programme is problem-orientated, which calls for a proactive teaching format. Problem-orientated education takes a concrete problem as the point of departure for the learning process. The acquisition of knowledge and skills is related to the analysis and/or solution of the problem in question. "Activating education" is a form of teaching whereby the students themselves are largely in control of the learning process. They take their education into their own hands by doing individual or group assignments, taking part in debates or simulation games, and applying the methods they have learned. A proactive educational format calls for intensive back-up on the part of the instructor in the form of study guidelines, instructions, manuals, and feedback on the students' performance. The students mainly work in small groups.

Active input of instructors and students

The objective of the Master's programme is to offer an inspiring and high-quality environment for study. The goal is to work together with the student to maximise the transfer of knowledge. All of the instructors and support staff involved in the programme operate on the assumption that if the student is fully dedicated to the study, they can offer the greatest possible guarantee that the student will pass all of the individual courses.

Required attendance

For various parts of the study, attendance is mandatory. This applies to working groups, field trips, simulation games, etc. The course manual for each course stipulates exactly which sessions the student is required to attend. As stated in article 4.4 of the Education and Examination regulations, exceptions to mandatory attendance can only be made if the student can prove that his absence is due to reasons beyond his control (special circumstances due to e.g. illness or family circumstances).

Report absence in time

If the student cannot attend a preliminary or other exam, obligatory lecture or working group, he/she must register their absence via: <https://fd21.formdesk.com/geo/AbsenceForm> prior to the meeting, and by 9.30 a.m. at the latest.

Absence or illness does not relieve you of your obligation to perform to the best of your ability. In other words, if you have not been able to complete a paper or give a presentation, contact the Course Coordinator to find out if it can be rescheduled for another date.

If the quality or quantity of your attendance has been insufficient, the Course Coordinator may exclude you from the remainder or part of the course.

Testing

There are multiple points during a course in which the student is tested. Thus, the final evaluation for a course does not depend solely on a final exam. As a rule, there are opportunities for feedback and improvement, depending on how the course is designed. These opportunities are set forth in the course manual. If during the course the student satisfies all the effort requirements and does not receive a satisfactory grade but does receive a final grade of at least 4.00 before rounding, he or she will be given one opportunity to take a supplementary test. To prevent freeriding behaviour in group assignments, it may be demanded that a sufficient grade (at least 5.50) is scored for certain individual, partial tests. The specifics can be found in the Education and Examination Regulations and the course manuals.

Plagiarism, Code of Originality

Energy Science is a research oriented Master's programme, which means that its students are taught how to perform scientific research and which demands their approach and results need to meet. Since science is about developing new knowledge, in all phases of the Master's programme, much attention is paid to the originality of the students' achievements, for instance with the aid of advanced software. All scientific research, including that of a student, builds on the results of the work of other researchers, either in positive or in negative sense. Those other researchers deserve the credits for their work, in the form of a correct acknowledgement.

In short: quoting is allowed (and even necessary), but copying other researchers' work and presenting it as if it were one's own, is plagiarism: a huge sin in science, and therefore students have to sign a Statement of Originality when they submit the Master's thesis. Students, who plagiarise, run tremendous risks: in the worst case scenario they are expelled from the programme for a year. The Education and Examination Regulations of the programme lists the sanctions with which a student who is caught plagiarising will be confronted.

2.2 Study management and supervision

2.2.1 Introduction for new students

There will be an introduction for Master novices in the first week of their first semester, organised by ES and its study association NRG. Both social issues and general information will be presented during this introduction. Its objective is to help new students feel at home at the Master's programme ES and the faculty, as soon as possible. Focus will be on meeting your fellow students, getting to know the ES-programme itself, its professors, mutual rights and obligations, information desks and the buildings where you will spend much of your time in the next couple of years.

2.2.2 Study planning and advice

Two individuals play a key role in planning and supervising a student's study: the programme leader (dr. Floor van der Hilst) and the Study Advisor, Jana Scheuer MSc.

The programme leader advises students on the programme they will be taking and on the choices that can be made within it. These choices pertain to elective courses and options for internships and thesis research, for instance.

During your entire programme, you can go to the Study Advisor, Jana Scheuer MSc, for neutral and confidential advice on everything that is related to your studies. This can be on issues that are directly study-related, for example study planning, study delay, electives, dissatisfaction with the programme, or a potential conflict with a teacher or supervisor. But you can also discuss more personal issues that might be of influence on your progress, such as illness, disability, pregnancy, family circumstances, top-class sports, motivation issues, et cetera. When necessary, the Study Advisor can refer you to a Student Counsellor, Student Psychologist, or for example a study skills class.

In the unfortunate situation that you expect to suffer study delay due to personal circumstances, it is important to contact the Study Advisor as early as possible. Together you can discuss how you could deal with these circumstances and perhaps the programme could offer you a concession (e.g. extra time for an exam or paper).

The Study Advisor is located in the Koningsberger building, room 1.20 D and available on Wednesday till Friday. There is a walk-in hour every Wednesday between 1-2 pm

where students can ask short questions. Students can also make an appointment by phone via the secretary's office: 030 253 1625 or 030 253 2359 or via Studyadvisor.copernicus@uu.nl.

The Study Advisor is a member of the Dutch National Society of Study Advisors and works according to the code of conduct of this professional society, see www.lvsa.nl for details.

The Study Advisor is in regular contact with other Study Advisors of the Faculty and University, which makes peer feedback and cooperation possible. If the Study Advisor is not available due to illness or holiday and you urgently need a confidential consult, please feel free to contact any of the other Study Advisors of the Faculty of Geosciences. You can find their contact details here: <https://students.uu.nl/en/academics/study-abroad/faculty-information/geosciences>.

2.3 Course enrolment and automatic graduation

2.3.1 Semesters and blocks

Classes take place during two semesters, each of which can be divided into two blocks, or periods of 10 or 11 weeks. In Appendix IV and V you will find the start and end dates of each block for this academic year.

2.3.2 Timeslots

At Utrecht University a so-called timeslot model is used to schedule courses to fit into fixed parts of the week. Using this model prevents overlap in a schedule. In this way it is easy to see if two courses can be taken in the same period.

The Utrecht University timeslot model consists of five slots (A, B, C, D, E).

Timeslot A = Monday morning and Wednesday morning

Timeslot B = Tuesday morning and Thursday afternoon

Timeslot C = Monday afternoon and Thursday morning

Timeslot D = Wednesday afternoon and Friday

Timeslot E = Monday evening until Friday evening

Morning = 09.00-12.45 hours, afternoon = 13.15-19.00 hours, evening = 18.00-21.45 hours.

Periods and timeslots have been put into the course schedule (§1.9). Changes to the course schedule are still possible. The final scheduling (time and lecture room) of each course can be found four weeks in advance in [MyTimetable](#) (pc) or the [MyUU app](#) (smartphone/tablet). Also check the Blackboard e-learning environment of your course for the latest changes in the course programme.

2.3.3 Course enrolment

In order to participate in a course, you need to be enrolled for it: if you are not, you will not have access to the course and its supporting facilities such as Blackboard; neither will results be registered. No enrolment = no participation = no result.

As a student, **course enrolment is your own responsibility!** You decide which courses (elective and mandatory) you want to take in each block. Keep in mind possible entrance requirements to a course; students that do not adhere to entrance requirements cannot enrol for the course and/or will be removed from the course.

Course enrolment is **only possible via internet**, www.uu.nl/Osirisstudent and **only within the official enrolment periods**, which usually fall in the beginning of the previous block (for the dates of the Faculty of Geosciences, please see Appendix V). You can enrol for no more than 2 courses (15 EC) of the Faculty of Geosciences per period (code GEO4-*). Students that enrol on time are generally secured of a place in the course; however, courses that have a limited capacity have certain placement rules. Just before the start of the block, there are 2 days for late enrolment, in case you want to switch courses. Please note: this is only possible for courses that are not full yet; participation is therefore not guaranteed.

If you want to enrol for a course outside the Faculty of Geosciences, there could be different enrolment dates; at some Faculties, students enrol only once per semester.

Each period (or block) you can enrol for a maximum of two courses (15 EC) of the Faculty of Geosciences via Osiris (code GEO4-*). Any student that wants to take a third course, needs permission of the programme. If the 3rd course is a course of one of the Master's programmes of the Copernicus Institute (Innovation Sciences, Sustainable Development, Energy Science, Sustainable Business & Innovation or Water Science and Management; codes GEO4-22**, GEO4-23**, GEO4-25**, GEO4-26** and GEO4-60**), you can fill out a digital form on:

<https://fd8.formdesk.com/universiteitutrecht/additionalcourseGEO>.

Please note:

- This enrolment form needs to be submitted during the regular enrolment period. During the late enrolment (na-inschrijving) it is no longer possible to apply for an additional course.
- You have to be enrolled for your other courses in Osiris before submitting your request for an additional course.
- The additional course should be a course from your own major programme/department.
- Students are not allowed to participate in more than one course in the same timeslot.
- Enrolment in an additional course may be declined by the Director of Education in case of insufficient study progress and/or insufficient capacity for a course.

After the regular enrolment period and during late enrolment periods, no requests for taking a 3rd course will be dealt with and therefore they will always be denied. If the course is full, the request for a 3rd course will also be denied. Only as an exception and based on sufficiently important reasons will the programme allow a student to take three courses in one period.

A request for taking a 3rd course will need to address the criteria mentioned below and these will be checked:

- Motivation: what is the student's motivation?
- Circumstances: are there any special, personal circumstances?
- Urgency: is it, at this point in time, necessary that the student takes three courses at once?
- Feasibility: can the student handle taking three courses at the same time? The following issues will be looked at in order to check this criteria:
 - o Study progress.
 - o Study results so far.
 - o Has the student taken three courses before and if so, were they all completed successfully?
- Is the Master's thesis one of the three courses the student wishes to take? If this is the case, the request will not be granted.

- Timeslot: if the 3rd course falls in the same timeslot as any of the other courses you will be taking, the request for a 3rd course will never be granted.

Students that do not adhere to the enrolment periods can only under very special circumstances be placed in a course after permission from the Board of Examiners, which can be reached via examencommissie.geo@uu.nl. Always give your student number when communicating with the Board of Examiners. The Board of Examiners (NOT the lecturer of the course) decides whether you have a valid reason for not enrolling during the enrolment periods. If the Board of Examiners decides you do not have a valid enough reason, you cannot attend a course and no course results will be registered.

In other words: enrol early, as early as possible, for the courses that you want to take in the next block! This also applies to obligatory courses!

2.3.4 Automatic graduation

When you are due to finish your programme, you will receive a message from the student administration about your graduation. After it has been verified that you have fulfilled all requirements of your programme, the Board of Examiners will be asked to judge your file. Please note: in order to graduate, you need to have fulfilled all requirements: all grades are known and registered in Osiris, you have paid all tuition fees, hard copies of any earlier decisions taken by the Board of Examiners have been handed in to the Student Affairs office Geosciences (if applicable) and you have uploaded your thesis to Scripties Online, see (<https://osiris.library.uu.nl/scrol2/index.html?ou=GEO>). Under certain conditions, it is possible to postpone your graduation, see article 6.1.6 of the Education and Examination Regulations.

In order to actually receive your degree certificate or to pick it up at Student Affairs, you need to fill out an exam-registration form. If you want to attend a graduation ceremony, strict deadlines regarding registration and handing in of any documents will be maintained.

Automatic graduation does not mean you will be de-registered automatically from the programme. You will need to take care of this yourself and this cannot be done until you have received formal confirmation of your graduation from the Board of Examiners.

2.4 MyTimetable and MyUU App

Utrecht University has two main channels that allow you to look into the schedule of your course. The schedules are published on those channels four weeks before the start of the course. Along with viewing the complete schedule of your courses it is also possible to check the schedule of your own group, as soon as the lecturer informed you on the division of the groups. You can log in with your Solis-ID and password.

You can make use of **MyTimetable** (<https://mytimetable.uu.nl>) on your browser. Along with a more clear representation of the schedule, it is also possible to synchronise your own schedule with your diary.

On your smartphone you can use the **MyUU-app**. Download this application and always have your schedules and grades from Osiris at hand. The MyUU-app is available for Android and iOS.

2.5 Study abroad

Studying abroad means broadening your horizon, meeting new people, exploring different cultures, and expanding your field of study. If you are interested in going abroad there are many possibilities. You can follow courses, do an internship or conduct research. Make use of what the university in general, but the Faculty of Geosciences in particular, has to offer you.

A lot to organise?!

Don't worry, just make sure to start planning your period abroad in time. Do you want to study abroad? Start via the International Office Online:

<http://students.uu.nl/en/academics/study-abroad>.

Answer these questions:

- Where would you like to go to?
- What do you want to do?
- Does this university have an agreement with UU?
- Which courses would you like to attend?
- When would you like to go?

Once you have found an answer to these questions, contact your Study Advisor to connect your period abroad to your study plan in Utrecht. Please ask also permission from your Master's programme leader.

After you have consulted with your Study Advisor, The International Office of Geosciences is there to guide you through the process. For all your practical questions, please contact international.geo@uu.nl or visit Student Affairs / International Office on the 1st floor of the Victor J. Koningsberger building. Open daily apart from Wednesdays from 10.30-11.30 and 12.30-14.30 hrs or by appointment.

Besides, please visit our study association EGEA (Buys Ballot building, room 2.74), or visit <http://www.egea.eu/entity/utrecht>. EGEA members generally have a lot of experience with studying abroad. They can help you out with a lot of practical matters (such as housing, experiences and tips & tricks).

In October and November several orientation meetings take place organised by the International Office. For more information, look for more information or dates at this website: <https://students.uu.nl/en/academics/study-abroad/faculty-information/geosciences>.

Practical matters

Once you've decided to study abroad, you can apply for an exchange in Osiris. You have to choose a top 3 of favorite universities. After selection, you will be nominated to the host university and you will receive an invitation to apply at this university. Please do keep in mind the deadlines for application! More information about how to apply and which deadline to bear in mind can be found on the website:

<https://students.uu.nl/en/academics/study-abroad>. For faculty destinations, go to destinations and select Geosciences. For the Faculty International Office website, please look here: <https://students.uu.nl/en/academics/study-abroad/faculty-information/geosciences>.

Good to know

- Eligible for studying abroad during their master are all students with formal permission from their programme coordinator. To obtain permission please use

the 'study plan for studying abroad' (available via:

<http://students.uu.nl/en/academics/study-abroad/step-2-application-at-uu>).

- After your programme coordinator has signed the study plan, upload it in Osiris
- Credits obtained at partner universities can quite often easily be transferred to your academic record in Utrecht: study abroad doesn't necessarily cause delay in your programme!
- If your destination is within Europe, either for courses (exchange) or an internship, you are eligible for an ERASMUS grant. Monthly financial support to make your study abroad easier than it already is. More information can be found on <https://students.uu.nl/en/academics/study-abroad/funding-grants/erasmus-grants>
- If your destination is outside Europe, please have a look at www.beursopener.nl and find out if you are eligible for the options mentioned.
- If you're going abroad, you'd better put your public transport (OV) student chip-card on hold (public transport card for Dutch students). By doing this, you can apply for a monthly travel allowance. Forms for this allowance are to be signed by the Student Affairs office/International Office.

2.6 Student Affairs Office Geosciences and Student Services

The *Student Affairs Office Geosciences* is the primary point of contact for students in the faculty of Geosciences. It provides students with general information and answers questions about enrolment for courses, course timetables, examinations, grades and credits, academic programme, academic progress review, exemptions, study abroad, your graduation etc.

Student Affairs Office Geosciences is situated at the **Victor J. Koningsberger building**, Budapestlaan 4a-b, Tel: +31-30-253 9559.

Opening hours: see website.

During academic holidays opening hours may be limited.

Internet: <http://students.uu.nl/en/geo>

E-mail: studentaffairs.geo@uu.nl

You can contact *Student Services* for information on a wide range of issues relating to studying and student life. This includes admission, application and enrolment, tuition fees, financial assistance, working alongside your studies, insurance, schemes and facilities for outstanding student athletes, student housing and student organisations and information about studying with a disability or chronic illness.

Contact details Student Services:

E-mail: studentservices@uu.nl (please mention your student number!)

Tel: + 31 30 253 7000 (Monday to Friday 10-12 am and 1-3 pm)

Fax: + 31 30 253 2627

Visitors' address: Heidelberglaan 6, De Uithof (Monday to Friday 10 am - 4 pm)

Postal address:

Student Services

Postbus 80125

3508 TC Utrecht

The Netherlands

For questions about ICT you can send an email to servicedesk@uu.nl.

2.7 Responsibility for the programme

Board of Studies

Within the Utrecht Graduate Division (UGD) the Master's programme Energy Science is part of the Graduate School of Geosciences, to which all Master students and PhD-students of the Faculty of Geosciences belong. The School supervises the quality of the programme and the admission of its students. All Directors of Education and Directors of Research of the Faculty of Geosciences are members of the Graduate Board of Studies, as well as a PhD student and a student from one of the MSc programmes of the Faculty. Chairman is the dean of the Faculty, prof. dr. Wilco Hazeleger.

Master Education Committee

This is a joint committee of chosen students and lecturers appointed by the dean to advise on the rules on teaching and examination and its implementation and about other matters concerning the study programmes. Its secretary is Ms. Lise van Koningsbrugge MA (l.vankoningsbrugge@uu.nl).

Board of Examiners

The Board of Examiners is responsible for the examination of students. The Board of Examiners will determine the examination results as soon as the student has submitted sufficient proof of the tests taken. This Board also decides about deviations (e.g. exemptions) in the programme and the approval of elective courses (see appendix I of this catalogue). Requests about exemptions or optional courses can be addressed to the secretary of the Board's chamber for the Copernicus Institute: (examencommissie.geo@uu.nl).

In 2020-2021 the Board of Examiners consists of:

Prof. dr. M. Rietkerk (chair)

Prof. dr. M. Gibescu

Dr. W. Vermeulen

Dr. A. Peine

L. van Koningsbrugge MA (secretary)

Teaching Institute

The Teaching Institute of the Copernicus Institute of Sustainable Development is responsible for the organisation, coordination and quality assurance of the educational elements of the various courses offered by the department. The Director of Education, prof. dr. Stefan Dekker, is the Teaching Institute's head and is assisted by a management team, which includes the programme leaders of the Bachelor's and Master's programmes. The programme's leader, dr. Floor van der Hilst is responsible for the management of the programme Energy Science.

Complaints

If you have a complaint or a suggestion, there are various courses of action available. You may opt for an informal approach: finding out whether the faculty Student Services can deal with your complaint, suggestion or comment about education and related issues. If this is not possible in the short term, it will ensure that your complaint is passed on to the appropriate person. You can also approach the person who caused the problem and attempt to reach an amicable solution with them.

If you consider the complaint to be serious enough, or if it has not been solved to your satisfaction, you can submit a formal complaint. Formal complaints are submitted using the [digital complaints form](#).

Your complaint will be dealt with by the faculty complaints coordinator.

The formal complaints procedure will then take place as follows:

- A copy of the complaint will be sent to the person to whom the complaint refers.

- The complaints coordinator in the faculty of Geosciences will ask both you and the person you are complaining about for an explanation/reaction (i.e. you will both be 'heard').
- The complaints coordinator then draws up recommendations for the Dean of the faculty.
- The Dean will consider the complaint formally.

Dealing with the complaint must take no longer than 10 weeks.

It is, of course, possible for a solution to be found during the procedure. The procedure can then be terminated.

The Geosciences complaints coordinator is Mrs. Franca Geerdes (f.geerdes@uu.nl).

More information on complaints, objections and appeals can be found here:

<https://students.uu.nl/en/practical-information/policies-and-procedures/complaints-objections-and-appeals>.

2.8 Evaluation and quality assurance

The Faculty of Geosciences values the high quality of its programmes and has therefore set up a quality assurance system. Quality assurance provides information about the quality of individual courses and the programme as a whole, study climate and students' progress and performance. Its most important goals are improving education and organization, and increasing the visibility of the quality of the programme.

One part of quality assurance with which you as a student will be dealing regularly is evaluations. Every course is evaluated afterwards and the results of this *course evaluation* are discussed in the Education committee and the Management team of the programme. Evaluations provide important information for the course coordinator and lecturers to improve his/her course. All Geosciences students are allowed to view the evaluation results of the Faculty of Geosciences on Blackboard.

During the course, we also work on improving quality. *Course feedback groups* are active in each course in order to mend any problems in an early stage. For each course, such a group consists of 4-5 students who will be meeting the lecturer in the break and will be talking about the course so far. The purpose is to find out what is appreciated, what is going well and what practical issues can be improved. This does not concern aspects which are already fixed, such as the choice of literature, set up of tutorials or class times. It is all about fine-tuning, e.g. are the lecture slides readable, can everyone hear the lecturer, has information been put on Blackboard on time, etc. In the study guide of the course you can find further information about the course feedback group in your course.

Finally, at the end of each academic year (May/June) a written *year evaluation* will be carried out among the students. The year evaluation it is not about an individual course but about issues that transcend the course, such as coherence/set-up of the programme, electives, workload and effort, level, thesis supervision, challenge, atmosphere and lecturers. The results of the year evaluation will be discussed in panel meetings with the education director, programme leaders and a student delegation.

2.9 Career perspectives and Career Services

Career perspectives

The development of sustainable energy systems is one of the Grand challenges of this century. Research institutes as well as governmental and non-governmental

organizations are active in the quest for increasing energy efficiency and more renewable energy sources. Many existing and new companies are taking up the challenge to develop new business in this area and there is already a large demand for energy and resources specialists, which will certainly increase in the years to come. Job opportunities include:

- Academic occupations: Graduates are able to find employment in the private sector (energy and gas companies, such as Shell, NAM, Gasunie, Vattenfall, Essent, Eneco); public sector (Ministry of Economic Affairs, Ministry of Environment; Tennet, Provinces, energy agencies); consultancy (Ecofys, DNV GL, Jacobs, KPMG, DHV, Arcadis) and NGOs (Greenpeace, WWF, Stichting Natuur en Milieu). Graduates can also find positions at international bodies, such as the European Union, the Environment Foundation for Africa, the Organisation of American States and the International Energy Agency.
- Scientific occupations: The programme prepares students for a Ph.D., ultimately leading to professions in scientific research. Graduates of the programme must be capable of writing a Ph.D. dissertation. Possible employers: Universities, ECN, RIVM, TNO and similar research institutes in other countries.

Alumni network

The Energy Science programme likes to stay in touch with its alumni. A LinkedIn group has been created and is named "Energy Science Alumni". Students are invited to subscribe.

The student association NRG organises alumni events regularly.

Career Services

The start of your Master's programme will also be the start of your career. Let us help you prepare for the job-market right from the beginning of your Master. With the activities of Career Services you will be prepared for the future after your graduation. Within your Master's programme job-market orientation will receive much attention in the way of company visits, guest lectures and meeting alumni. An internship will let you familiarise yourself with a company or organisation and will give you the experience of your first step on the labour market.

During your Master you can do more to discover your talents, interests and motivation by following workshops and special training programmes offered by Career Services. You can also have a meeting with a career officer and attend career days organised by Career Services.

Check the website of your Master's programme under Career Services.

The career officer of the faculty of Geosciences is Mrs. Franca Geerdes (f.geerdes@uu.nl).

2.10 NRG, the study association of Energy Science

NRG is the study association for all students involved with the master Energy Science. NRG was founded to support the contact and cooperation between its members, alumni, the University as well as companies and organisations linked to energy and sustainability.

NRG organises inspiring talks by professors and companies, excursions, and inhouse days at very interesting, energy related companies. Furthermore, the association is involved in educational quality control by taking a seat in the faculty's educational committee. Besides serious activities, NRG organises also fun and social activities such as monthly drinks, pub quizzes, and annually a study trip (Austria 2017; Spain 2018; Germany 2020). NRG also hosts and organises Utrecht Energy Day and Utrecht Energy Tours. Two energy related activities to meet with future employers and to see energy production in real life!

If you want to know more about NRG and/or you want to become a member, visit their website (nrg-utrecht.nl) or send them an email (info@nrg-utrecht.nl). To stay updated via social media, follow their [Facebook](#) and [LinkedIn](#).

Appendices

Appendix I Rules for choosing elective courses

1. Students in the Master's programme choose elective courses from another or their own Master's programme. Courses that are obligatory in the exam programme cannot be used as elective courses.
2. Honours programmes for Master's students (e.g. Young Innovators, GHIS, Leadership Programme) do not count towards the electives in the programme.
3. The student must subject in advance his elective courses to the approval of the Board of Examiners. This is not the case for pre-approved electives (see 5). The programme leader will advise the Board in this matter.
4. The Board tests the proposed elective course on the following criteria:
 - a. They must be thematically linked to the Master's programme;
 - b. The programme coordinator supports the proposition;
 - c. It concerns a course at a master level (M);
 - d. The course must be available to students of the ES programme;
 - e. If applicable: The student fulfills the entrance requirements of the course;
 - f. The course is not taught in the same period and timeslot as another course the student has selected.
5. Pre-approved electives as mentioned on the list on the Blackboard community Energy Science are *not* subject to approval by the Board of Examiners. Students can enrol for those courses via Osiris. It remains the student's responsibility to make sure he fulfils any entrance requirements and that the course does not fall in the same timeslot as another course take in the same period.
6. If the student wishes to choose a non-pre-approved elective course, he must do so by a written request (form) to the Board of Examiners and he must attach written information on the contents, the level, and the study load of the course, preferably by means of a copy of the course's description from the course catalogue. The 'Application Form Elective courses Copernicus' can be found in the Blackboard community Energy Science or it can be downloaded at http://students.uu.nl/sites/default/files/geo-iees-application_form_optional_courses.pdf.
7. The student can either ask the programme leader to sign the application form or forwards an email containing the **programme leader's approval** to the Board of Examiners. The form (and email if applicable) and the course description can be sent to Examencommissie.geo@uu.nl, f.a.o. the Board's secretary, Ms. Lise van Koningsbrugge MA.
8. Actual participation is only possible if students satisfy the course's entrance conditions; in case of doubt they should contact the course coordinator first.
9. In the programme's course schedule, room has been reserved for taking electives. However, the student is free to deviate from this planning, e.g. because he wishes to take an interesting elective course in another period. If this causes delay in his study planning, the responsibility is for account of the student! Students are therefore advised to take their electives in the reserved periods and timeslots, or use a part of the time planned for their internship and/or Master's thesis.

Appendix II Education and Examination Regulations Graduate School Geosciences 2020-2021

The Education and Examination Regulations set out the degree programme-specific rights and obligations of students on the one hand and of Utrecht University on the other hand. The University's [student charter](#) contains the rights and obligations that apply to all students.

These Regulations were adopted by the Dean of the Graduate School of the Faculty of Geosciences with the approval of the Faculty Council and the Education Committee on 12 May 2020.

This is a translated version of the officially valid Education and Examination Regulations in Dutch (Onderwijs- en Examenregeling).

SECTION 1 – GENERAL PROVISIONS

art. 1.1 – applicability of the Regulations

These Regulations apply to the teaching and examinations of the Master's degree programmes in Development Studies, Earth Sciences, Energy Science, Environmental Sciences, Geographical Sciences, Human Geography, Human Geography and Planning (research programme), Spatial Planning and Science and Innovation (hereinafter called the degree programmes) and to all students registered for these degree programmes and to all students who apply for admission to these degree programmes in the academic year 2020-2021. The degree programmes and individual Master's programmes are run by the Graduate School of Geosciences within the Faculty of Geosciences.

art. 1.2 – definition of terms

In these Regulations, the terms below have the following meanings:

- a. academic vacation periods: periods without any teaching obligations for teaching staff and learning obligations for students, as laid down in the academic calendar for the degree programmes.
- b. academic calendar: the division of the academic year periodically determined by the Executive Board
- c. the Act: the Dutch Higher Education and Research Act 1992 (Wet op het Hoger onderwijs en wetenschappelijk onderzoek 1992, WHW).
- d. Board of Studies: the Board of the Graduate School of Geosciences.
- e. component: a unit of study (course) within the degree programme, as included in the prospectus and the University Course Catalogue.
- f. course: the whole of the education and testing of a component.
- g. course guide: document specifying for each course the aim and content of the course, the exit qualifications, effort requirements (such as the attendance and test requirements) that a student must meet to achieve the exit qualifications and to qualify for a final grade, required literature, the way in which the final grade is calculated, the timetable and the instructional formats, name and availability of the course coordinator.
- h. credit: a value expressed in EC, where the study load is expressed as one credit being equivalent to 28 hours of learning. The European Credit Transfer System (ECTS) ensures that credits are comparable within Europe.
- i. degree programmes: the Master's degree programmes referred to in Art. 1.1 of these Regulations, consist of a coherent whole comprised of units of study. A Master's degree programme may include several Master's programmes.
- j. effort requirements: phrase used for all the requirements that the student must meet during a course in order to be eligible for a final grade. These effort requirements are described in the University Course Catalogue and laid down in the course guide (see above).
- k. examination: the final examination of the degree programme that is passed if all obligations of the entire Master's degree programme have been fulfilled.
- l. examiner: an assessor whose competence has been determined by the Board of Examiners of the program.
- m. International Diploma Supplement: the annex to the Master's degree certificate, which includes an explanation of the nature and contents of the degree programme (partly in an international context).
- n. period: part of the academic year, the start dates of which are laid down in the academic calendar and the number of weeks in the calendar of the degree programme.
- o. special needs contract: the contract concluded by the Director of Education (or another officer on behalf of the degree programme) and the disabled student, which lays down the necessary and reasonable facilities to which the student is entitled.
- p. student: a person who is registered at the University to take courses and/or sit the tests and final examination of the degree programme.
- q. Student Affairs Geosciences: student information desk and student progress administration unit of the Faculty.
- r. test: interim examination as referred to in Art. 7.10 of the Act.

The other terms have the meanings ascribed to them in the Act.

SECTION 2 – ADMISSION

art. 2.1 – admission requirements of the degree programmes

1. The holder of a Dutch or foreign higher education degree who possesses knowledge, understanding and skills at university bachelor's level and who demonstrates the specific knowledge, understanding and skills as specified in the programme-specific component of the degree programme concerned, can be admitted to one of the Master's programmes.
2. Selection of students is based on a review of the following core competences of applicants as specified in the programme-specific component of the degree programme concerned.

art. 2.2 – English language (for Master's Degree Programmes taught in English)

1. Registration for the degree programmes is possible only after it has been demonstrated that the requirement of adequate command of the English language is fulfilled. Deficiencies in previous education in English must be made up before the start of the degree programme by sitting one of the following tests:
 - IELTS (International English Language Testing System), academic module. The minimum required IELTS score (overall band) is: 6.5 with at least 6.0 for the component 'writing'.
 - TOEFL (Test of English as a Foreign Language). The minimum required TOEFL score is 93 (internet-based test).
 - Cambridge EFL (English as a Foreign Language) Examinations, with one of the following certificates:
 - Cambridge English C1 Advanced (CAE). Minimum score: 176 total, 169 writing.
 - Cambridge English C2 Proficiency (CPE). Minimum score: 180 total, 169 writing.
2. The holder of a university Bachelor's degree awarded in the Netherlands fulfils the requirement of adequate command of the English language.

art. 2.3 – deficiencies

1. The Board of Admissions of the Graduate School may require those applicants who do not meet the admission requirements referred to in Art. 2.1 to complete a package of courses to a maximum of 60 EC, to be taught by Utrecht University and tailored to the Master's programme concerned, in order to make up for prior educational deficiencies.
2. The Board of Admissions may establish in its decision that deficiencies must be made up within a certain period of time and prior to admission to the Master's degree programme.
3. In the event of insufficient qualitative progress and/or participation in the defined deficiency programme, the Board of Admissions of the Graduate School may exclude the student from further or repeated participation.
4. The tailored package of courses, referred to in paragraph 1, is open only to candidates who hold the nationality of an EU/EER member state or Switzerland, or do not hold this nationality but do hold a residence permit that entitles them to statutory tuition fees.
5. The Board of Admissions may deviate from the requirements referred to in paragraph 4 in special cases. In any case, special dispensation will be given to refugees with residence status and refugees with a W-card, who have applied for asylum and have not yet received a final decision on their application. Deviation from the requirements is not possible if the candidate requires assistance from Utrecht University in applying for a visa, where the university acts as a sponsor.

art. 2.4 – admissions procedures

1. Responsibility for admission to the degree programmes of the Graduate School and the various Master's programmes lies with the Board of Admissions of the Graduate School.
2. In order to determine eligibility for admission to the degree programme, the Board of Admissions will consider and evaluate the knowledge, understanding and skills of the applicant. The Board may request experts within or outside the University to assess the applicant's knowledge, understanding and skills in particular areas, in addition to a review of written documents of qualifications gained.
3. In order to determine eligibility for admission to a programme within the Master's degree programme, the Board of Admissions will examine whether the applicant meets the admission requirements referred to in Art. 2.1(1) or will meet them in time. In its review, the Board will include the applicant's core competences referred to in Art. 2.1(2), as well as the applicant's knowledge of the programme's language of instruction. On this basis the Board of Admissions will assess whether the candidate is able to achieve the exit qualifications of the Master's degree programme with sufficient effort within the nominal duration of the programme.
4. Requests for admission to one of the degree programmes and to a specific Master's programme are submitted to the Board of Admissions before 1 June. In special cases, the Board of Admissions may consider requests submitted after this closing date.
5. The applicant will receive written notification whether or not he has been admitted to the degree programme and a specific Master's programme. The possibility to appeal to the Examinations Appeal Board will be indicated in this notification.

SECTION 3 – CONTENTS AND STRUCTURE OF THE DEGREE PROGRAMMES

art. 3.1 – aim of the degree programmes

See degree programme-specific component of the degree programme concerned.

art. 3.2 – mode of attendance

The degree programmes in Development Studies, Earth Sciences, Energy Science, Environmental Sciences, Human Geography and Planning (research programme) and Science and Innovation are offered full-time. The degree programmes in Spatial Planning, Geographical Sciences and Human Geography are offered full-time as well as part-time.

art. 3.3 – language of instruction

All degree programmes are taught in English.

art. 3.4 – study load

The degree programmes in Earth Sciences, Energy Science, Environmental Sciences, Geographical Sciences, Human Geography and Planning (research programme) and Science and Innovation have a total study load of 120 credits. The degree programmes in Development Studies, Spatial Planning and Human Geography have a total study load of 60 credits.

art. 3.5 – programmes; start dates

1. The Graduate School of Geosciences offers the following Master's degree programmes and Master's programmes.

Master's degree programmes	Master's Programmes
Earth Sciences	Earth, Life and Climate
	Earth Structure and Dynamics
	Earth Surface and Water
	Marine Sciences
Energy Science	Energy Science
Environmental Sciences	Sustainable Development
	Water Science and Management
Geographical Sciences	Geographical Information and Management Applications
Human Geography and Planning	Urban and Economic Geography
Science and Innovation	Innovation Sciences
	Sustainable Business and Innovation
Development Studies	International Development Studies
Spatial Planning	Spatial Planning
Human Geography	Human Geography

The Master's degree programmes prepare students for undertaking research in one or more sub-fields of Geosciences.

2. All Master's degree programmes have one start date a year: 1 September.

art. 3.6 – components of the Master's programmes

See degree programme-specific component of the degree programme concerned.

art. 3.7 – courses taken at another Dutch research university

1. Courses provided by another Dutch research university qualify as optional programme components with the approval of the Board of Examiners. The credits and marks awarded by the other Dutch institution will be used.
2. The Board of Examiners will withhold approval if it is of the opinion that a replication of content exists in relation to courses already completed or yet to be completed by the student. In the event that courses are replicated in terms of their content, either wholly or in part, the Board of Examiners may limit the contribution of these courses to the examination through deduction of credits in proportion to the overlap.

art. 3.8 – courses taken at a foreign research university

1. Courses provided by a foreign research university qualify as optional programme components with the approval of the Board of Examiners. The Board of Examiners will decide whether these courses are at a sufficient academic level.
2. The Board of Examiners will withhold approval if it is of the opinion that a replication of content exists in relation to courses already completed or yet to be completed by the student. In the event that courses are replicated in terms of their content, either wholly or in part, the Board of Examiners may limit the contribution of these courses to the examination through deduction of credits in proportion to the overlap.
3. The degree programme will publish the procedure for contributing courses taken abroad on the student site:
 - stating at what moment and in what manner students may apply for approval for courses taken abroad;
 - giving students the option of applying for approval at such time that they have received a decision from the Board of Examiners by the start of their period abroad.
4. Conversion of credits achieved for courses taken abroad is as follows:
 - a. The credits will be taken over for courses provided by foreign universities within the European Union/European Economic Area that work with the European Credit Transfer System (ECTS) which have been approved by the Board of Examiners with regards to their content and level. Contrary to this, the Board of Examiners may decide to award a different number of credits if it is established that the credits awarded abroad do not correspond to the study hours.
 - b. The credits will be converted for courses provided by foreign universities outside the European Union/European Economic Area that do not work with the European Credit Transfer System (ECTS) which have been approved by the Board of Examiners with regards to their content and level, in accordance with the university-wide conversion table. See www.uu.nl/credit-omrekening. The Board of Examiners may deviate from this in exceptional cases.
5. Conversion of grades achieved for courses taken abroad is as follows:
 - a. Foreign grades are converted into the alphanumeric results Pass/Fail; in addition, the original grades and assessment scale will be recorded in OSIRIS. Furthermore, the original results will be printed on the International Diploma Supplement referred to in Article 6.4, stating the information from Nuffic concerning the grading scales at foreign institutions www.nuffic.nl/onderwerpen/onderwijssystemen.
 - b. The foreign university will determine where the cut-off score lies for a pass, and records in the transcript whether the student has passed.
 - c. The foreign results will not count towards the student's average final mark.
 - d. The Board of Examiners will determine whether and how foreign results will count towards determining whether the student has passed with distinction (cum laude).
 - e. These conversion rules for marks do not apply to the Joint Programme: the conversion table laid down in the cooperation agreement and contained in programme-specific component of the degree programme concerned will be used.

art. 3.9 – components taken elsewhere

1. The condition for gaining the degree certificate of the Master's examination of the programme is that at least half of the Master's degree programme is passed in components provided by Utrecht University.
2. Components passed elsewhere during the degree programme can only be incorporated in the student's examinations programme with prior permission from the Board of Examiners.
3. Exemption can be granted for components passed at an institute of higher education prior to the start of the Master's degree programme only on the basis of Art. 5.14.
4. Contrary to Art. 3.9.3., components that have been passed in a Master's degree programme at Utrecht University prior to the start of the Master's degree programme may be counted towards the student's examinations programme with the classification awarded.

art. 3.10 – actual teaching structure

The teaching structure of each course is shown in the University Course Catalogue and/or course guides and/or in the digital learning environment (Blackboard).

Students can view the timetables of the classes for which they are registered via [MyTimetable](#).

SECTION 4 – COURSES

art. 4.1 – course

All courses that are part of the degree programmes have been included in the prospectuses for the programmes and can be found at the [student site](#).

art. 4.2 – course admission requirements

See degree programme-specific component of the degree programme concerned.

art. 4.3 – registration for courses

1. Participation in a course is possible only if the student has registered for it before the deadline specified by the Board of Studies. Registration rules and closing dates will be published through the [student site](#).
2. All the courses that are listed in the University Course Catalogue will take place.
3. If fewer than 15 students register for a course, the course coordinator may decide, in consultation with the Director of Education, to offer the course in a different instructional format and/or assessment.
4. A student may register for a maximum of two courses of 7,5 EC or three courses of 5 EC per period.

5. An extra course must always be requested at the degree programme office. This extra course may only be chosen from the range of courses offered within a student's own degree programme; requests may be made only during the regular registration period.
6. If the student fails to make adequate progress on the course and/or there is insufficient capacity for a course, the Director of Education may exclude the student from registration for a third course within a single course period.
7. Subject to notification to the contrary, the student who has registered correctly and in time for a course will have a confirmed place on the course no later than 15 working days before the start of the course.
8. During the late registration days, a student may only register for the courses for which capacity is still available.

art. 4.4 – attendance and effort requirements

1. Students are expected to participate actively in the courses they registered for.
2. Besides the general requirement for the student to participate actively in the course the additional effort requirements for each component, such as attendance and test requirements, are listed in the University Course Catalogue and laid down in the course guide.
3. Students may be granted exemption from attendance for reasons demonstrably beyond their control (for instance as a result of illness or family circumstances), at the discretion of the course coordinator. Students must notify the study programme's secretariat of their absence in advance. The course coordinator may request the student to provide written evidence.
4. In the event of qualitatively or quantitatively inadequate participation, the course coordinator may exclude the student from further participation in the course or part of it.
5. Effort requirements (such as holding a presentation or writing a paper) can never expire. If students fail to meet an effort requirement in time for reasons beyond their control, they must report to the course coordinator immediately after the situation has arisen and, if instructed by the course coordinator, provide evidence of the exceptional circumstances.
6. Students who wish to apply for special arrangements with regard to effort requirements as a result of chronic illness, disability or Outstanding Student Athlete status, may submit a request to the Board of Examiners (see also Art. 7.3).

art. 4.5 – participate in courses; priority rules

1. If a course has a limited capacity, the University Course Catalogue and / or prospectus indicates how many students can register for the course.
2. Participation is only possible if the student is registered, students have priority on courses that belong to the compulsory and compulsory electives part of their study programme.
3. Apart from the general priority rule formulated in paragraph 2, admission to courses with a limited capacity will be based on the following placement rules:
 - a. students who are repeating a course because they did not successfully complete the course due to circumstances demonstrably beyond their control;
 - b. students for whom the course is compulsory or a compulsory elective;
 - c. exchange students accepted by the faculty who have registered in time under approval;
 - d. remaining students.
4. In the case of electives with a limited capacity, lots will be drawn. Students of the faculty (including accepted GEO exchange students) will be given priority over external students.
5. A student is expected to be aware of all information that is sent to the student's university email address, or that is published on the student site of the study programme and in the electronic learning environment. Information distributed in this manner is assumed to be known.

art. 4.6 – complete courses for international students before winter break

International exchange students have the opportunity to complete courses, selected by the Director of Education in period 2, before the winter break.

art. 4.7 – evaluation of the quality of education

See degree programme-specific component of the degree programme concerned.

SECTION 5 – TESTING

art. 5.1 – general

1. During the course, the student will be tested for academic schooling and on the extent to which the student has sufficiently achieved the learning objectives set. The testing of the student will be concluded at the end of the course.
2. The University Course Catalogue and/or course guide describe the effort requirements the student must meet to pass the course, as well as the criteria on which the student is assessed. In the event of a difference of opinion, the course guide will be followed.
3. The course coordinator can indicate in the course guide for at most one test component that obtaining a sufficient grade of at least 5.50 is a condition for awarding a sufficient final grade. Only in special cases and with the approval of the Director of Education, this condition can be linked to more than one test component.
4. Subject to what is stated in article 5.5. and 5.6 each test component that is part of the final assessment of a course is taken and assessed once.

5. If a student repeats a course, the last classification gained will count.
6. Should a student pass a course, but still wishes to repeat the course, the complete course must be repeated.
7. The Regulations of the Board of Examiners describe the testing process (see: [student site](#)).

art. 5.2 – Board of Examiners

1. The Dean will establish a Board of Examiners for each degree programme or group of degree programmes and will ensure that the Board of Examiners can operate independently and professionally.
2. The Dean will appoint the chair and the members of the Board of Examiners for a period of three years on the basis of their expertise in the field of the degree programme(s) in question or the field of testing, in which:
 - at least one member comes from outside the degree programme or group of degree programmes concerned, and
 - at least one member is a lecturer on the degree programme or group of degree programmes concerned.
 Re-appointment is possible. Before making this appointment, the Dean will consult the members of the Board of Examiners concerned.
3. Persons holding management positions that include financial responsibilities or who are wholly or partially responsible for Master's degree programmes are not eligible for appointment to the Board of Examiners or as chair of the Board of Examiners. These persons will in any event include the Dean, the Vice Dean, directors/heads/managers of a department, members of a department's management/governing team, members or chairs of the Board of Studies of the Graduate or Undergraduate School and the Director of Education.
4. Membership of the Board of Examiners will end on completion of the term of appointment. The chair and members of the Board may also be dismissed by the Dean at their own request. The chair and members of the Board will be dismissed by the Dean if they no longer meet the requirements of paragraphs 2 or 3 of this article. The Dean may also dismiss a chair or members found to be performing their statutory duties unsatisfactorily.
5. The Dean will announce the composition of the Board(s) of Examiners to students and lecturers.

art. 5.3 – assessment of traineeship or research assignment and thesis

1. A traineeship or research assignment will be assessed by the supervisor and also examiner in question and by one or more other internal and/or external experts.
2. Master's theses will be assessed by at least two examiners.

art. 5.4 – grades

1. Grades will be awarded on a scale of 1 to 10. The final assessment of a course is either pass or fail, expressed in numbers: 6 or higher and 5 or lower respectively.
2. The final course grade will be rounded to one decimal place. A partial course grade will never be rounded.
3. The final course grade of 5 will not have any decimal places. An average grade of 4.95 to 5.49 is a fail (5); an average grade of 5.50 to 5.99 is a pass (6).
4. The course guide sets out the way in which the final course grade is calculated.
5. Alphanumeric results are awarded in the following cases:
 - a student who is registered for a course and has not participated in one of the test modules will be given an NV (Niet Verschenen – No Show). If non-participation is for reasons beyond the student's control the student will be given an ND (Niet Deelgenomen– Not Participated);
 - a student who has not participated in all the test modules will be given an NVD (Niet VolDaan – Incomplete);
 - a student who failed to meet the condition of a sufficient minimum grade of 5,50 for a test component will be given an NVD (Niet VolDaan – Incomplete);
 - if the student has completed a module, but has not received a grade for it, he may be given a V (Voldoende – Satisfactory) as the result;
 - if the student has not completed a module but does not receive a numeric result, the student can be given an ONV (ONVoldoende - Unsatisfactory) as the result;
 - a student who has been granted exemption by the Board of Examiners will be given a VR (VRijstelling – Exemption);

art. 5.5– repeat exams: supplementary tests

1. If the student does not receive a pass grade but does receive a final grade of at least 4.00 before rounding, the student will be given a once-only opportunity to take a supplementary test.
2. If the student passes the individual supplementary test, a final grade of 6.00 for the entire course will be recorded in the student progress administration system. Partial course grades that the student has achieved will not be taken into account in establishing the final grade of the supplementary test.
3. If the student does not pass the supplementary test, the initial final grade will be entered into the student progress administration system, thus rendering all partial course grades no longer valid.
4. If the student cannot be awarded a sufficient final average grade of 5.50 or higher because the student has failed to pass one test component with the condition of a sufficient grade, the student will be given one opportunity to take a supplementary partial test. The content of this partial test serves to replace the test component for which the mandatory minimum grade of 5,50 or higher is not achieved.
5. If a supplementary partial test is adequately repaired, the grade 5.50 is assigned to the test component and the final average grade will be recalculated according to the conditions specified in the course guide.

6. If the student does not pass the supplementary partial test, the final grade NVD will be entered into the student progress administration system, thus rendering all partial course grades no longer valid.
7. The student will not qualify for a supplementary test if the student has not met all the effort requirements of the course.
8. The student will not qualify for a supplementary partial test if the student has been awarded a pass.
9. The lecturer will determine the form and content of the supplementary (partial) test.

art. 5.6– force majeure: replacement tests

1. Students who miss a test or part of a test owing to circumstances demonstrably beyond their control will be given only one opportunity to sit a replacement test. Only students reporting these circumstances beyond their control immediately after their occurrence to the course coordinator will be eligible to sit a replacement test (see also art. 4.4.).
2. The lecturer will determine the form and content of the replacement test.
3. If the student is not present at the replacement test, or fails to meet the terms of the replacement test in good time, the student will not be offered another opportunity.

art. 5.7 – type of test

1. Testing as part of a course will take place as stated in the course guide.
2. Upon request, the Board of Examiners may allow a test to be administered in a manner which departs from the provisions of the first paragraph.

art. 5.8 – oral tests

1. Only one person at a time may be tested orally, unless the Board of Examiners decides otherwise.
2. An oral test will be administered as far as possible by two examiners, for a maximum of 60 minutes.
3. Oral tests will be administered in public, unless the Board of Examiners or the examiner in question has decided otherwise in a special case, or the student has objected to this.

art. 5.9 – provision for testing in special cases

1. If not providing for an individual testing possibility would result in a 'special case of manifest unfairness', the Board of Examiners may decide to grant an individual testing possibility.
2. Requests for a special possibility to sit a test must be submitted to the Board of Examiners as soon as possible, together with supporting documentary evidence.

art. 5.10 – time limit for grading tests

1. Within 24 hours of administering an oral test the examiner will determine the grade and provide the student with a written statement of the grade awarded.
2. The examiner will grade a written or differently administered test or partial test within 10 working days of the test date, and will make this grade known.
3. If the mark is not available within this period time for reasons of force majeure, the examiner must communicate this to the student, indicating when the mark will be determined. Force majeure may only be established in consultation with the Director of Education.
4. If there is a third examiner, a new assessment period of 10 working days will commence, immediately following the first period of 10 working days. It is not possible to commence a new period following this second period.
5. Time frames for assessment do not apply during academic vacation periods.
6. The written statement of the grade awarded must inform the student of the right of inspection referred to in Art. 5.12 and of the possibility to appeal to the Examination Appeals Board.

art. 5.11 – period of validity

1. The term of validity of courses passed is eight years between test date and exam date.
2. Notwithstanding this, in case of special circumstances the Board of Examiners may, if the student requests, determine an extended validity period for a course, or impose a supplementary or replacement test.
3. Partial tests and assignments passed in a course that was not successfully completed will expire at the end of the academic year in which they were passed. Partial tests and assignments expire at the end of the period in which they were passed, if the course concerned is taught more than once per academic year.

art. 5.12 – right of inspection

1. Within 20 working days after the announcement of the result of a written test, the student is allowed to inspect the student's graded work upon request. A copy of that work will be supplied to the student on request.
2. During the period referred to in the first paragraph, the student may inspect the questions and assignments of the test concerned, as well as the standards on which the grade was based.

art. 5.13 – retention of tests

1. The assignments, answers and the work assessed in the written tests will be kept in paper or electronic form for a period of two years following the assessment.
2. The thesis and its assessment will be kept in paper or electronic form for a period of seven years following the assessment.

art. 5.14 – exemption

At the student's request, the Board of Examiners may, after consulting the examiner in question, grant exemption from a programme component if the student:

- a. has already either completed a university or higher vocational programme component which is equivalent in content and level; or
- b. has demonstrated, through work or professional experience, sufficient knowledge and skills in relation to that component.

art. 5.15 – fraud and plagiarism

1. Fraud and plagiarism are defined as an action or failure to act on the part of a student, whereby a correct assessment of the student's knowledge, insight and skills is made impossible, in full or in part.

Fraud includes:

- cheating during tests. The person offering the opportunity to cheat is an accessory to fraud;
- being in possession of (i.e. having/carrying) tools and resources during tests, such as pre-programmed calculators, mobile phones, smartwatch, smartglasses, books, course readers, notes, etc., unless consultation is explicitly permitted;
- having others carry out all or part of an assignment and passing this off as own work;
- gaining access to questions or answers of a test prior to the date or time that the test takes place;
- fabricating survey or interview answers or research data;

Plagiarism is defined as including data or sections of text from others/the student's own work in a thesis or other paper without quoting the source. Plagiarism includes the following:

- cutting and pasting text from digital sources such as encyclopaedias and digital publications without using quotation marks and referring to the source;
- cutting and pasting text from the internet without using quotation marks and referring to the source;
- using excerpts from printed material such as books, magazines, other publications and encyclopaedias without using quotation marks and referring to the source;
- using a translation of the abovementioned texts without using quotation marks and referring to the source;
- paraphrasing of the abovementioned texts without giving a (clear) reference: paraphrasing must be marked as such (by explicitly linking the text with the original author, either in text or a footnote), whereby the impression is not created that the ideas expressed are those of the student;
- using visual, audio or test material from others without referring to the source and presenting this as own work;
- resubmission of the student's own earlier work without source references, and allowing this to pass for work originally produced for the purpose of the course, unless this is expressly permitted in the course or by the lecturer;
- using the work of other students and passing this off as own work. If this happens with the permission of the other student, the latter is also guilty of plagiarism;
- in the event that, in a joint paper, one of the authors commits plagiarism, the other authors are also guilty of plagiarism, if they could or should have known that the other was committing plagiarism;
- submitting papers obtained from a commercial institution (such as an internet site offering excerpts or papers) or having such written by someone else, whether or not in return for payment.

2. a. In all cases in which fraud or plagiarism is found or suspected, the examiner will inform the student and the Board of Examiners of this in writing.
b. The Board of Examiners will give the student the opportunity:
 - to respond to that in writing;
 - to be heard.
3. The Board of Examiners will determine whether fraud or plagiarism has occurred and will inform the student of its decision in writing and of the sanctions in accordance with the stipulations of the fourth paragraph, stating the possibility of appeal to the Examination Appeals Board.
4. Fraud and plagiarism will be punished by the Board of Examiners as follows:
 - a. In any event:
 - o invalidation of the paper or test submitted
 - o a reprimand, a note of which will be made in OSIRIS.
 - b. In addition to – depending on the nature and scale of the fraud or plagiarism, and on the student's phase of study – one or more of the following sanctions:
 - o removal from the course
 - o no longer being eligible for a positive degree classification (cum laude) as referred to in art. 6.2
 - o exclusion from participation in tests belonging to the course concerned for the current academic year, or for a period of 12 months
 - o complete exclusion from participation in all tests for a period of 12 months.
 - c. In the event that the student has already received a reprimand:
 - o complete exclusion from participation in all tests for a period of 12 months.
 - d. In the case of extremely serious and/or repeated fraud or plagiarism, the Board of Examiners may recommend that the Executive Board permanently terminate the concerned student's registration for the degree programme.
5. If the Board of Examiners determines that there has been widespread or organised fraud, on a scale which would affect the test results in their entirety, the Board of Examiners will decide without delay that the test concerned is invalid and that all the participants must resit the whole test at short notice. The Board of

Examiners will set the date on which the test must be retaken. This date will be no later than ten working days after the fraud was established, so that the participants can still benefit from their preparatory work for the test.

art. 5.16 – control of plagiarism

1. For the purpose of controlling plagiarism handing in an electronic version of written assignments by the student (such as papers, theses) can be imposed as a compulsory condition by the examiner of the relevant course, whether or not they are using a designated plagiarism detection system. If the student does not submit an electronic version of the assignment in time, the assessor may decide not to assess the assignment.
2. In all cases, submitting an electronic version of the final thesis is mandatory for students.
3. By submitting a written assignment, the student gives permission in the broadest sense of the word for the control of plagiarism via a plagiarism detection system as well as for recording the written assignment in databases, to the extent necessary, for future plagiarism checks.
4. In the event that a particular course decides to disclose documents, students reserve the right not to disclose their written assignment other than for the purpose of plagiarism as referred to in paragraphs 1 and 2 of this article.

art. 5.17 – right of appeal

The student has a right to appeal decisions taken by the Board of Examiners or by examiners. The appeal must be made in writing, and explaining the basis for the appeal, to the Examination Appeals Board within six weeks of taking the test or examination, or of the decision being made, pursuant to Section 7.61 of the Higher Education Research Act 1992.

SECTION 6 – EXAMINATION

art. 6.1 – examination

1. As soon as a student has fulfilled the requirements of the examinations programme, the Board of Examiners will determine the result of the examination and award a certificate, as described in Art. 6.4.
2. Prior to determining the result of the examination, the Board of Examiners may conduct its own examination of the student's knowledge of one or more components or aspects of the degree programme, if and in so far as the results of the relevant tests give it reason to do so.
3. Assessment of the examinations file constitutes part of the final examination. The date of examination will be the last working day of the month in which the Board of Examiners has determined that the student has fulfilled all the requirements of the examinations programme. The student must be registered for the degree programme on the examination date.
4. Conditions to pass the examination are:
 - all components are passed;
 - the composition of the course package completed meets the level requirements set.
5. A further condition for passing the examination and receiving the certificate is that the student was registered for the degree programme during the period in which the tests and the final examination were taken. If the student does not fulfil this condition, the Executive Board may issue a statement of no objection in relation to the passing of the examination and the issue of the certificate, after the student has paid the tuition fees and administration charges owing for the 'missing' periods.
6. A student who has passed the examination and is entitled to a certificate may request the Board of Examiners to not yet grant the certificate and to postpone the examination date referred to in paragraph 3. This request has to be submitted within 10 working days after the student has been informed of the result of the examination. The student will indicate in this request a preferred examination date.
7. The Board of Examiners will grant the request in any case if the student:
 - a. is to fulfil a management position for which Utrecht University has provided an administrative grant
 - b. is to do a traineeship or take a component of a programme abroad.The examination date may be postponed once only, for the duration of a maximum of thirteen months.
8. After the student has passed the final examination the student can request the institution to terminate the student's registration.

art. 6.2 – cum laude classification

1. If a student has demonstrated outstanding academic achievement in the student's Master's degree programme, the degree will be awarded cum laude; this classification will be noted on the degree certificate.
2. The cum laude classification will be awarded to the Master's examination if each of the following conditions have been met:
 1. the weighted average of the grades achieved for the Master's programme components is at least 8.00 before rounding.
 2. the student has received a minimum grade of 8.00 for the Master's thesis.
 3. the student has been granted no more than 7.5 credits in exemptions that do not count towards the examination programme (1-year programmes) or no more than 15 credits (2-year programmes).
 4. No decision has been reached by the Board of Examiners regarding commitment of fraud/plagiarism that would otherwise no longer qualify for a positive classification (cum laude).
 5. the Master's examination has been passed within one and a half years (one-year degree programmes) or three years (two-year degree programme).

3. The Board of Examiners may decide to award the cum laude classification even if not all the requirements referred to in paragraph 2 are met. Such a decision must be unanimous.
4. Classifications other than cum laude will not be noted on the degree certificate.

art. 6.3 – degree

1. The Master of Science degree will be awarded to the student who passes the examination.
2. The degree awarded will be noted on the examination certificate.

art. 6.4 – degree certificate and International Diploma Supplement (IDS)

1. The Board of Examiners will award a certificate as proof that the examination was passed.
2. The Board of Examiners will add the International Diploma Supplement in the English language to this certificate, which provides (international) insight into the nature and contents of the completed degree programme.

art. 6.5 – grading tables

1. The International Diploma Supplement gives the student's cumulative average mark and an ECTS Grading Table.
2. The cumulative average mark shows the student's academic performance on a scale of 1 to 10. It is calculated based on the final results for the courses the student has successfully completed within the degree programme. Courses that are not assessed on a numerical basis are not included in the calculation. The cumulative average mark is weighted based on the number of credits for each course.
3. The ECTS Grading Table gives a clear picture of Utrecht University's marking culture for educational institutions and employers outside the Netherlands. Based on the Grading Table, they can convert the results into their own marking system. The ECTS Grading Table is an institution-wide table for all Master's Degree programmes. This table uses a ten-point scale where only the marks from 6 to 10 are shown, as only passing marks are included in the Grading Table. The marks are expressed only as whole or half points. The percentage given with each mark indicates how frequently each mark is awarded.

The ECTS Grading Table is calculated on the basis of:

1. all final passing marks in courses undertaken towards the degree, excluding alphanumerical results;
2. not weighted according to study load;
3. in the three most recent academic years;
4. of students who were registered for a Master's Degree programme at Utrecht University.

SECTION 7 – STUDENT COUNSELLING

art. 7.1 – student progress administration

1. The Faculty must record the individual study results of the students and make them available through Osiris-student.
2. Certified student progress files may be obtained from Student Affairs Geosciences.

art. 7.2 – student counselling

1. The Faculty is responsible for providing an introductory programme and student counselling to students registered for the degree programmes.
2. Student counselling encompasses:
 - encouraging students to feel part of the community;
 - supervising programme choices;
 - assisting a student to familiarise himself with the job market.
 - an introductory programme in the first week of the first semester of the first year of study
 - referring and assisting students who encounter difficulties during their studies.

art. 7.3 – disability and chronic illness

Students with special needs or chronic illness are afforded the opportunity to take classes and sit tests in the manner agreed in their special needs contracts. Requests for special needs contracts are submitted to the study advisor.

SECTION 8 – TRANSITIONAL AND FINAL PROVISIONS

art. 8.1 – safety net arrangements

In cases for which these Regulations do not provide, do not clearly provide or lead to obviously unreasonable outcomes, a decision will be taken by or on behalf of the Dean, after having heard the advice of the Board of Examiners. If, on the basis of the law, the decision falls within the competence of the Board of Examiners, the Dean will send the request to the Board of Examiners for it to settle.

art. 8.2 – amendments

1. Amendments to these Regulations will be laid down by the Dean after having heard the advice of the Education Committee and after consultation with the Faculty Council and the Education committees, in separate resolutions.
2. An amendment to these Regulations is not to be applied to the current academic year, unless it is reasonable to assume that it will not harm the interests of the students.

3. Furthermore, an amendment may not have an adverse effect for students on any other decision the Board of Examiners has taken pursuant to these Regulations with respect to a student.

art. 8.3 – publication

The Dean will publish these Regulations, as well as each amendment, on the internet.

art. 8.4 – effective date

These Regulations take effect on 1 September 2020.

Programme-specific part of the Education and Examination Regulations 2020-2021

Graduate School of Geosciences: Master's degree programme in Energy Science

The Master's degree programme *Energy Science* offers the programme *Energy Science*.

Art. 2.1 – Admission requirements

1. The following conditions for admission apply:

Admission to the **Energy Science** programme is granted to students with a Dutch or foreign diploma confirming that they have acquired the knowledge, insight and skills at the university Bachelor's level. Furthermore, students need to prove that they have gained the following specific knowledge, insight and skills:

- a) knowledge in the field of *Environmental Sciences, Science and Innovation Management, Physics or Chemistry* at the advanced level of the major *Environmental Sciences, Science and Innovation Management, Physics or Chemistry* at Utrecht University (or equivalent to that level)
 - b) knowledge of *Thermodynamics, Energy Analysis and Mathematics*
 - c) insight into *Environmental Sciences, Science and Innovation Management, Physics or Chemistry* at the advanced level of the major *Environmental Sciences, Science and Innovation Management, Physics or Chemistry* at Utrecht University (or equivalent to that level)
 - d) academic and research skills at the advanced level of the major *Environmental Sciences, Science and Innovation Management, Physics or Chemistry* at Utrecht University (or equivalent to that level)
2. Students will be selected based on objective standards regarding:
 - a) their previous academic performance in a relevant subject area
 - b) relevant skills
 - c) their command of the language or languages used in the programme

This information is used to consider whether the student concerned will be able to complete the Master's Programme successfully within the set time period.

The admission requirements have been formulated clearly and transparently so that candidates know in advance what requirements must be met in order to qualify for selection.

Art. 3.1 – Aim of the degree programme

1. The degree programme aims to:
 - provide students with specialised knowledge, skills and understanding in the field of *Energy Science* so that they can achieve the final qualifications as mentioned in Article 3.1.2
 - prepare students for professional employment in one or more disciplines of *Energy Science*
 - prepare students for training as researchers in the field of *Energy Science*
2. Graduates in *Energy Science*
 1. have advanced knowledge and understanding of the dynamics and challenges of *Energy Science* in the context of both organisations and society at large
 2. can conduct research on the dynamics and challenges of *Energy Science* in a creative and independent way
 3. can apply knowledge and research methods as well as problem-solving abilities in broader contexts related to the dynamics and challenges of *Energy Science*
 4. have insight into the complex interactions between science, innovative technology and society and are able to reflect critically on the roles of science and technology in society
 5. have professional and academic skills, particularly in relation to the dynamics and challenges of *Energy Science*
 6. can apply knowledge and understanding in such a way that they demonstrate a professional approach to their work
 7. can communicate their conclusions, as well as the knowledge, reasons and considerations underlying these conclusions, to an audience of specialists and non-specialists alike

More programme-specific qualifications are listed in the prospectus of the programme.

Art. 3.6 – Components of the Master’s programme

1. Appendices 1 and 2 describe the required courses of the programme, including the course load per course.
2. Students may choose optional courses, but these need to be approved by the Board of Examiners. The optional courses are listed in Appendices 1 and 2.
3. The prospectus gives a detailed description of the content and type of courses in the programme, including prior knowledge that is required to participate successfully.

Art. 4.2 – Course admission requirements

The Executive Board decides the order in which the required components of a Master’s degree programme must be completed. This will be published in the prospectus.

Art. 4.7 –Evaluation of the quality of education

1. The Director of Education monitors the quality of education, and ensures that both the courses and the curriculum are evaluated. The Director takes into consideration the advice and suggestions given by the Education Committee regarding improving and ensuring the quality of the programme.
2. Students are informed of the outcomes of the course and curriculum evaluations.

Appendices

Appendix 1: Exam programme Energy Science, track Systems Analysis

1. Compulsory components (52.5 EC)

-	Energy in the Context of Sustainability	7.5 EC
-	Energy conversion Technologies I	7.5 EC
-	Energy conversion Technologies II	7.5 EC
-	Advanced Energy Analysis	7.5 EC
-	Energy Systems Modelling	7.5 EC
-	Consultancy Project ES	15 EC

2. Thesis components (30 EC or 45 EC)

-	Master’s thesis	30 EC
-	Master’s thesis	45 EC

3. Optional components (22.5 EC or 37.5 EC)

Students should select optional courses for a total of 22.5 EC or 37.5 EC.

4. Conversion of former courses

Not applicable in 2020-2021

Appendix 2: Exam programme Energy Science, track Natural Science

1. Compulsory components (97.5 EC)

-	Energy in the Context of Sustainability	7.5 EC
-	Energy conversion Technologies I	7.5 EC
-	Energy conversion Technologies II	7.5 EC
-	Advanced Energy Analysis	7.5 EC
-	Energy Systems Modelling	7.5 EC
-	Master’s thesis	30 EC
-	Natural Science Research Project	30 EC

2. Optional components (22.5 EC)

Students should select natural science courses for a total of 15 EC.

Students should select other optional courses for a total of 7.5 EC.

3. Conversion of former courses

Not applicable in 2020-2021

Appendix III Regulations of the Board of Examiners 2020-2021

Regulations of the Board of Examiners adopted by the Board of Examiners for the Graduate School of Geosciences at Utrecht University, on 13 May 2020.

Valid from September 1, 2020

Preamble

The Board of Examiners of the Graduate School consists of a central Board of Examiners and three executive panels. These executive panels implement examinations policy independently, within the frameworks set by the central Board of Examiners of the Graduate School of Geosciences. The chairs of the executive panels form the central Board of Examiners of the School. The central Board of Examiners acts as a framework-setting and supervisory body. It determines examinations policy and sets the frameworks in the form of regulations and procedures. The central Board of Examiners lays down the regulations of the Board of Examiners each year. In its supervisory role it also monitors the quality of the decisions and the implementation of examinations policy by the panels.

Requests to the Board of Examiners are received centrally and are then assigned by the central Board of Examiners to the executive panels.

Requests to the Board of Examiners Board are received centrally and subsequently assigned to the executive panels.

PARAGRAPH 1 – GENERAL STIPULATIONS

Art. 1.1 – scope of application

These Regulations apply to the tests and examinations of the master study programme(s):

- Earth Structure and Dynamics
- Earth Surface and Water
- Earth, Life and Climate
- Energy Science
- Geographical Information Management and Applications (GIMA)
- Human Geography
- Innovation Sciences
- International Development Studies
- Marine Sciences
- Spatial Planning
- Sustainable Business and Innovation
- Sustainable Development
- Urban and Economic Geography
- Water Science and Management

These Regulations do not apply for PhD programmes.

The terms defined in the Education and Examination Regulations of these study programmes also apply to these Regulations.

Art. 1.2 – Board of Examiners

1. The Board of Examiners will appoint a member or official secretary from its ranks who is in charge of managing the daily course of affairs of the Board of Examiners.
2. The Board of Examiners will take decisions by an ordinary majority of votes. If the votes are equal, the student or the request is rejected.
3. The chair and all members of the Board of Examiners are authorized signatories.
4. The Board of Examiners must take a decision within six weeks of receipt of an application.
5. Decisions taken by a Board of Examiners will be recorded in minutes. These minutes will be approved, at least by or on behalf of the chair.
6. The Board of Examiners will be supported in its work by an official secretary. This official secretary will not sit on the Board of Examiners. The official secretary will:
 - prepare, convene and take minutes at the meetings;
 - monitor the implementation of decisions taken;
 - communicate decisions taken to students and other interested parties;
 - draw up regular reports;
 - archive requests processed, objections and decisions taken.

Art. 1.3 – standards

In its decisions, the Board of Examiners will be guided by the following standards:

- a. the retention of quality criteria in an examination or test;

- b. efficiency requirements, expressed *inter alia* in efforts to:
 - limit as far as possible loss of time for students, who can thereby make rapid progress which their studies;
 - encourage students to terminate their studies as quickly as possible, if it is unlikely that they will pass an examination or test;
- c. protecting students from themselves in the event that they wish to take on an excessive study load;
- d. leniency towards students who, through no fault of their own, have experienced delays in the progress of their studies.

Art. 1.4 - examiners

1. The Board of Examiners will appoint members of the academic staff charged with teaching a course as examiners. The Board of Examiners may furthermore appoint other members of the academic staff and experts outside the study programme as examiners. The examiners are responsible for the testing of the course.
2. The Board of Examiners may withdraw the appointment as an examiner in the event that the examiner fails to comply with the applicable legislation or regulations or guidelines of the Board of Examiners, or if the competence of the examiner concerning the making, administering or marking of tests repeatedly proves to be of insufficient quality.

PARAGRAPH 2 – ORGANIZATION OF TESTS AND PROPER PROCEDURE

Art. 2.1 – times of tests

1. Written tests are to be administered at times set by the course examiner at least 14 days before the start of the term in question.
2. In setting the times of the tests any overlap of tests must be prevented as far as possible.
3. Changes to times set may be made only in cases of force majeure.
4. If possible, oral tests are to be administered by the examiner(s) in question at a time set after consulting with the student.
5. The times of written supplementary and replacement tests will be determined and announced at least two weeks in advance. At least five working days will pass between the announcement of the results and the supplementary test.

Art. 2.2 – registration for tests

When registered correctly for a course, students are also signed up for the course test(s).

Art. 2.3 – order during an examination or test

1. The examiner will ensure that an adequate number of invigilators are appointed for the written examinations. These invigilators will ensure that the test proceeds properly.
2. The students must identify themselves on request by or on behalf of the Board of Examiners by valid proof of the student's identity. Admission to the test will be denied if students are unable to identify themselves.
3. The student must follow instructions of the Board of Examiners, or the examiner or invigilator, which are given before, during and immediately after the test.
4. Should the student fail to follow one or more instructions as referred to in Art. 2.3.3, the student may be excluded by the Board of Examiners or examiner from further participation in the test in question. As a consequence of the exclusion, no result will be determined for that test. Before the Board of Examiners takes a decision, at the student's request they must give the student the opportunity to be heard on the matter.
5. The duration of a test must be such that students reasonably have enough time to answer the questions.
6. Latecomers will be admitted to a test 30 minutes at most after the start of the test. If a student is prevented by force majeure from being present within this time limit, the Board of Examiners, or examiner, will decide whether the student can still be admitted to the test. Latecomers may not claim extra time for the test.
7. Students may not leave the room where the test is being administered within 30 minutes of the start of the test.
8. After one or more participants have left the room, no latecomers will be admitted to the test.
9. Students must hand over their bags, coats and electronic devices to the invigilators at the start of the test.

PARAGRAPH 3 – ASSESSMENT OF TESTS, THESIS

Art. 3.1 – marking of test

1. The Board of Examiners will ensure that written tests are to be marked on the basis of predetermined, written standards, possibly adjusted on the basis of a correction.
2. The weighting of the interim results in reaching the end result is laid down in the course manual.
3. If more than one examiner is involved in the marking of a test, the course coordinator must ensure that all examiners mark it on the basis of the same standards.
4. The manner of marking must be such that the student can check how the result of the test was reached.
5. With only one examiner present a recording of an oral test is made. In case of more than one examiner present, one of the examiners makes notes listing the topics that are being addressed and whether the students masters the subject(s). Recordings or notes are kept by the examiner for three months and can be viewed or listened to by the student who took the oral test.
6. If in the case of practical exercises several students contribute towards a single joint project, the following rules apply:
 - a. the guideline for the (individual or collective) marking of group work must be established beforehand by the lecturer and notified to the student;
 - b. the supervisor will regularly check that all students make a proportional contribution to the end product;
 - c. students may be marked individually on the basis of the work they have performed.
7. The last mark given will apply in assessing the result of a test/course.

Art. 3.2 – assessment of thesis, research assignments, graduate theses

1. The Board of Examiners will ensure that the assessment criteria for the master thesis, research assignments and essays/thesis are laid down and that these are included in the course or thesis manual.
2. If in the case of practical exercises several students contribute towards a single joint project, the Board of Examiners will use the following guidelines:
 - a. agreements on the division of tasks among the students who are to perform the work must be set out in writing by the examiner(s) responsible prior to the start of the work;
 - b. students will be marked individually on the basis of the work they have performed.
3. A master thesis must be assessed and marked by two examiners. If the first and second examiner cannot reach agreement, the Board of Examiners will appoint a third assessor who will give a binding final opinion.
4. The examiners will provide an explanation, using an assessment form, of the manner in which the final mark has been reached.

Art. 3.3 – subsequent discussion

1. As soon as possible after the result of an oral test has been announced, if a student so requests or on the initiative of the examiner, a subsequent discussion will be held between the examiner and the student, in which the examiner will give reasons for the decision.
2. During a period of 30 days, starting on the day after the results of a written test were made known, the student may request a discussion with the examiner. The discussion will be held at a place and time determined by the examiner.
3. If a collective discussion is organized, the student can submit a request as referred to in the second paragraph only if the student was present at the collective discussion and the student gives reasons for that request, or if the student was prevented by force majeure from attending the collective discussion.
4. The provisions of the preceding paragraph will apply by analogy if the examiner offers the student the opportunity to compare the answers with model answers.

Art. 3.4 – recording the final results

Final results of a course unit will be entered in Osiris following authorization by the examiner.

PARAGRAPH 4 – ASSURING THE QUALITY OF EXAMINATIONS

Art. 4.1 – assuring the quality of testing

The Board of Examiners will ensure that:

- a. a testing policy/testing plan is in place, and that this is implemented;
- b. tests are compiled in line with the learning objectives and final attainment levels for the course in question;
- c. uniform agreements are made about the way in which tests are compiled.

Art. 4.2 – determining the quality of testing

1. The Assessment Committee is charged with providing analysis and advice concerning the quality of the tests. To this end, it will test the quality of individual tests on the basis of random samples – and following complaints, evaluation of results, pass rates and suchlike – in relation to the validity (they measure knowledge, skills and competences) and reliability (are they consistent and accurate) and will inform the Board of Examiners of their findings.

2. The Board of Examiners may ask the Assessment Committee to provide information, undertake research and make proposals concerning the structure of the tests. The Assessment Committee is obliged to follow these orders. The Assessment Committee is responsible to the Board of Examiners for carrying out these orders.

Art. 4.3 – assuring the quality of examinations (final level of the graduates)

The Board of Examiners will ensure that:

- a. the exit qualifications for the course as described in the Education and Examination Regulations are translated into testable learning objectives for each course;
- b. it is systematically examined whether there is a sufficient connection between the course objectives and the final attainment levels, or the sum of the learning objectives for each course corresponds to the exit qualifications for that course.

Art. 4.4 – Board of Examiners’ own investigation to maintain quality of examination

1. A student has passed the examination if all parts of the examination programme have been successfully completed. Contrary to the above, the Board of Examiners may decide that in order to pass the examination the student must have complied with the requirements relating to the Board of Examiners’ own investigation.
2. The Board of Examiners will only conduct such an investigation if it establishes that there are certain facts or circumstances that lead to the conclusion that the Board of Examiners cannot vouch for the student having obtained the exit qualifications for the course (as referred to in Art. 3.1 of the Education and Examination Regulations).

PARAGRAPH 5 - EXEMPTIONS, APPROVAL OF COURSE UNITS

Art. 5.1 – exemption

1. Students wishing to receive one or more exemptions, must submit a request with argumentation to the Board of Examiners. The request must be signed and contain:
 - the student's name, address and student number
 - a description of the reasons on which the exemption is being sought
 - for which course(s) the exemption is being sought
 - an authenticated copy of the student’s diploma, examination results or proof of tests previously taken
 - and/or a description of the knowledge and experience the student has obtained outside of higher education, accompanied by the relevant documents showing this.
2. The Board of Examiners will submit the request for advice to the examiner(s) in charge of teaching the course(s) for which the exemption is being sought.
3. The Board of Examiners will decide within 6 weeks of the date of receipt of the request on whether the exemption will be granted. With the exception of academic vacation periods as laid down in the academic calendar and during the fieldwork period.

Art. 5.2 – approval of course units

1. Students wishing to include course units which require prior permission of the Board of Examiners on the grounds of the Education and Examination Regulations must submit a request, giving reasons, to the Board of Examiners. The request must be signed and contain:
 - the student’s name, address and student number;
 - a description of the contents, level and assessment of the courses for which approval is being sought;
 - an indication of the way in which the student wishes to include the course(s) in the education programme.
2. The Board of Examiners will submit the request, if necessary, to the programme coordinator or a specialist lecturer for the course for advice.
3. The Board of Examiners will decide within 6 weeks of the date of receipt of the request. With the exception of academic vacation periods as laid down in the academic calendar and during the fieldwork period.
4. If approval concerns course units outside UU, following their completion the student will submit a certified transcript or a summary of the monitoring of student’s progress.
5. Based on the certified transcript, course content description(s) and to request further substantiation by the student, the Board of Examiners grants course level and amount of ec to a master course outside the UU
6. If the course information (as referred to in art. 5.2.5) proves to be insufficient to determine level and ec, the Board of Examiners will grant 1 ec.

PARAGRAPH 6 – COMPLAINTS

Art. 6.1 - Complaints about testing and marking

1. The first point of contact for students with a complaint about testing and marking is the lecturer, who as the examiner is responsible for determining the result of the test. If there are several examiners for the course, the course coordinator is the first point of contact as the ‘representative’ for all examiners involved

in the test (provided that the course coordinator is also an examiner). The lecturer or course coordinator will endeavour to reach a solution in an informal manner.

2. 'Testing and marking' is understood to mean all situations where there is a formal assessment moment that leads to a mark or an alphanumerical result relating to learning objectives and exit qualifications that are laid down in the Education and Examination Regulations.
3. If the quality of the test is at issue and the complaint has implications for the result of the test, the lecturer and/or course coordinator will ensure that a quality analysis is carried out to assess whether the test meets the general quality requirements as referred to in paragraph 4. In the case of wide-ranging complaints or complex issues concerning content, third parties will be consulted if necessary, such as a specialist lecturer, a testing expert or the faculty Assessment Committee. The quality analysis will be conducted as soon as possible, preferably before the test results are published.
4. If the quality analysis reveals that the test does not meet one or more quality requirements, the lecturer and/or course coordinator may decide to adjust the marks and the standard. If the final test result has already been published, the amended result may no longer be to the disadvantage of one or more students.
5. The Board of Examiners may make use of its statutory authority pursuant to Section 7.12b (1)(b) of the Higher Education and Research Act: *'to lay down guidelines and rules from within the framework of the education and examination regulations (...), to assess and establish the result of tests and examinations'*. The lecturer and/or course coordinator will observe the guidelines and rules laid down by the Board of Examiners.

Art. 6.2 - Appeal against decisions concerning testing and marking

1. Students may submit an appeal against the decisions of examiners or the Board of Examiners to the Examination Appeals Board within six weeks of publication of the mark/alphanumerical result. See <http://students.uu.nl/praktische-zaken/regelingen-en-procedures/klachten-bezwaar-en-beroep/college-van-beroep-voor-de-examens-cbe>
2. Art. 54 of the Administration and Management Regulations of UU stipulates that a formal complaint will not be dealt with if it concerns conduct against which the person involved may lodge an appeal. Since an appeal may be submitted to the Examination Appeals Board against decisions relating to testing and marking, complaints about testing will not be dealt with according to the formal complaints procedure of Utrecht University. This means that the complaints procedure described in Art. 6.1 is not formal in nature.

PARAGRAPH 7 – FINAL PROVISIONS

Art. 7.1 – annual report

1. The Board of Examiners will draw up an annual report of its activities for each academic year and will send this to the dean.
2. The annual report will contain the following parts:
 - a. composition of the Board of Examiners
 - b. monitoring of quality of the tests and examinations (final level of the graduates):
 - description of procedures and guidelines for marking and setting standards for tests; way in which it is ascertained that these are applied;
 - description of guidelines for marking and setting standards for research assignments and theses; way in which it is ascertained that these are applied;
 - way in which and number of times that the quality of the tests has been examined.
 - c. quantitative information, numbers:
 - diplomas awarded (plus number with distinction *cum laude*);
 - requests for exemption or approval;
 - requests for a special examination dispensation;
 - cases of fraud;
 - binding study advice.
 - d. recommendations

Art. 7.2 – amendments

1. Amendments to these regulations will be laid down by the Board of Examiners in a separate decision.
2. An amendment to these regulations does not relate to the current academic year, unless the interests of the students are not harmed as a result in all reasonableness.

Art. 7.3 – entering into force and publication

1. These regulations enter into force on 1 September 2020.
2. The Board of Examiners will ensure the publication of these regulations, as well as any amendment thereto, via the internet.

Appendix IV Teaching periods Copernicus Institute of Sustainable Development 2020-2021

This holds only for Master's courses offered by the Copernicus Institute (codes GEO4-22XX, 23XX, 25XX, 26XX and 60XX); this might deviate from courses with other (GEO-)codes.

36	37	38	39	40	41	42	43	44	45
1 31/8-6/9	2 7-13/9	3 14-20/9	4 21/9-27/9	5 28/9-4/10	6 5-11/10	7 12-18/10	8 19-25/10	9 26/10-1/11	10 2-8/11
GEO Intro					Master open day			break	

46	47	48	49	50	51	52	53	1	2	3	4	5
1 9-15/11	2 16-22/11	3 23-29/11	4 30/11-6/12	5 7-13/12	6 14-20/12	Xmas break	Xmas break	Study week	7 11-17/1	8 18-24/1	9 25-31/1	10 1-7/2
			1/12 rep. 1	8/12 rep. 1								break

6	7	8	9	10	11	12	13	14	15	16
1 8-14/2	2 15-21/2	3 22-28/2	4 1-7/3	5 8-14/3	6 15-21/3	7 22-28/3	8 29/3-4/4	9 5-11/4	10 12-18/4	11 19-25/4
11/2 UU Career day	Master open day	2/3 rep. 2		9/3 rep. 2			2/4 Good Friday	5/4 Easter Monday	16/4 break	break

17	18	19	20	21	22	23	24	25	26	27	28	29
1 26/4-2/5	2 3-9/5	3 10-16/5	4 17-23/5	5 24-30/5	6 31/5-6/6	7 7-13/6	8 14-20/6	9 21-27/6	10 28/6-4/7	11 5-11/7	Break	Break
27/4 King's Day	5/5 Liberation Day	13/5 Ascension day	18/5 rep. 3	25/5 rep. 3							break	12-18/7 rep. 4
		14/5 Break	24/5 Pentecost									

Green = Dept. of SD	Red = GEO wide
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Appendix V UU-time table 2020-2021

Teaching periods

Semester I:

Period 1: Monday 31 August – Friday 6 November

Period 2: Monday 9 November – Friday 5 February

Semester II:

Period 3: Monday 8 February – Friday 23 April

Period 4: Monday 26 April – Friday 16 July

Timeslots

- A Monday morning and/or Wednesday morning
- B Tuesday morning and/or Thursday afternoon
- C Monday afternoon and/or Thursday morning
- D Wednesday afternoon, Friday morning and/or Friday afternoon
- E Monday evening, Tuesday evening, Wednesday evening, Thursday evening and/or Friday evening

Course enrolment (only via Osiris Student: www.uu.nl/osirisstudent)

For period 1: 2 June 2020 up to and including 28 June 2020

- late enrolment 17 and 18 August 2020

For period 2: 14 September 2020 up to and including 27 September 2020

- late enrolment 26 and 27 October 2020

For period 3: 2 November 2020 up to and including 29 November 2020

- late enrolment 25 and 26 January 2021

For period 4: 1 February 2021 up to and including 28 February 2021

- late enrolment 6 and 7 April 2021