Study Guide
Master's degree programme
Earth Sciences
2021 /2022

FACULTY of GEOSCIENCES

Vening Meinesz Building A
Princetonlaan 8a
3584 CB Utrecht

P.O. Box 80.021
3508 TA Utrecht

Utrecht, July 2021

Content

Part 1 – General information 5

1.1 Organisation
1.2 Guidance, advice and complaints
1.3 Student facilities

Part 2 – Master's degree programmes 15

2.1 Master in Earth Sciences at Utrecht University - overview
2.2 Programme Earth, Life and Climate
2.3 Programme Earth Structure and Dynamics
2.4 Programme Earth Surface and Water
2.5 Programme Marine Sciences
2.6 Orientation towards societal, business, and policy-making applications
2.7 Orientation towards Communication
2.8 Academic Master Water Science and Management
2.9 Year schedule and timetable

Part 3 – Courses 38

3.1 List of course modules

Part 4 – Appendix 42

1. MSc thesis guidelines and instructions 43
2. MSc Guided research guidelines 50
3. MSc Internship guidelines 55
4. Education and Examination Regulations for the Master's degree programmes 60
5. Regulations of the Board of Examiners 80

Please check the website for up-to-date information on the programme, course modules and regulations.
https://students.uu.nl/en/geo

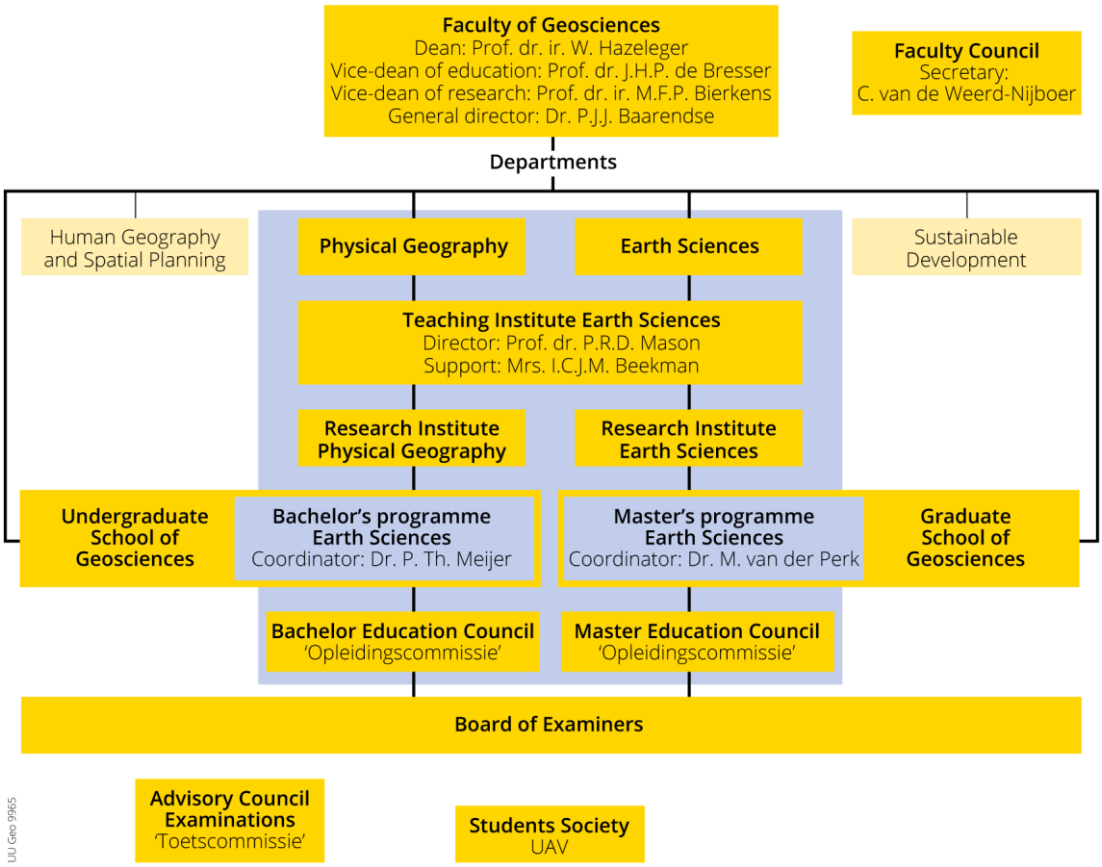
Part 1

General information

1.1 Organisation

The Master's programme in Earth Sciences is offered by the Teaching Institute Earth Sciences, a joint organisational unit of the departments of Earth Sciences and Physical Geography. The Earth Sciences Master's programme is tied to the research institutes of the two departments. In addition to the Master's degree programme, a Bachelor's degree programme in Earth Sciences is also offered by the Teaching Institute.

All Master's programmes offered by the Faculty of Geosciences form part of the Graduate School of Geosciences, chaired by the dean. The educational programme of PhD candidates also forms part of the Graduate School, but does not fall under the responsibility of the Teaching Institute. The Board of the Teaching Institute Earth Sciences consists of three members of the permanent staff and two student members, supported by a secretary. The Board is headed by the Director of Education, responsible for the overall organisation of the education including quality control. The two other staff members in the Board are responsible for the day-to-day coordination of the Bachelor's and Master's programmes, respectively. The Board is advised on issues pertaining the programme by the Master Education Council, which consists of three staff members and three student members. One Faculty-wide Board of Examiners is responsible for the quality of exams. This Faculty-wide Board of Examiners has smaller chambers dealing in detail with the separate Bachelor's and Master's programmes.



Faculty of Geosciences Board
Dean: prof.dr.ir. W. Hazeleger
Vice-dean: prof.dr. J.H.P. de Bresser (until 1 January 2022) / Prof. dr. T. Beneker (from 1 January 2022)
Vice-dean: prof.dr.ir. M.F.P. Bierkens
Faculty director: dr. P.J.J. Baarendse
Student member: M. van Dijk
Faculty office: room 5.96, VM A, Princetonlaan 8a, T: 030 - 253 2044
E: faculteitsbureau.geo@uu.nl

Faculty council
The faculty council has 16 members: 8 students and 8 staff.
Secretary: drs. C. van de Weerd-Nijboer, T: 06 8321 0460; E: c.vandeweerd-nijboer@uu.nl
Contact Student delegation: sg-fr.geo@uu.nl

Teaching Institute Earth Sciences
Chair: prof.dr. P.R.D. Mason, Tel: 030 – 253 5120
Clerk: Mrs. I. Beekman, Tel: 030 – 253 5010
Member: dr. M. van der Perk, Tel: 030 – 253 5008
Member: dr. P.Th. Meijer, Tel: 030 – 253 5091
Studentmember: R.P.A. Hagen (BSc)
Studentmember: D.J. Schreiber (MSc)
Advisor: dr. A.A. de Ronde

Education Committee
The programme's Education Committee, which comprises both students and teaching staff representatives, oversees the quality of the programme, raises any items of concern, and provide advice on the development and delivery of education policies to the Education Director.
Chair: dr. L.P.H. van Beek
Member: dr. H.E. King
Studentmember: vacancy
Studentmember: vacancy

Undergraduate School Geosciences
The Undergraduate School Geosciences includes the Bachelor's education programme offered by the teaching institutes within the Faculty of Geosciences. The Undergraduate School is led by a Board of Studies under chairmanship of prof.dr. J.H.P. de Bresser, clerk is drs. F. van der Geest.

Graduate School Geosciences
The teaching in the PhD and two-years MSc programmes at the Faculty Geosciences are integrated in the Graduate School of Geosciences. The Board of the Graduate School forms the Board of Studies which confers the MSc degrees . Members of the Board of Studies are the programme directors, the directors of education and an advisory student member. It is under the chairmanship of the dean of the faculty, prof.dr.ir. W. Hazeleger; the clerk is drs. F. van der Geest. The Board of Studies is also responsible for the curricula, quality management and admissions into the various Master's programmes. The relevant Teaching Institutes and faculty services look after the logistical organisation of Research Master educational programmes.

Board of Examiners
The Board of Examiners is in charge of examination regulations and procedures and decides on the allocation of credits, certificates, degrees. Degrees are conferred in public meetings of the board.
The board also approves minors, grants exemptions, and permission to take course modules outside the fixed curriculum of the programme. Contact with the board can be made through the Student Affairs Faculty of Geosciences or by e-mail: examencommissie.geo@uu.nl

Members of the Board of Examiners:
Chair: dr. J.A.M. Paulssen
Clerk: T.R. Bouwmeester, MA
Member: dr. F.J. Hilgen
Member: prof.dr. B.G. Ruessink
Member: dr.ir. G. Sterk
Member: dr. M. Wolthers

1.2 Guidance, advice and complaints

Planning your study: MSc coordinator, programme and profile leaders, study advisor
During the introduction, students will receive information and support for designing your personal study plan. During the rest of the year, students can contact the programme leaders, MSc coordinator, or study advisor if students need advice on their personal study plan. The names and contact information of these people can be found in section 2 of this guide.

Practical issues and specific problems: Student Services and study advisor
The Student Services Centre (Studenten service) provides you with information, advice, and services related to studying and student life, including information on scholarships, studying with a handicap, combining studying with topsport etc. Its headquarters is located at Heidelberglaan 6.
T: 030 - 253 7000
I: https://students.uu.nl/en/contact/student-services

The Study Advisor may assist you in planning your studies, making the right choices and tailoring your curriculum according to your interests and career wishes. Individual advice can be obtained if you run into specific problems that may have negative effects on your progress. This may include referral to specialist professional help.
For Earth Sciences, the study advisor is dr. A.A de Ronde, T: 030 - 253 5152, E: studyadvisor.es@uu.nl, room 120f in the Victor Koningsberger building, Budapestlaan 4b.

Coming from abroad or studying abroad: The Geosciences International Office
The aim of this office is two-sided: firstly to help the faculty's international students during their time in Utrecht with practical problems relating to their studies here (visas and housing registration). Secondly, the office assists students who want to go abroad for a period during their studies. This can be either on exchange or to do part of their thesis abroad.
The International Office has contacts all over Europe and some beyond Europe. The office is also the place where students should come to if they wish to apply for travel scholarships and to get information on where to obtain scholarships from. You should keep in mind that there are very few scholarship possibilities if you go abroad for a period of less than 3 months!
If you are thinking of going abroad for your studies please contact the International Office as soon as possible but at least six month before you want to leave. You can contact the International Office. Visiting address and hours: Monday, Tuesday, Thursday and Friday from 10.30-11.30 and 12.30-14.30 hours (or can be visited on appointment) at Student Affairs Geosciences (first floor Victor J. Koningsberger building),T: 030-253 9559, or send an email to: international.geo@uu.nl.

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 your through the process. For opening hours see: https://www.uu.nl/en/organisation/faculty-of-geosciences/contact-information/contact-information-for-students . It is also possible to make an appointment by email: international.geo@uu.nl.
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 or dates please look 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 https://www.wilweg.nl/beursopener 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.

Scientific integrity

You can address any questions or complaints about academic integrity to the Academic Integrity Counsellor. Prof.dr. Liesbeth Woertman. She can be reached by phone: 06 5122 4293 or by sending an e-mail to: vertrouwenspersoon-wi@uu.nl. The Counsellor attempts where possible to mediate between the parties involved in the complaint or otherwise reach an amicable resolution. He can also advise people to submit an official complaint to the Committee for Academic Integrity.
More information see also: https://www.uu.nl/onderzoek/onderzoek-aan-de-uu/kwaliteit-en-integriteit/wetenschappelijke-integriteit.
Prof.dr. Martin Wassen is the Academic Integrity Counsellor for the faculty of Geosciences. He can be reached by phone: 030 253 5764 or by mail via m.j.wassen@uu.nl . His office is 8.68 in the VMA building, Princetonlaan 8a. More information can be found on: https://intranet.uu.nl/vertrouwenspersoon-wetenschappelijke-integriteit .

Complaints, objections, or appeals

If you experience misconduct, if you have a complaint or if you want to submit an appeal, procedures and contacts can be found at: https://students.uu.nl/en/practical-information/academic-policies-and-procedures/complaints-objections-and-appeals/faculty.

1.3 Student facilities

Student Affairs Geosciences
Student Affairs is the primary port of contact for students in the faculty of Geosciences. It provides students with general information and answers questions about registration for courses, course timetables, examinations, grades and credits, etc.
Student Affairs Geosciences is situated at the first floor room 120 at the Victor J. Koningsberger building, Budapestlaan 4b. E: studentaffairs.geo@uu.nl .
Visiting hours: https://www.uu.nl/en/organisation/faculty-of-geosciences/contact-information/contact-information-for-students .

Career Services
The start of your master program will be the start of your career as well. Your master programme will prepare you very well for the labour market in view of professional knowledge and skills. Career Services will support you in planning your future career and help you in optimizing your curriculum in view of your career plans.
As part of your master programme you orientate yourself about the labour market by company visits, guest lectures and meeting alumni. In an internship you can familiarise yourself with a company or organisation and it will give you the experience of a first step on the labour market.
During your master you can discover your talents, interest and motivation by following workshops, special training programmes, meeting with a career officer and attend career days organized by Career Services.
Check the website of your master programme under Career Services.
The career officer of the faculty of Geosciences is drs. Franca Geerdes (f.geerdes@uu.nl).

The Faculty's Student Organisations
The faculty of Geosciences has a long-standing tradition of hosting student organisations. These organisations arrange extra-curricular activities that encourage the social networking of their members and act as a special-interest group in the interaction between the educational and faculty boards. All student organisations offer books and other literature at discounted prices. As these discounts are more than the organisations' joining fees, membership is almost a hundred percent. A substantial number of the members are active in organising and participating in activities including conferences, seminars, study tours, theatre, music, sports and parties.
Increasingly, the student organisations cooperate in arranging joint activities. They also play a major role in the introduction of new students, helping them to find their way around the faculty and the university. The student organisations are linked to the different academic programmes within the faculty. Further information can be found on each organisation's website.

Earth Sciences:
- Utrechtse Aardwetenschappen Vereniging (UAV)
  Address: Princetonplein 5, 3584 CC Utrecht, room 2.62,
  T: 030 253 2019; E: uav@uu.nl; I: http://www.uavonline.nl

International:
- European Geography Association (EGEA), Buys Ballotgebouw, Address: Princetonplein 5, room 2.74, T: 030 - 253 9708, E: Egea@uu.nl, I: *http://www.egea.nl/Utrecht*
- Association des Etats Généraux des Etudiants de l'Europe (AEGEE) (*http://www.aegee-utrecht.nl*)
- Utrecht Erasmus Student Network (ESN) (*http://www.esn-utrecht.nl*)
- Studentenvereniging voor Internationale Betrekkingen Utrecht (SIB) (*http://www.sib-utrecht.nl*)

Osiris Student
OSIRIS is the Utrecht University student records system that contains all data related to degree programmes, students, examinations and examination results. OSIRIS Student is the student version. You can use OSIRIS Student to change your address, register for courses and tests, view your timetable, and request an overview of your grades.

Blackboard
Blackboard is a web-based learning environment that offers course information through the internet. It provides components such as lecture notes, documents, assignments, tests, grades, surveys and discussion forums. It also allows the digital submission of assignments. However, these components are not necessarily included in every course. The degree to which Blackboard is used depends on which courses you are taking.
Blackboard is accessible through http://students.uu.nl/blackboard . To log in, enter your username (your Solis ID) and the password that relates to this username.

Solis-mail (email)
Utrecht University offers all students a solis-mail address. As a new student, you will receive an email with your personal data at your private email account. The faculty uses this email address to communicate information. Students are thus required to check their inbox regularly **(daily)**.
Your university email address is a combination of your name (initials and last name) with the addition:@students.uu.nl.
See also: https://students.uu.nl/en/practical-information/it-facilities/

Course Schedule
Utrecht University has two main channels that allow you to look into the schedule of your course: the MyTimetable website and the MyUU app. The schedules are published on those channels two 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.
The **MyTimetable** webste can be found on https://mytimetable.uu.nl. Along with a clear representation of the schedule, it is also possible to synchronise your own schedule with your diary.
The **MyUU-app for your smartphone can be downloaded from the Google Play store (Android) or the App store (Apple-iOS)**. Download this application and always have your schedules and grades from Osiris at hand.

ICT services
Up-to-date-information on ICT services provided by Utrecht University can be found at: http://students.uu.nl/en/practical-information/it-facilities .

Studyspot
Studyspot is a useful tool to find an available workspace with a PC in one of the university buildings: http://studyspot.uu.nl/.

Libraries
Check the internet for more (up-to-date) information: *http://www.library.uu.nl*.
- Library Complex Uithof
  Heidelberglaan 3 (opposite to W.C. van Unnik building)
  Opening hours: Monday to Friday 08.00-22.30h, Saturday and Sunday 10.00-22.30h.
- Library City Centre
  Drift 27, Utrecht (also access via Wittevrouwenstraat 7-11).
- Opening hours: Monday to Friday 08.00-22.30h, Saturday and Sunday 10.00-22.30h.

Please note: On public holidays the library is open from 10.00-18.00h and during exam periods the library has longer opening hours, giving students more time to prepare for their exams.

Map Collection
The faculty has a large collection of maps and atlases. Most of this collection can be found in the Central Library at Heidelberglaan 3 in the Uithof room 6.29 of the UBU.
See also at: https://www.uu.nl/universiteitsbibliotheek.

Purchase of Books
Members can purchase course books and materials with a discount through the student organisations. Contact the student organisations for more information. (See "Student Organisations" for addresses.)

Readers on demand
On uu.xeroxwebwinkel.nl you can order and pay for your reader online. You can choose for the reader to be delivered at your home address. To do so, choose 'shipping' in the shopping cart page. You can also choose ''pick-up" and pick your reader(s) up at the 'Repro'-desk in the HU building, Bolognalaan 101. You will find the Repro on the ground floor of this building. It is opened Monday to Friday, 8.30-17.00h.
Please note that printing the readers takes some time, so place your order as soon as possible to make sure that you receive your reader(s) in time.
If you run into technical problems ordering the reader, please contact Xerox: ddcu@hu.nl
If you have questions about the content of the reader, contact studentaffairs.geo@uu.nl

Photocopying, scanning and printing facilities
Photocopying, scanning and printing facilities are located at various points in Buys Ballot building, Victor J. Koningsberger building, W.C. van Unnik building and Ruppert building. You can also find these facilities in the libraries. Please visit https://students.uu.nl/en/printing-photocopying-and-scanning for detailed information.

Parnassos
The Cultural Student Centre 'Parnossos' organises various cultural activities. You can participate in courses, workshops and film programmes or you can visit book markets and exhibitions.
You can find the centre in Kruisstraat 201.
Internet: http://students.uu.nl/en/parnassos-cultural-centre
E-mail: info.parnassos@uu.nl

Olympos
Sportcentrum Olympos is the sports centre on the Utrecht Science Park. It is located at the Uppsalalaan 3 and offers a large variety of facilities, courses, and other activities.
Internet: www.olympos.nl
E: info @olympos.nl

Part 2

Master's degree specialisation programmes

2.1 Master in Earth Sciences at Utrecht University - overview

The degree: The Master's degree programme in Earth Sciences is a two year programme. Students have to earn 120 credits (EC) according to the European Credit Transfer System (ECTS). The credits are divided roughly equally between course modules, research and, optional, internship. As quantitative methods are widely used in the programme, a sound background in mathematics and natural sciences is required.

Within the Master's degree programme in Earth Sciences four research Master's degree specialisation programmes are offered:

- **Earth, Life and Climate (ELC)**
- **Earth Structure and Dynamics (ESD)**
- **Earth Surface and Water (ESW)**
- **Marine Sciences (MRS)**

Themes

Main themes in the four programmes are I) processes in the deep Earth and their coupling to geological phenomena at the Earth's surfaces (ESD), II) climate change and interaction between biosphere and geosphere (ELC), and III) rivers, coasts, and the interaction between hydrosphere and geosphere (ESW) and IV) physical, chemical, biological, and geological processes taking place in seas and oceans (MRS).All these themes are related to one of the strategic research themes of Utrecht University: Pathways to Sustainability.

Aim

The Master's degree programmes in Earth Sciences first and foremost aim to prepare students for a career in research in academia, industry or government. The programmes encompass a set of programme-related course modules with a credit load of at least 45 EC, elective courses with a credit load of up to 15 EC and an individual MSc research project with a credit load of at least 30 EC and a second individual project (Guided Research or Internship) with a credit load between 7.5 and 30 EC. The possibly remaining credits of the programme can be earned from one or more elective courses, which may also include a third individual research project. Orientation on a career in a more applied direction can be gained from elective courses focusing on management and society or communication and education. See the next sections in this Study Guide, the Education and Examination Regulations ('OER'), or contact your programme leader or Master coordinator for further details.

The study path: Keeping the diverse interests of the students in mind, a total of twelve recommended study paths or tracks have been formulated. Tracks are recommended, coherent combinations of courses from the programme. They are meant to help students designing their own curriculum and they facilitate specialization within the programme and to avoid scheduling conflicts.

Every individual study path has 8-10 course modules on offer. Out of this offer, 2 programme-broad courses are compulsory. Every student in the ELC, ESD, or ESW programme selects at least one of these programme-broad courses from the 'research instruction' bloc. In addition to passing one of the listed courses the student has to attend at least 10 scientific presentations/ symposia/ seminars offered by the Departments of Earth Sciences and Physical Geography, and their research groups. Eligible presentations can be found on the agenda on Blackboard where students can also register for the presentations. It is the responsibility of each student to maintain a portfolio in which the student keeps track of the attended presentations/symposia/ seminars and writes a short summary of the event and its content.

Furthermore, a student has to select at least 4 courses from the complete offer of the programme. The chosen programme results into a "professional profile" depending on the selected specific course modules in combination with the Master thesis and the student's career aspirations.

The structure: The study structure is flexible, with the following general form:

Year	Period 1	Period 2	Period 3	Period 4
1	Course modules 1 and 2	Course modules 3 and 4	Course modules 5 and 6	Course modules including Field research instruction
2	Independent research (30-45 EC) (may be field based). and Internship (15-30 EC) and/or guide research (7,5-30 EC)			

PLEASE NOTE: Students have to perform, at least, **two unique individual projects during their study**: The Graduation Research project (master thesis) and a Guided Research project or an Internship. The latter two types of activities have in common that the student prepares an unique individual report, written in English, at the end.

The personal programme: A choice for a specific programme / study path does not restrict the student to a narrow field. Depending upon interest and ability, the student can prepare a custom-made individual curriculum within the constraints of the various minimum requirements , keeping in mind the schedules of the course modules and, if any, pre-requisites.
***Note*:** Whether standard or custom-made, every student is required to submit his or her personal study programme, in consultation with the programme leader - *within 30 days of the start of the study*, for approval by the Board of Examiners. This programme may be modified later - again in consultation with the programme leader - and subject to the approval of the Board of Examiners.

In any case, the programme has to fulfil several minimum requirements:

- A minimum of 120 EC in study load
- At least 45 or 60 EC of course modules depending on profile
- A graduation research of at least 30 EC
- At least one extra individual project such as an Internship or a Guided Research Project

The graduation research (Master research/thesis): This represents the culmination of the study, and provides the proof of the capability of the student to formulate and carry out (semi) independent research. It determines - to a great extent - the specialisation of the student within the broad spectrum of the study available. The guidelines for performing the MSc research can be found in appendix 1.

Guided research: A Guided Research is similar to a Graduation Research (MSc project) but, in comparison to the Graduation Research, the expectations regarding the autonomy and independence of the student in a Guided Research project are lower. This applies particularly to developing the research objectives and methodology. Furthermore, an oral presentation of the results is not obligatory and not part of the assessment. A Guided Research project can be performed externally at another academic or non-academic institution. The credit load of a Guided Research can vary between 7.5 and 30 EC. Please visit the 'Final research assignment, thesis and internship' menu of your programme on http://students.uu.nl in order to learn more about the organization of Internships and to find related guidelines. See also appendix 2.

The internship: Although not mandatory, on-site training is considered to be an important part of the academic grooming. The credit load of an Internship can vary between 15 and 30 EC. An internship is usually performed at an institution or company outside UU, typically from the non-academic sector. In an internship, the focus lies on a) analysing a technical, economical or societal problem regarding its

earth scientific aspects; b) develop and apply earth scientific methods and expertise to tackle this problem c) document the results in a report and transfer the knowledge to the host institution. The initiative for setting up an internship rests with the student, but there is a coordinator for help and advice: dr. Rob Govers, r.govers@uu.nl . Every such training has to be pre-approved by the Board of Examiners, based on a proposal (including time schedule) submitted by the student and supported by a proposed supervisor from the academic staff. Please visit the 'Final research assignment, thesis and internship' menu of your programme on http://students.uu.nl in order to learn more about the organization of Internships and to find related guidelines. See also appendix 3.

Rules & regulations: The full set of rules regarding admission, exams etc. are not included here. The official documents containing the Rules & Regulations governing the Master's degree in Earth Sciences can be accessed at: https://students.uu.nl/en/geo . See also appendix 4 and 5.

Competence profile of a Master degree in Earth Sciences at Utrecht University

Once you have completed one of the Research Master's degree specialisation programmes in Earth Sciences, you will have

- advanced knowledge of features and processes in the field of the programme, covering a wide range of scales and time frames;
- the ability to think/develop/apply original ideas in a (semi) research context;
- the ability to apply knowledge and understanding, and problem-solving abilities in broader context, related to the field of the programme;
- the ability to integrate/interpolate/extrapolate knowledge at a high level, including information gathered from research-articles;
- a professional and critical attitude towards social/environmental/ethical aspect of knowledge acquired and competencies gained;
- expertise in the field of understanding/modelling/simulating of key underlying processes in the field of study;
- general listening/writing/presentation skills, in English, also for non-specialist audiences;
- group/team/interpersonal skills;
- the ability to pursue (advanced) research in a (sub) field.

Once you have completed the Academic Master's degree programme Water Science and Management, you are able to:

- analyse technical and societal issues, and the relations between them, relevant to contemporary and future water management aimed at sustainable development;
- understand, and perform basic calculations on, natural and technical processes related to water quantity and water quality issues;
- design, carry out and report on scientific research on the issue of water management in a creative and independent way;
- engage in a scientific, social and administrative debate on the issue of water management;
- communicate on the issue of water management verbally and in writing to a wide audience of water specialists and non-specialists alike.

Employment opportunities: Graduates of one of the Earth Sciences Master's degree specialisation programmes are well qualified to take up positions in industry, governmental organizations, consultancy, or academic research. Former graduates have generally found employment quickly, both nationally and internationally. Important employment sectors include resource exploration and production (e.g., geo-energy), environmental monitoring and protection, geological risk assessment and earth observation, geotechnical engineering and waste management, coastal and river management, land planning, water management, and museums of science of natural history. However, graduates are well qualified to move into virtually any sector where broad academic training is a requirement. About one/third of the Utrecht Earth Sciences Master graduates go on to do a PhD,

usually at Utrecht or elsewhere in Europe, the United States or Australia.

Useful contacts:

- *Master Coordinator:* dr. Marcel van der Perk (E: M.vanderPerk@uu.nl, T: 030 - 253 5565).
- *Study Advisor:* dr. A.A. de Ronde (E: studyadvisor.es@uu.nl, T: 030 - 253 5152).
- *Education information desk*: Mrs. Ingrid. Beekman (E: I.Beekman@uu.nl, T: 030 – 253 5010).

2.2 Programme Earth, Life and Climate

https://students.uu.nl/en/geo/elc

Programme leader: prof.dr. Luc Lourens (L.J.Lourens@uu.nl)

Earth, Life and Climate is an interdisciplinary programme combining biology, geochemistry and earth sciences. The programme focuses on 'System Earth' as a whole, studying the fundamental processes that drive natural systems, in particular those with a strong impact on the biosphere and biodiversity and the processes that determine the structure and evolution of natural environments at the Earth's surface, including soils, sediments, lakes, groundwater, wetlands, estuaries and oceans.

The focus is on the interaction between communities of living organisms and the changing lithosphere, hydrosphere and atmosphere. Some of these interactions can be studied directly in experiments and present-day environments. Other processes have to be reconstructed from sedimentary records.

The Earth, Life and Climate programme aims to combine the knowledge of past and present environments to analyse future threats that could endanger our global system. The impact of human activity on the climate and the environment is also studied, with the aim of developing strategies for dealing with these man-made perturbations.

Study paths:

Biogeosciences and evolution: The evolution of living organisms is heavily affected by changes in the hydrosphere, atmosphere and lithosphere. These changes, in turn, are often caused or modulated by the activity of biota. This study path focuses on understanding the interrelationships between the evolution of the biosphere end the geosphere.
Professional profile: Geologist / Biogeologist / Sedimentologist / Paleontologist

Climate reconstruction: The main focus of Climate reconstruction is on interpreting the fossil record of climate changes in Earth's history. The goal is to identify external and internal driving forces for climate changes in the past and to understand the response of System Earth to these forces. This knowledge will form a basis for predicting future climate changes and evaluating the consequences of measures to counteract these changes.
Professional profile: Geologist / Biogeologist / Sedimentologist / Paleoclimatologist

Biogeochemistry: The chemical composition of groundwater, sediments, soils and other Earth compartments are controlled by interacting biological and chemical processes. The Biogeochemistry track combines courses that allow you to obtain profound qualitative and quantitative understanding of these processes. You will become prepared to interpret and predict the biogeochemical dynamics of natural en engineered environments. ***Professional profile: Geochemist***

Integrated stratigraphy and sedimentary systems: This study path seeks to understand the role of sedimentology and stratigraphy in reconstructing System Earth and basin-fill histories. It focuses on high-resolution age control, on processes that induce production, transport and deposition of siliciclastic and carbonate sediments. Over geological time scales, sedimentary systems are controlled by climate, tectonics and sea level, as well as by autocyclic processes. The history of cyclic variations and changes in these controls is intimately reflected in the sedimentary record. Predicting the occurrence and reservoir size of fossil fuels and other natural resources is based on this understanding of the dynamics of sedimentary basin fills. This knowledge also contributes to predicting the effects of future climate change on the Earth and society.
Professional profile: Geologist / Biogeologist / Sedimentologist / Stratigrapher

Admittance

For details regarding the admission to the programme please refer to the Teaching and Examination Regulations which can be found under 'Study Regulations' of the respective programme on students.uu.nl. Students with a Bachelor in Earth Sciences, or a Bachelor in Biology with an emphasis on Biogeology (or an equivalent qualification), or a Bachelor's degree from University College Utrecht are invited to apply to the programme Earth, Life and Climate of the Master Earth Sciences.
Admission to the programme is generally given to students with an Earth Sciences Bachelor's degree who successfully completed at least two out of three (or four) Utrecht Bachelor courses (or equivalent courses) listed in the table when aiming at following the related study path. That is, the listed courses provide advisable background knowledge for the MSc courses assigned to the study path.

Biogeosciences and evolution	GEO2-1215 Paleoecology – fauna; GEO2-1218 Paleoceanography; GEO3-1319 Sedimentation and basin stratigraphy.
Climate reconstruction	GEO2-1218 Paleoceanography; GEO3-1319 Sedimentation and basin stratrigraphy;GEO3-1329 Paleoclimatology; GEO3-4303 Quaternary climate and global change.
Biogeochemistry	GEO2-1218 Paleoceanography; GEO3-1308 Geochemical processes Earth's surface; GEO3-4301 Soil and water pollution.
Integrated stratigraphy and sedimentary system	GEO2-1218 Paleoceanography; GEO3-1319 Sedimentation and basin stratigraphy; GEO3-1329 Paleoclimatology; GEO3-4303 Quaternary climate and global change.

You may be eligible for admission if you have an *HBO-diploma* or a Bachelor's degree other than the ones mentioned above. Your application will be evaluated on an individual basis.
In case of deficiency, the Admissions Committee may decide to oblige a student to use part of the free space (free choice) in the programme for deficiency courses. See the Education and examination regulations of the Master's degree programme.

Programme structure

The table lists compulsory and recommended course modules per study path. It is compulsory to follow the Research Instruction Earth, Life and Climate including a course module and attendance at 10 or more scientific presentations / seminars scientific presentations/ symposia/ seminars offered by the Departments of Earth Sciences and Physical Geography, and their research groups.

	MASTER OF SCIENCE IN EARTH SCIENCES, Utrecht University			
PROGRAMME	**EARTH, LIFE AND CLIMATE**			
PROGRAMME-BROAD COURSES At least 1 from each bloc	**Earth, Life and Climate**: GEO4-1412 Astronomical climate forcing and time scales; GEO4-1440 Microbes and biogeochemistry			
	Research Instruction Earth, Life and Climate: < GEO4-1430 Field research instruction Geology or GEO4-1431 Field research instruction Geochemistry or GEO4-4418 Master excursion Earth Surface and Water or GEO4-1454 Ice ocean climate interactions > plus seminars and career development activities			
Recommended study path	**Integrated stratigraphy and sedimentary systems**	**Climate reconstruction**	**Biogeosciences and evolution**	**Biogeochemistry**
At least 4 courses from the complete offer of the programme	GEO4-1405 Paleoceanography and climate variability	GEO4-1405 Paleoceanography and climate variability	GEO4-1419 Dynamics of sedimentary systems	GEO4-1417 Advanced mineralogy: minerals as materials
	GEO4-1418 Dynamics of basins and orogens	GEO4-1419 Dynamics of sedimentary systems	GEO4-1420 Organic Geochemistry	GEO4-1420 Organic Geochemistry
	GEO4-1419 Dynamics of sedimentary systems	GEO4-1420 Organic Geochemistry	GEO4-1422 Evolutionary paleobiology and proxies	GEO4-1421 Reactive transport in the hydrosphere
	GEO4-1438 Paleomagnetism	GEO4-4409 Reconstructing Quaternary environments	GEO4-1439 Aquatic and environmental geochemistry	GEO4-1439 Aquatic and environmental geochemistry
	GEO4-4436 River and delta systems	GEO4-4423 Climate change, hydrology and the Cryosphere	GEO4-1514B Vertebrate evolution (tetrapods)	GEO4-1443 Stable isotopes in Earth Sciences
0 to 2 courses from all programmes in the master's Earth Sciences	0 to 2 courses from all programmes in the master's Earth Sciences			
Professional profile	Geologist / Biogeologist Sedimentologist Stratigrapher	Geologist / Biogeologist Sedimentologist Paleoclimatologist	Geologist / Biogeologist Sedimentologist Paleontologist	Geochemist

Graduation research and an internship or guided research project will largely fill the second Master year. However, the student may include additional short research projects, seminars, workshops etc. in the programme of the 2nd year. This has to be discussed with the programme leader and approved by the Board of Examiners.

Note: Students have to perform at least two individual projects during their study. The graduation research project and a guided research project or an internship. The latter two types of activities have in common that the student prepares an individual report written in English at the end.

Important regulations

- The course Field research instruction Geology (GEO4-1430) is open to students with background knowledge sufficient to give a good chance of successful completion of the course. This will be assessed on the basis of the personal study plan of the student, approved by the student's advisor. The study plan should contain an overview of previous field experience as well as details of the relevant Master course modules to be followed preceding the field course module.
- See appendix 1 for guidelines starting the Master's graduation research project.
- To participate in GEO4-4418 Master excursion Earth Surface and Water, students must apply before January 15th, and pay € 100,- in advance; potential participants are notified by email in December.

2.3 Programme Earth Structure and Dynamics

https://students.uu.nl/en/geo/esd

Programme leader: dr. André Niemeijer (a.r.niemeijer@uu.nl)

Earth Structure and Dynamics programme addresses the composition, structure and evolution of the Earth's crust, mantle and core. It links geological, geophysical, geochemical and geodetic observations made at the Earth's surface to physical processes operating within the planet.

The programme can be seen as combining physics, chemistry, mathematics, geology and field studies to address how the Solid Earth works. It allows specialization in virtually any aspect of Solid Earth Science, ranging from theoretical geophysics to pure geology or geochemistry, with many students choosing a combined geology-geophysics focus.

Core areas of teaching and research include seismology, tectonophysics, mantle dynamics, structural geology, metamorphism, magmatic processes, sedimentary basin evolution, properties of Earth materials, sustainable, unconventional and conventional geo-resources. Processes addressed range from slow geodynamic processes, such as mantle convection, plate tectonics and mountain building, to those having an impact on human time scales. These include for instance active crustal deformation, seismicity and volcanism, as well as subsidence, uplift and seismicity induced by hydrocarbon production, geological storage of CO2, geothermal energy and applied mineral physics topics.
Students work at scales ranging from satellite imagery and field observations to laboratory experiments and petrographic studies, and from global seismic tomography to electron microscopy. Observational data are linked to the Earth's internal structure and to geodynamic processes through modelling, using the latest theoretical, physical, experimental and computational methods.

Study paths:

***Basins, orogens and the crust-lithosphere system*:** This study path combines courses to create a hybrid Geology-Geophysics study path addressing the evolution of basins, orogens and the crust-lithosphere system in the context of plate tectonics. It is aimed at students seeking to combine observational and field-based geological analysis with quantitative aspects of geophysics. Courses and research primarily cover the fields between the Physics of the Solid Earth and the Earth Materials study paths.
Professional profile: Geologist / Geophysicist

***Earth materials*:** Courses address the physics and chemistry of rocks, minerals and melts, and how the behaviour of these materials controls geodynamic processes. Research ranges from unravelling orogenic and volcanic events to exploring Earth's early history, the origin of geological resources, mantle rheology, rock mechanics in natural and induced seismicity, the response of crustal rocks to geological storage of CO_2, energy conversion, as well as applied, environmental and medical mineralogy.
Professional profile: Geologist

***Physics of the solid Earth and planets*:** This study path adopts an in-depth geophysical approach to understanding the structure, composition and dynamics of the deep solid interior of the Earth and other planets. Courses address seismology, the dynamics of the mantle and lithosphere, geopotential fields, and applied geophysics, as well as state-of-the-art computational methods. Research covers the entire spectrum of geophysics from seismic tomography to geodynamic modelling of plate-tectonic processes and associated surface deformation and seismicity.
Professional profile: Geophysicist

Admittance

For details regarding the admission to the programme please refer to the Teaching and Examination Regulations which can be found under 'Study Regulations' of the respective programme on students.uu.nl. Students with a Bachelor in Earth Sciences, or a Bachelor (university or HBO) in any of the Natural or Engineering Sciences, or a Bachelor's degree from University College Utrecht are invited to apply for the programme Earth Structure and Dynamics. Admission to the programme is generally given to students with a Bachelor's degree who successfully completed at least two out of four (or five) Utrecht Bachelor courses (of which at least one level three) or equivalent courses listed in the table when aiming at following the related study path. That is, the listed courses provide advisable background knowledge for the MSc courses assigned to the study path.

Basins, orogens and the crust-lithosphere systems	GEO2-1206 Lithosphere dynamics; GEO2-1208 Sedimentary systems; GEO3-1302 Continuum mechanics and rheology; GEO3-1313 Geodynamics
Earth materials	GEO3-1302 Continuum mechanics and rheology; GEO3-1304 Structure and properties of Earth materials; GEO3-1306 Chemical geodynamics; GEO3-1307 Structural geology and tectonics.
Physics of the solid Earth and planets	GEO2-1201 Linear algebra and vector analysis; GEO2-1301 Differential equations in Earth Sciences; GEO3-1312 Introduction to seismology ; GEO3-1313 Geodynamics; GEO3-1320 Programming and modelling Earth processes.

The admissions committee may decide to oblige a student to use part of the free space (free choice) in the programme for deficiency courses.

Programme structure

The table lists compulsory and recommended course modules per study path. It is compulsory to follow the Research Instruction Earth Structure and Dynamics including a course module and attendance at 10 or more scientific presentations / seminars scientific presentations/ symposia/ seminars offered by the Departments of Earth Sciences and Physical Geography, and their research groups.

MASTER OF SCIENCE IN EARTH SCIENCES, Utrecht University			
PROGRAMME	**EARTH STRUCTURE AND DYNAMICS**		
PROGRAMME-BROAD COURSES At least 1 from each bloc	**Earth Structure and Dynamics**: GEO4-1401 Structure and composition of the Earth's interior; GEO4-1411 Structural analysis of deformed rocks; GEO4-1438 Paleomagnetism		
	Research instruction Earth Structure and Dynamics: < GEO4-1424a Applied geophysics or GEO4-1430 Field research instruction geology > plus seminars and career development activities		
Recommended study path	**Physics of the solid earth and planets**	**Basins, orogens and the crust-lithosphere system**	**Earth materials**
At least 4 courses from the complete offer of the programme	GEO4-1408 Theoretical seismology	GEO4-1409 Tectonophysics	GEO4-1403 Petrological and Geochemical Evolution of the Earth
	GEO4-1409 Tectonophysics	GEO4-1416 Dynamics of the Earth's mantle	GEO4-1410 Mechanisms of deformation and transport in rocks
	GEO4-1415 Data processing and inverse theory	GEO4-1418 Dynamics of basins and orogens	GEO4-1417 Advanced mineralogy: minerals as materials
	GEO4-1416 Dynamics of the Earth's mantle	GEO4-1419 Dynamics of sedimentary systems	GEO4-1435 Advanced petrology: from microscopic properties to geological processes
	GEO4-1427 Computational geophysics	GEO4-1442 Modelling of crust and lithosphere deformation	GEO4-1443 Stable isotopes in Earth Sciences
0 to 2 courses from all programmes in the master's Earth Sciences	0 to 2 courses from all programmes in the master's Earth Sciences		
Professional profile	Geophysicist	Geophysicist / Geologist	Geologist

The Earth Science programme offers additional sets of applied courses that are organised around two main themes, namely *Geo-Resources* and *Earth and Sustainability*. These additional course modules are listed in chapter 2.6 and can be chosen in the 15 EC free course choice.

Graduation research and an internship or guided research project will largely fill the second Master year. However, the student may include additional short research projects, seminars, workshops etc. in the programme of the 2nd year. This has to be discussed with the programme leader and approved by the Board of Examiners.

Note: Students have to perform at least two individual projects during their study. The graduation research project and a guided research project or an internship. The latter two types of activities have in common that the student prepares an individual report written in English at the end.

Important regulations

- The course Field research instruction Geology (GEO4-1430) is open to students with background knowledge sufficient to give a good chance of successful completion of the course. This will be assessed on the basis of the personal study plan of the student, approved by the student's advisor. The study plan should contain an overview of previous field experience as well as details of the relevant Master course modules to be followed preceding the field course.
- See appendix 1 for guidelines starting the Master's graduation research project.

2.4 Programme Earth Surface and Water

https://students.uu.nl/en/geo/esw

Programme leader: dr. M. Straatsma (m.straatsma@uu.nl)

Earth Surface and Water is the study of physical and geochemical processes, patterns, and dynamics of Earth's continental and coastal systems. The study addresses a range of topics concerned with resource availability, morphodynamics of fluvial and coastal systems, climate and environmental reconstruction, human impact on terrestrial ecosystems, natural hazards, and hydrology. The aim is to quantitatively understand the feedback between processes and patterns on a range of temporal and spatial scales, as to understand the past, present and future evolution of Earth's environment, including human impact on this evolution. Physical geographers, geochemists and hydrologists are important as identifiers of nature's action in our modern world because of society's ever-increasing pressure on the natural environment.

The study paths within Earth Surface Water are at the forefront of scientific knowledge and development related to coastal and river sciences, hydrological and geochemical cycli, and land degradation in mountainous regions. Students work in field- and/or laboratory research, extended with the latest developments in remote sensing and computational methods. The programme covers a wide range of social problems, such as society's increased vulnerability to climate change, to natural hazards such as flooding, to storms and mass movements, as well as the adverse effects of human activity on our physical environment. The programme also considers water-related aspects, such as the climate and the environment, bioremediation and groundwater remediation. Earth Surface and Water has a strong international profile, based on its pioneering work and international expertise in the field of Environmental Modelling, Geochemistry and Geographical Information Systems (GIS), and the development and application of Geostatistics.

Study paths

Coastal dynamics and fluvial systems: The study of natural and humanly altered dynamics of the world's wave-, river-, and tide-dominated coasts and of alluvial rivers, including coastal-river interaction. The study path provides scientific understanding on how water motion, sediment transport, and morphological patterns interact, as to aid in the quantitative prediction and critical assessment of the impact of large-scale human activities in coasts and rivers. The focus can be on coasts or rivers or both.

Professional profile: Physical Geographer / specialist Morphodynamics

Environmental geochemistry: Environmental geochemistry focuses on the processes that control the functioning of natural environments at the Earth's surface. These environments are linked by the hydrological cycle, and their chemistry is strongly influenced by biological activity. They are increasingly perturbed by human activity on local, regional and global scales. In order to predict the consequences of that activity for Earth's surface environments and to maintain and improve their quality, the study path provides scientific understanding of how biology, geochemistry and hydrodynamics interact in these systems.

Professional profile: Geochemist

Geohazards and Earth observation: The study of physical processes and phenomena in and on the Earth's surface, as required for research into soil erosion, flash flooding, mass movement (slides and flows), land-use changes and land-cover deterioration. The focus is on applications of hydrology and geostatistics using spatio-temporal, GIS-based models.

Professional profile: Physical Geographer

Hydrology: The study of hydrological processes near or on the Earth's surface, such as the flow of fluids and transport of mass and energy in the subsurface. Hydrology focuses on the flow of water, nutrients and energy between the Earth's surface and the subsoil and between the Earth's surface and the atmosphere. It aims to quantify how rainfall is portioned into infiltration, evaporation and runoff, and how nutrients in the soil and the Earth's surface are distributed across the landscape through surface runoff and groundwater flow. It also aims to provide a quantitative description of various processes affecting the movement of fluids and the spread of substances and thermal energy in soil and groundwater.

Professional profile: Hydrologist

Admittance

For details regarding the admission to the programme please refer to the Teaching and Examination Regulations which can be found under 'Study Regulations' of the respective programme on students.uu.nl. Students with a Bachelor's degree or equivalent in Earth Sciences, Natural Sciences or Civil Engineering are invited to apply for the programme Earth Surface and Water. Admission to the programme is generally given to students with a Bachelor's degree who successfully complete at least two out of three (or four) the Utrecht Bachelor courses listed in the table when aiming at following the related study path. That is, the listed courses provide advisable background knowledge for the MSc courses assigned to the study path.

Coastal dynamics and fluvial systems	GEO3-4307 Fluid mechanics **or** GEO3-4303 Quaternary geology & climate change; GEO3-4305 River and Delta ecology **or** GEO3-4306 Coastal morphodynamics
Environmental geochemisty	GEO3-1308 Geochemical processes Earth's surface; GEO3-1318 Paleoceanography; GEO3-4301 Soil and water contamination.
Geohazards and Earth observation	GEO2-4208 Earth observation and data analysis; GEO3-4301 Soil and water pollution; GEO3-4304 Land degradation
Hydrology	GEO2-4203 Physical hydrology; GEO3-1330 Water in Geo-processes; GEO3-4301 Soil and water contamination; GEO3-4307 Fluid mechanics.

The admissions committee may decide to oblige a student to use part of the free space (free choice) in the programme for deficiency courses.

Programme structure

The table lists compulsory and recommended course modules per study path. It is compulsory to follow the Research Instruction Earth Surface and Water including a course module and attendance at 10 or more scientific presentations / seminars scientific presentations/ symposia/ seminars offered by the Departments of Earth Sciences and Physical Geography, and their research groups.

	MASTER OF SCIENCE IN EARTH SCIENCES, Utrecht University			
PROGRAMME	**EARTH SURFACE AND WATER**			
PROGRAMME-BROAD COURSES At least 1 from each bloc	**Earth Surface and Water**: GEO4-1434 Principles of groundwater flow; GEO4-4412 Statistics and data analysis in Physical Geography; GEO4-4433 Advanced GIS for geoscientists			
	Research Instruction Earth Surface and Water: < GEO4-1431 Field research Instruction Geochemistry or GEO4-1432 Environmental hydrogeology or GEO4-4418 Master excursion Earth Surface and Water or GEO4-4423 Climate change, hydrology and the Cryoshpere > plus seminars and career development activities			
Recommended study path	**Environmental geochemistry**	**Hydrology**	**Coastal dynamics and fluvial systems**	**Geohazards and earth observation**
At least 4 courses from the complete offer of the programme	GEO4-1421 Reactive transport	GEO4-1421 Reactive transport	GEO4-4403 Managing future deltas	GEO4-4404 Land surface hydrology
	GEO4-1433 Hydrogeological transport phenomena	GEO4-1433 Hydrogeological transport phenomena	GEO4-4409 Reconstructing Quaternary environments	GEO4-4406 Land surface process modelling
	GEO4-1439 Aquatic and environmental geochemistry	GEO4-4404 Land surface hydrology	GEO4-4434 Morphodynamics of wave-dominated coasts	GEO4-4408 Remote sensing
	GEO4-1443 Stable isotopes in Earth Sciences	GEO4-4406 Land surface process modelling	GEO4-4435 Morphodynamics of tidal systems	GEO4-4417 Unsaturated zone hydrology
	GEO4-6001 Quantitative Water Management	GEO4-4417 Unsaturated zone hydrology	GEO4-4436 River and Delta systems	GEO4-4425 Hazards and risk assessment
0 to 2 courses from all programmes in the master's Earth Sciences	0 to 2 courses from all programmes in the master's Earth Sciences			
Professional profile	Geochemist	Hydrologist	Physical geographer Specialist morphodynamics	Physical geographer Specialist geohazards / remote sensing

Graduation research and an internship or guided research project will largely fill the second Master year. However, the student may include additional short research projects, seminars, workshops etc. in the programme of the 2nd year. This has to be discussed with the programme leader and approved by the Board of Examiners.

Note: Students have to perform at least two individual projects during their study. The graduation research project and a guided research project or an internship. The latter two types of activities have in common that the student prepares an individual report written in English at the end.

Important regulations

- See appendix 1 for guidelines starting the Master's graduation research project.
- To participate in GEO4-4418 Master excursion Earth Surface and Water, students must apply before January 15th, and pay € 100,- in advance; potential participants are notified by e-mail in December.

2.5 Programme Marine Sciences

https://students.uu.nl/en/geo/marine-sciences

Programme leader: dr. Francesca Sangiorgi (F.Sangiorgi@uu.nl)

Marine Sciences is an interdisciplinary programme combining biology, chemistry, geochemistry and earth sciences of seas and oceans. Essentially all current issues in marine sciences are multidisciplinary. The programme therefore focuses on 'Marine systems and processes' as a whole, how these operate naturally and how they change through human intervention. Crucial questions include: How does global warming and changing ocean circulation impact ecosystem functioning? How do changing ecosystems affect ocean chemistry? and How does a change in ocean chemistry, in turn, impact biology?

Admittance

For details regarding the admission to the programme please refer to the Teaching and Examination Regulations which can be found under 'Study Regulations' of the respective programme on students.uu.nl. Students with a Bachelor in Natural Sciences, notably Earth Sciences, Biology, Physics and Chemistry, or a Bachelor's degree from University College Utrecht, who have obtained a BSc level understanding of seas and oceans are invited to apply for the programme Marine Sciences.You may still be eligible for admission if you have a degree other than those above. Motivated applications from all candidates will be evaluated on an individual basis.

A decision will always be made on a case-by-case basis to determine whether there are sufficient grounds for admission.

More information on admission may be also obtained from:

https://www.uu.nl/masters/en/mariene-sciences .

Programme structure

The study programme consists of four components; courses Marine Sciences (45 EC) from the MS master programme, of which 2 courses are compulsory (see table), deficiency courses/electives (0-15 EC), the MSc research (30-45 EC) and a fourth part of either a minor research project, an internship (15-30 EC) or guided research (7.5-30 EC).. The 4 courses from the MS master programme should be chosen in at least 3 of the 4 core disciplines: Physics, Earth Sciences, Chemistry and Biology. Courses and electives can be followed at Utrecht University but specific courses that are substantively complementary to those offered in Utrecht may be followed at other universities in the Netherlands or abroad.

Marine Sciences	Compulsory	GEO4-1451 Introduction to Marine Sciences GEO4-1452 Ocean Law and Policy
At least 1 course from different core disciplines	Physics	GEO4-1453 Introduction to Physical oceanography NS-MO401M* Dynamical oceanography NS-MO447M* Wave attractors NS-MO502M* Making, analyzing and interpreting observations NS-MO503M* Earth system modelling
	Earth Sciences	GEO4-1405 Paleo oceanography & climate variability GEO4-1412 Astronomical climate forcing & time scales GEO4-1419 Dynamics of sedimentary systems GEO4-1422 Reconstructing extreme climate transitions GEO4-1454 Ice-ocean-climate interactions GEO4-4434 Morphodynamics of wave-dominated coasts GEO4-4435 Morphodynamics of tidal systems
	Chemistry	GEO4-1420 Organic geochemistry GEO4-1421 Reactive transport in the hydrosphere GEO4-1431 Field research instruction Geochemistry GEO4-1439 Aquatic and environmental geochemistry GEO4-1443 Stable isotopes in Earth Sciences
	Biology	GEO4-1440 Microbes and biogeochemistry GEO4-1450 Coastal Ecology

*These courses are only recommended to students with an advanced background in Physics and who want to specialize in the field Physical Oceanography.
Courses with a code starting with "NS-M" are managed by the Department of Physics & Astronomy (at the Science Faculty).

The individual curriculum will be compiled by the student upon consultation with the programme leader.
Graduation research and an internship or guide research project will largely fill the second Master year. However, the student may include additional short research projects, seminars, workshops etc. in the programme of the 2nd year, grouped as "guided research". This has to be discussed with the programme leader and approved by the Board of Examiners.
Note: Students have to perform at least two individual projects during their study. The graduation research project and a guided research project or an internship. The latter two types of activities have in common that the student prepares an individual report written in English at the end.

Important regulations

- The course Field research instruction Geochemistry (GEO4-1431) is open to students with background knowledge sufficient to give a good chance of successful completion of the course. This will be assessed on the basis of the personal study plan of the student, approved by the student's advisor. The study plan should contain an overview of previous field experience as well as details of the relevant Master course modules to be followed preceding the field course module.
- See appendix 1 for guidelines starting the Master's research project.

2.6 Orientation towards societal, business, and policy making applications

If you wish to broaden your course-choice in an applied earth sciences direction with an orientation on research fields with societal, business and policy-making applications, several options are offered within the various programmes. Apart from the regular applied courses that are part of one or more programmes (e.g. GEO4-1500 Internship, GEO4-4403 Managing Future Deltas, GEO4-6001 Quantitative Water Management), the Earth Science programme offers additional sets of applied courses that are organised around two main themes, namely *Geo-Resources* and *Earth and Sustainability*. These additional course modules are listed in the table below and can be chosen in the 15 EC free course choice.

Geo-Resources	**Earth and Sustainability**
GEO4-1441 Reflection Seismics & Geo-resources	GEO4-2326 Tools for Energy and Materials Analysis
GEO4-1517A Applied stratigraphy and subsurface basin analysis	GEO4-2310 Environmental Change Theories
GEO4-1425 Earth mineral resources	GEO4-2312 Sustainable Energy Supply
GEO4-1437 Geothermal and unconventional Geo-resources	GEO4-2303 Environmental System Analysis
	GEO4-2324 Energy & Material Efficiency
	GEO4-2325 Current & Future GeoEnergy Resources (**NOT** allowed in combination with GEO4-1441, GEO4-1517A, GEO4-1425 and GEO4-1437)
	GEO4-2311 Policies of Energy & Materials Transitions
	GEO4-2323 Environmental Ethics and Sustainable Development
	GEO4-3510 Development Themes

The courses in the Geo-Resources theme are directed towards theoretical and practical aspects of the geology and geophysics that are essential for subsurface characterisation, monitoring, and management of geo-resources: hydrocarbons, geothermal and mineral reserves, as well as carbon capture and storage (CCS). The courses listed under the Earth and Sustainability theme aim to provide a natural-science background for a wide range of topics related to sustainability. Much attention will be devoted within these courses to policy with respect to energy, natural resources (including water) and land use, and to socio-economic aspects that are of importance for long-term changes in the transition towards a sustainable Earth. It is also possible to choose courses that are not part of the Earth Sciences curriculum in Utrecht (for example Geo-resources related courses that are offered at the Vrije Universiteit Amsterdam). You can bring this forward and discuss this with the programme leader. In all cases, you need approval of the Board of Examiners for your personal programme. It is strongly recommended to complete your applied-oriented course choice with an internship in a non-academic organisation or company.

2.7 Orientation towards Communication

The Earth Science master programmes provide the opportunity to develop communicative and informal educative skills for making scientific knowledge accessible to the broad public. If you are interested in a career in science communication, for instance as a scientific journalist or a museum educator, you might be interested in taking a Communication course package offered by the Freudenthal Institute.

The total workload of this course package is 30 EC. The course package is registered as three courses and consists of two mandatory courses:

- FI-MSECIPD Internship Product Development (Mandatory 20 EC)
- FI-MSECCSP Communicating Science with the Public (Mandatory 5 EC)

plus an elective of 5 EC out of the following courses:

- FI-MSECITS Issues and Theories in Science Education (5 EC) (semester 1)
- FI-MSECDSE Designing science education for formal and informal settings (5 EC) (semester 2)
- FI-MSECSIS Science in Society (5 EC) (period 4)

You can use the 15 EC elective courses of your own master programme to take the above course package. The other 15 EC is taken instead of an equivalent amount of EC in your individual programme (internship or guided research). **Please note that:**

- The above exception from the regular exam requirements to replace 15 EC elective courses by the Communication course package only applies if you take and pass the full 30 EC Communication course package.
- The other regular exam requirements remain to apply to complete the master programme, including the rules regarding the 45 EC programme-related course modules, the MSc Research project, and the second individual project (internship (GEO4-1500) or guided research (GEO4-1521)). With respect to the latter, it is highly recommended to do a 15 EC Internship with a C/E focus according to Earth Sciences procedures and guidelines.
- The FI-MSECIPD or any other course module from the above Communication course package cannot count as an Earth Sciences individual project (GEO4-1500 or GEO4-1521).

This means that your study programme contains the following elements:

2 Programme-broad courses (see previous sections for further programme-related requirements for the possible course choice)	15 EC
4 Programme-related theoretical courses (see previous sections for further programme-related requirements for the possible course choice)	30 EC
Communication course package	30 EC
MSc Research (GEO4-1520)	30 EC
Second individual project (GEO4-1500 Internship (recommended) or GEO4-1521 Guided research)	15 EC

For further information about the Communication course package provided by the Freudenthal Institute, please contact Liesbeth de Bakker (Email: e.p.h.m.debakker@uu.nl).

2.8 Year schedule and timetable

	1	2	3	4	5	6	7	8	9	10	11	12
	2021-2022											
	36	37	38	39	40	41	42	43	44	45		
	Geen MA; wel BA onwijs	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	tentamen eindtoets		
	MSc intro					Ardennen vr wk-40 t/m zon wk-41						

NB: Week 1, periode 1, geen MSc onderwijs plannen. Vrijdag wk 40 t/m zondag wk 41 reserveren voor de Ardennen exc.(jr 1). Overig BA en MA onderwijs gaat 'gewoon' door.

	46	47	48	49	50	51	52	1	2	3	4	5
	1	**2**	**3**	**4**	**5**	**6**	Kerst break	Kerst break	**7**	**8**	tentamen eindtoets	onderwijs vrij
		BSc open dagen			**AGU**				reparatie	reparatie		

	6	7	8	9	10	11	12	13	14	15	16	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	tentamen eindtoets	onderwijs vrij	
					reparatie periode 2			**EGU**				

	17	18	19	20	21	22	23	24	25	26	27	28
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	tentamen eindtoets	reparatie P3 jr 1+2
						tent. /eind.						evt. P3.jr.3 reparatie

reparatie = aanvullende- of vervangende toets

P = periode

wk 52, 1, 5 en 16 zijn academische vakanties

Goede Vrijdag:	week 15	vrijdag	15-04-22
Pasen:	week 16	maandag	18-04-22
Koningsdag:	week 17	woensdag	27-04-22
Bevrijdingsdag:	week 18	donderdag	05-05-22
Hemelvaart:	week 21	donderdag	26-05-22
Pinksteren:	week 23	maandag	05-06-22

AGU	13-17 dec. 2021 - New Or
NAC	voorjaar 2022
EGU	3-8 apr. 2022 - Vienna

BSc open dagen 26+27 nov.2021

M1 ELC / ESD / ESW

A GEO4-1401 7,5 Structure & composition ot Earth interior m Deuss	A GEO4-1408 7,5 Theoretical seismology m Deuss	A GEO4-1438 7,5 Paleomagnetism m Krijgsman	A GEO4-1424A 7,5 Applied geophysics m Pires de Vasconcelos
B GEO4-1415 7,5 Dataprocessing and inverse theory m Trampert	B GEO4-1409 7,5 Tectonophysics m Govers	D GEO4-1410 7,5 Mechanisms of deformtion & transport in rocks m Niemeijer	D GEO4-1427 7,5 Computational Geophysics m Thieulot
A GEO4-1435 7,5 Adv. Petrology: from microscopic propertie m Plümper	D GEO4-1412 7,5 Astronomical climate forcing & time scales m Hilgen	B GEO4-1416 7,5 Dynamics of the Earth's mantle m Spakman ea.	f 7,5 GEO4-1437 Geothermal and unconventional GEO-Resources m Beekman
B GEO4-1405 7,5 Paleo oceanography & climate variability m Reichart	C GEO4-1411 7,5 Structural analysis of deformed rocks m De Bresser	B GEO4-1422 7,5 Reconstructing extreme climate transitions m Van de Schootbrugge	f 7,5 GEO4-1430 Field research instruction geology m De Bresser
C GEO4-1403 7,5 Petrological and Geochemical Evolution of the Earth m Mason	A GEO4-1418 7,5 Dynamics of basins and orogens m Matenco	A GEO4-1417 7,5 Adv. Mineralogy: minerals as materials m Plümper	f 7,5 GEO4-1420 Organic geochemistry m Peterse
C GEO4-1439 7,5 Aquatic and environmental geochem. m Wolthers	D GEO4-1433 7,5 Hydrogeological transport phenomena m Zech	D GEO4-1419 7,5 Dynamics of sedimentary systems m Eggenhuisen	f 7,5 GEO4-1431 Field research instruction geochemistry m Behrends
D GEO4-1434 7,5 Principles of groundw ater flow m Schotting	B GEO4-1443 7,5 Stable isotopes in Earth Sciences m Polerecky	D GEO4-1421 7,5 Reactive transport in the hydrosphere m Polerecky	f 7,5 GEO4-1432 Environmental Hydrogeology m Raoof
A GEO4-1440 7,5 Microbes and Biogeochemistry m Middelburg	C GEO4-1517A 7,5 Applied stratigraphy and subsurface basin analysi m Trabucho Alexandre	B GEO4-1425 7,5 Earth mineral resources m Beekman	f 7,5 GEO4-1454 Ice-ocean-climate interactions new 2021-2022 m Bijl ea.
D GEO4-1441 7,5 Reflection Seismics and Geo-resources m Matenco	C GEO4-1514B 7,5 Vertebrate evolution (tetrapods) m Wessels		
D GEO4-1442 7,5 Modell. of crust and lithospheric deform. m Van Dinther			

M2 ELC ESD ESW

f GEO4-1520 30-45 MSc research/thesis m	f GEO4-1521 15-30 MSc individual programme / guided research etc. m

M1 ELC ESD ESW	B	GEO4-4404	7,5	D	GEO4-4408	7,5	B	GEO4-4403	7,5	f	7,5
		Land surface hydrology			Remote Sensing			Coastal zone and river management			GEO4-4418
	m	Van Beek		m	De Jong		m	Nienhuis			MSc excursion ESW
	C	GEO4-4412	7,5	C	GEO4-4417	7,5	A	GEO4-4406	7,5		
		Statistics and data anal. Phys.Geogr.			Unsaturated zone hydrology			Land surface process modelling		m	Giesecke ea
	m	Sterk		m	Bierkens		m	Karssenberg			
	D	GEO4-4433	7,5	A	GEO4-4435	7,5	C	GEO4-4409	8		
		Advanced GIS for geoscientists			Morphodynamics of tidal systems			Reconstructing Quarternary environments			
	m	Zeijlmans van Emmichoven		m	Van der Vegt		m	Hoek			
	A	GEO4-4436	7,5	A	GEO4-6001	7,5	D	GEO4-4425	8		
		River and Delta Systems			Quantitative w ater management			Hazard risk assessment			
	m	Kleinhans		m	Wanders		m	De Jong			
							A	GEO4-4434	7,5		
								Morphodynamics of w ave-dominated coasts			
							m	Ruessink			

M2	f	GEO4-1520	30-45	f	GEO4-1521	15-30
		MSc Research / Thesis			MSc individual programme / guided research	
	m			m		

	f	7,5	f	7,5		
		GEO4-4423				
		Climate change, hydrology and the cryosphere				
	m	Immerzeel				

compulsory courses	D	GEO4-1451	7,5					C	GEO4-1452	7,5					
	Introduction to Marine Sciences							Ocean Law and Policy							
	m	Sangiorgi						m	Nguyen / Trevisanut (REBO)						
physics	C	NS-MO502M	7,5	C	GEO4-1453	7,5		D	NS-MO401M	7,5	A	NS-MO503M	7,5		
	Making, analyzing and interpreting observa			Introduction to Physical Oceanography				Dynamical Oceanography			Earth system modelling				
	m	Popa		m	…. (NS)			m	Van Sebille (NS)		m	Baatsen / Wieners (NS)			
								B	NS-MO447M (uitsluitend dinsdagochtend)	7,5					
								Wave attractors							
								m	Maas (NS)						
Earth Sciences	B	GEO4-1405	7,5	D	GEO4-1412	7,5		D	GEO4-1419	7,5				f	7,5
	Paleo oceanography & climate variability			Astronomical climate forcing & time scales				Dynamics of sedimentary systems						GEO4-1454	
	m	Reichart		m	Hilgen			m	Eggenhuisen					Ice-ocean-climate interactions	
				A	GEO4-4435	7,5		A	GEO4-4434	7,5				new 2021-2022	
				Morphodynamics of tidal system				Morphodynamics of w ave-dominated coasts						m	Bijl ea.
				m	Van der Vegt			m	Ruessink						
								B	GEO4-1422	7,5					
								Reconstructing extreme climate transitions							
								m	Van de Schootburgge						
Chemistry	C	GEO4-1439	7,5	B	GEO4-1443	7,5		D	GEO4-1421	7,5	f		7,5	f	7,5
	Aquatic and environmental geochem.			Stable isotopes in Earth Sciences				Reactive transport in the hydrosphere			GEO4-1420			GEO4-1431	
	m	Wolthers		m	Polerecky			m	Polerecky		Organic geochemistry			Field research instruction geochemistry	
											m	Peterse		m	Behrends
Biology	A	GEO4-1440	7,5	D	GEO4-1450	7,5									
	Microbes and Biogeochemistry			Coastal Ecology											
	m	Middelburg		m	Reijers										
M2 MRS	f	GEO4-1520	30-45	f	GEO4-1521	15-30									
	MSc Research / Thesis			MSc individual programme / guided research / traineeship											
	m			m											

NOTES:

Part 3

Courses

3.1 List of course modules

Course	Name	EC	period	timeslot
GEO4-1401	AW-Structure and composition of the Earth's interior	7.5	1	A
GEO4-1403	AW-Petrological and Geochemical Evolution of the Earth	7.5	1	C
GEO4-1405	AW-Paleoceanography and climate variability	7.5	1	B
GEO4-1408	AW-Theoretical seismology	7.5	2	A
GEO4-1409	AW-Tectonophysics	7.5	2	B
GEO4-1410	AW-Mechanisms of deformation & transport	7.5	3	D
GEO4-1411	AW-Structural analysis of deformed rocks	7.5	2	C
GEO4-1412	AW-Astronomical climate forcing and time scales	7.5	2	D
GEO4-1415	AW-Dataprocessing and inverse theory	7.5	1	B
GEO4-1416	AW-Dynamics of the Earth's mantle	7.5	3	B
GEO4-1417	AW-Advanced mineralogy: minerals as materials	7.5	3	A
GEO4-1418	AW-Dynamics of basins and orogens	7.5	2	A
GEO4-1419	AW-Dynamics of sedimentary systems	7.5	3	D
GEO4-1420	AW-Organic geochemistry	7.5	4.1	full
GEO4-1421	AW-Reactive transport in the hydrosphere	7.5	3	D
GEO4-1422	AW-Reconstructing extreme climate transitions	7.5	3	B
GEO4-1424a	AW-Applied geophysics	7.5	4	A
GEO4-1425	AW-Earth mineral resources	7.5	3	B
GEO4-1427	AW-Computational geophysics	7.5	4	D
GEO4-1430	AW-Field research instruction geology	7.5	4.2	full
GEO4-1431	AW-Field research instruction geochemistry	7.5	4.2	full
GEO4-1432	AW-Environmental hydrogeology	7.5	4.1	full
GEO4-1433	AW-Hydrogeological transport phenomena	7.5	2	D
GEO4-1434	AW-Principles of groundwater flow	7.5	1	D
GEO4-1435	AW-Adv.petrology: from microscopic prop. to geological processes	7.5	1	A
GEO4-1437	AW-Geothermal und unconventional Geo-Resources	7,5	4.1	full
GEO4-1438	AW-Paleomagnetism	7.5	3	A
GEO4-1439	AW-Aquatic and environmental geochemistry	7.5	1	C
GEO4-1440	AW-Microbes and biogeochemistry	7.5	1	A
GEO4-1441	AW-Reflection seismics and Geo-resources	7.5	1	D
GEO4-1442	AW-Modelling of crust and lithosphere deformation	7.5	1	D
GEO4-1443	AW-Stable isotopes in Earth Sciences	7.5	2	B
GEO4-1450	AW-Coastal ecology	7.5	2	D
GEO4-1451	AW-Introduction to marine sciences	7.5	1	D
GEO4-1452	AW-Ocean law and policy	7.5	3	C
GEO4-1453	AW-Introduction to physical oceanography	7.5	2	C
GEO4-1454	AW-Ice-Ocean-Climate interactions	7.5	4.b	full

GEO4-1514B	AW-Vertebrate evolution (tetrapods)	7.5	2	C
GEO4-1517A	AW-Applied stratigraphy and subsurface basin analysis	7.5	2	C
GEO4-1520	AW-Graduation research, Earth sciences	30-45	year	n.a.
GEO4-1521	AW-Guided research	7,5-30	year	n.a.
GEO4-1523	AW-Advanced course	7,5	year	n.a.
GEO4-1524	AW-Advanced course	7,5	Year	n.a.
GEO4-1500	AW-Internship	15-30	year	n.a.
GEO4-2325	SUSD-Fossil resources (**NOT** for Earth Sciences students)	7.5	3	C
GEO4-4403	AW-Managing future deltas	7.5	3	B
GEO4-4404	AW-Land surface hydrology	7.5	1	B
GEO4-4406	AW-Land surface process modelling	7.5	3	A
GEO4-4408	AW-Remote Sensing	7.5	2	D
GEO4-4409	AW-Reconstructing quaternary environments	7.5	3	C
GEO4-4412	AW-Statistics and data analysis in Physical geography	7.5	1	C
GEO4-4416	AW-MSc Individual programme / internship	15-30	year	n.a.
GEO4-4417	AW-Unsaturated zone hydrology	7.5	2	C
GEO4-4418	AW-MSc excursion Earth Surface and Water	7.5	4.1	n.a.
GEO4-4423	AW-Climate change, hydrology and the Cryoshpere	7.5	4.2	full
GEO4-4425	AW-Hazard risk assessment	7.5	3	D
GEO4-4433	AW-Advanced GIS for Geoscientists	7.5	1	D
GEO4-4434	AW-Morphodynamics of wave-dominated coasts	7.5	3	A
GEO4-4435	AW-Morphodynamics of tidal systems	7.5	2	A
GEO4-4436	AW-River and Delta systems	7.5	1	A
GEO4-4437	AW-Advanced course	7.5	year	n.a.
GEO4-4438	AW-Advanced course	7.5	year	n.a.

n.a.: not applicable

NOTES:

Part 4

Appendix

APPENDIX 1

Master's programmes Earth Sciences

MSc research (GEO4-1520)

Objective

The MSc Research represents the culmination of the Earth Sciences Master's programmes. When conducting MSc research, the student demonstrates skills to pursue independent research and shows advanced knowledge in the field of the MSc programmes. The student demonstrates the capability to apply and to integrate advanced knowledge in order to interpret scientific results and to answer research questions. Performing MSc research includes a critical study of the relevant scientific literature, and application of the gathered information to accomplish the research objectives. The MSc research is mandatory for all students and encompasses a credit load of at least 30 ECTS and a maximum of 45 ECTS. The allocated number of ECTS credits should be a multiple of 7.5 (e.g. 30, 37.5, or 45 ECTS credits). The difference in duration should reflect the difference in working time required for establishing the data base for the project and not be associated with different profundity. This implies that the same assessment criteria apply for MSc theses irrespective of duration. The MSc research encompasses a written report (MSc thesis) and an oral presentation, both obligatory in English, which complete the independent research assignment of the Earth Sciences Master's programmes. The thesis should – in principle – contain material of publishable quality.

Table 1 provides a comparison between MSc Research, Guided Research and Internship.

Pre-requisites

The pre-requisites follow the rules and regulations of the Master's programme Earth Sciences and guarantee a competent starting level for the student on the aspects of research capabilities and general and specialist knowledge.

To start with MSc research a student has to obtain at least 30 ECTS credits of theoretical first year MSc courses (GEO4-…) from the relevant programme. Note that the total of 30 ECTS credits mentioned above is only the minimum requirement for starting the MSc research. At least 45 ECTS credits from theoretical courses are required for receiving the MSc degree. Usually, the student has completed more theoretical courses within his/her personal programme, established earlier in consultation with the programme leader and after authorization by the Board of Examiners.

Tab. 1 Comparison MSc Research, Guided Research and Internship

	MSc Research GEO4-1520	*Guided Research GEO4-1521*	*Internship GEO4-1500*
Compulsory	Yes, for all programmes and profiles	Performing at least one (all programmes)	
Possible number of ECTS credits	30, 37.5, 45	7.5, 15, 22.5, 30	15 – 30
Type of host institution	Academic (exceptional non-academic)	Academic (exceptional non-academic)	Non-academic
Possibility to be performed at external institution	Yes	Yes	Exclusively at external institution
Compulsory report, individually written in English	Yes	Yes	Yes
Oral presentation	Compulsory	Possible (not part of evaluation)	Possible (not part of evaluation)

Procedure and content

There are different ways to find an MSc project. MSc projects supervised by staff from the Department of Physical Geography are published in February. Students can apply for these projects following the instructions on the document. For projects at the Department of Earth Sciences, students are encouraged to take the initiative in talking to the academic staff members about possible research topics.

The MSc thesis is an individual product that is accomplished by a single student under supervision of a staff member. MSc Research projects can be done in collaboration with other students, but only under the condition that each student works on the basis of an individual problem statement and that the individual performance (and individual thesis) of each student can be properly judged by the supervisor. Together with a thesis supervisor, the student selects a suitable topic of interest that fits within, or has strong links with, one of the Earth Sciences programmes. The topic could be theoretical or practical, could include fieldwork and/or lab-work and/or computer-based simulation/modelling. The Graduate School of Geosciences does not provide any financial compensation for the research components: costs (e.g. fieldwork or laboratory analyses) are in principle for the committed research group.

For all MSc thesis projects, a permanent member of the scientific staff of the department of Earth Sciences or Physical Geography is responsible for the supervision and research assessment. Postdocs and PhD-students may be involved in the daily supervision and can act as second supervisors. It is possible that the thesis project is performed at another academic or non-academic institution. In this case, a staff member at the host institution will be in charge of the daily supervision who is typically then also the second supervisor. If the project does not involve a second supervisor, a second reviewer has to be assigned to the project. Typically, the second reviewer is only involved in the assessment of the MSc research. However, the second reviewer takes over the responsibilities of the first supervisor if necessary.

Before starting an MSc project, the planning has to be approved by the Board of Examiners. The MSc proposal has to contain:

- **Personal data of the MSc student** (name, student number, e-mail, telephone number)
- **Title of the project**
- **Name of the first supervisor**, who is part-time or fulltime permanent staff member of the department of Earth Sciences or Physical Geography.
- **The name of a second supervisor** (if involved in conducting the project) or a second reviewer (if only involved in the assessment of the project). If the project involves a 2nd supervisor from another faculty at Utrecht University the relative contribution of the 2nd supervisor (in %) has to be indicated in the proposal.
- **Number of ECTS credits**
- **Research plan**
  The research plan should include a research objective, research questions, and the methodology. The plan should not exceed 1000 words.
- **Time planning of the MSc project**
  Start and finish date are indicated in the time planning.
  The time planning has to be consistent with the number of ECTS; 1 week with 40 working hours corresponds to 1.43 ECTS. The length of the project has to be planned in a way that public holidays are excluded in the calculation of the total number of working hours.
  The time planning has to include meetings with the supervisor(s) and should indicate if the supervisor is not accessible for longer time periods.
  Milestones are defined in the time planning, which can be used to evaluate the progress of the MSc project e.g. accomplishment of the required data set, handing in of the first draft version of the MSc thesis, etc.
- **No-go criteria**, which define the minimum progress a student has to achieve within about 1/3 of the duration of the thesis. After this period, a meeting with the supervisor is scheduled and the progress of the student is evaluated in view of its no-go criteria. If the student fails to meet these criteria, the supervisor can decide that the MSc project is discontinued, implying that the student has to start a new MSc project.

In case that the MSc project involves fieldwork, the proposal also includes the signed ***Declaration regarding safety and behavior during excursions and fieldwork***. The form and the related safety regulations and guidelines can be requested from the teaching institute. Note that assessing the risks of the planned MSc fieldwork and discussing these risks with the student is the task of the supervisor and part of the safety procedure.
Because of insurance purposes and to get a quick overview of the students abroad in emergency situations, it is required and obliged to register your stay abroad in the framework of your studies in Osiris.

The proposal has to be signed by the student and the first supervisor. The signed proposal has to be sent to the Board of Examiners. A general form of the proposal can be found at the end of the guideline.

During the MSc project, it is expected that the student does all in his/her power to fulfill the commitments agreed on in the MSc proposal and to ensure the progress of the project as planned. A delay in finalizing the MSc project of more than four weeks after the intended ending date has to be reported and justified by the student to the Board of Examiners. A request of postponing the date of completion has to be supported by the supervisor and has to include an updated time planning. The request has to be approved by the Board of Examiners. The Board of Examiners can disapprove the request if the delay is solely caused by the student himself. The Board of Examiners has to be informed at least at the date of completion as indicated in the time planning. **Delayed completion of the MSc thesis without approval by the Board of Examiners can lead to its rejection**.
At the end of the MSc project, the student presents his/her results in a public oral presentation, which contributes to the final grade of the MSc thesis project. After your thesis has been approved, it has to be

uploaded into the thesis archive. Within one month after the grade is registered in OSIRIS, the student will receive a request by email to upload the reviewed thesis (in PDF format) through OSIRIS Case for the purpose of the thesis archive. The thesis archive is only accessible to employees.
In the same OSIRIS Case, you can decide to get your thesis published on the "Worldcat/Google" platform of the Utrecht University Library. It is possible to upload a specific version of your thesis that meets the requirements for public publication. Other students and staff can thus benefit from your research work.

After sufficient feedback and discussion, the supervisor grades the MSc thesis project. The final assessment must include the approval of a second person. This person is either a second supervisor involved in the project or a member of the permanent staff of the Graduate School of Geosciences. The evaluation of the thesis will be based on the MSc Thesis Rubric Earth Sciences. The Rubric can be found on SURFdrive of can be requested from the teaching institute. The Rubric includes instructions how the grade of the MSc thesis project is determined.
The Rubric, which also functions as an evaluation form, has to be signed by the student, the supervisor, and a 2nd reviewer/supervisor and sent to Student Affair Geosciences together with the statement of originality for final approval. The signed Rubric has to be sent to the Student Affairs Geosciences via studadm.geo@uu.nl by the supervisor.

A final mark of 8.5 or higher will only be approved by the Board of Examiners if it is supported by a third reviewer. This third reviewer a)should be an expert in the field of research covered by the thesis; b) should not have been involved in any way in the graduation project and/or writing stage; c) may be a university lecturer from outside Utrecht University; d) is expected to provide a short written statement. In this statement the 3rd reviewer declares that the written argumentation in the evaluation form justifies the exceptional high mark of ≥ 8.5, and illustrates that the thesis belongs to the top 15% of the Earth Sciences MSc theses at Utrecht University. It is the task of the main supervisor to request for this statement and to add this to the standard thesis assessment form.

MSc thesis assessment form plus support sheet can be found on Blackboard (https://uu.blackboard.com) or at SURFdrive.

Proposal Master Research GEO4-1520

Name:
Student number:
e-mail:
telephone (optional):
Name 1st supervisor (UU):
Name 2nd supervisor:
Credits:

Title:

Research Plan (max. 1000 words or two pages A4-format)
Introduction:

Objectives and Research Questions:

Methods:

Stay abroad:

Schedule:

Date / Period	Activity / Milestone
	Go or No Go - talk

No-go criteria:

Signatures:

Name student Name 1st Supervisor (UU) Name 2nd Supervisor

Statement of originality of the MSc thesis

I declare that:

1. this is an original report, which is entirely my own work,

2. where I have made use of the ideas of other writers, I have acknowledged the source in all instances,

3. where I have used any diagram or visuals I have acknowledged the source in all instances,

4. this report has not and will not be submitted elsewhere for academic assessment in any other academic course.

Student data:

Name:

Registration number:

Date:

Signature:

Hand in this statement of originality to Board of Examiners by es.theses@uu.nl .

UNIVERSITEIT UTRECHT

GRADUATE SCHOOL OF GEOSCIENCES
EARTH SCIENCES
MASTER'S THESIS RUBRIC |*Instructions*

The master's thesis rubric consists of two parts: the **Rubric** (Word file) and the **Rubric Support Sheet** (Excel file). The Rubric will also be handed over to the students. The Rubric Support Sheet is only meant as an aid for supervisors in determining the final grade and should not be presented to the student.

Mind you! Both files are secured and only designated cells can be filled in.

The Rubric has to be signed by the student, the first reviewer (usually the first supervisor), and a 2nd reviewer. It then has to be send to Student Affairs Geosciences via studadm.geo@uu.nl , together with the statement of originality for final approval. For the rules regarding the involvement of a third reviewer in case of a grade ≥8.5, please see the separate document "Guidelines MSc thesis Earth Sciences".

Rubric

- For each criterion, indicate the most appropriate description with an **x** in one of the boxes.
- **Please fill in only one box in every row.**
- If you assess the quality of a criterion as unacceptably low, please use your own words to substantiate this lack of quality in the left-hand column '*Unacceptable < 4.0*'.
- The consequence of one score 'Unacceptable' in the final assessment is a FAIL for the thesis project, no repair possible.
- The score 'Insufficient' in one or more criteria can be compensated by a higher score in other criteria.
- In case of a final grade below 5.5 but higher than 4.0, the quality of the thesis is insufficient, but one chance to repair will be offered. The supervisor determines how the insufficient performance has to be emended. The amendment has to be done within 4 weeks after the evaluation. When the amendment is sufficient, the final grade of the thesis will be 6.0.

Rubric Support Sheet

- On the basis of the boxes ticked in the Rubric and your relative weighting of the various criteria, the Rubric Support Sheet provides a range in which the final grade should fall.
- The criteria of the Rubric match the criteria in the Excel sheet.
- Only fill in one cell per row; *the sheet gives a warning in case more than one cell is filled in.*
- The main categories Thesis – Process – Presentation have fixed relative weights.
- The weighting of each criterion can be adjusted in the range 1 – 1.5 – 2 – 2.5, according to your own judgment; *the sheet takes these weights into account in calculating the grades.*
- The grading per criterion results into values Low-Mean-High. In the Option column on the right, you can fill in a grade per criterion, deciding yourself whether you prefer the Low, Mean or High value, or even a value in between.

MSc thesis assessmentform plus support sheet can be found on Blackboard (https://uu.blackboard.com) or at SURFdrive.

APPENDIX 2

Master's programmes Earth Sciences

Guided research (GEO4-1521)

Objective

In addition to the Graduation Research, all Earth Sciences MSc students have to perform a second individual project. This second project can be in the form of a Guided Research or an Internship. A Guided research project can be performed externally at another academic or non-academic institution. A Guided Research is similar to a Graduation Research (MSc project) but, in comparison to the Graduation Research, the expectations regarding the autonomy and independence of the student in a Guided Research project are lower. This applies particularly to developing the research objectives and methodology. Furthermore, an oral presentation of the results is not obligatory and not part of the assessment.

Summerschools, seminars, or other courses are part of the category Advanced Courses and are not conceived as Guided Research. Table 1 provides a comparison between MSc Research, Guided Research and Internship.

Tab. 1 Comparison MSc Research, Guided Research and Internship

	MSc Research GEO4-1520	*Guided Research GEO4-1521*	*Internship GEO4-1500*
Compulsory	Yes, for all programmes and profiles	Performing at least one (all programmes)	
Possible number of ECTS credits	30, 37.5, 45	7.5, 15, 22.5, 30	15 – 30
Type of host institution	Academic (exceptional non-academic)	Academic (exceptional non-academic)	Non-academic
Possibility to be performed at external institution	Yes	Yes	Exclusively at external institution
Compulsory report, individually written in English	Yes	Yes	Yes
Oral presentation	Compulsory	Possible (not part of evaluation)	Possible (not part of evaluation)

Pre-requisites

To start with a Guided Research a student has to obtain at least 30 ECTS of theoretical MSc courses (GEO4-…) from the relevant programme. A guided research can be performed before or after the Graduation Research.

Procedure and content

The topic of the Guided Research has to fit within, or has strong links with, one of the Earth Sciences programmes. The methodology can be based on literature studies but can also include practical activities such as: fieldwork, lab-work or computer-based simulation/modelling. In any case, a permanent member of the scientific staff of the department of Earth Sciences or Physical Geography is responsible for the supervision and research assessment. Postdocs and PhD-students may be involved in the daily supervision and can act as second supervisors. It is possible that the Guided Research project is performed at another academic or non-academic institution. In this case, a staff member at the host institution will be in charge of the daily supervision who is typically then also the second supervisor. If the project does not involve a second supervisor, a second reviewer has to be assigned to the project. Typically, the second reviewer is only involved in the assessment of the report. However, the second reviewer takes over the responsibilities of the first supervisor if necessary.

As part of the project prepares an individual report written in **English**. This report is a stand-alone document and it is inadmissible that it text overlaps with any other report/thesis, including those produced by the student himself/herself.

The credit load of a Guided Research can vary between 7.5 and 30 ECTS credits in steps of 7.5 ECTS credits.

Before starting a Guided Research project, the planning has to be approved by the Board of Examiners. The proposal has to contain:

- **Personal data of the MSc student** (name, student number, e-mail, telephone number)
- **Title of the project**
- **Name of the first supervisor**, who is part-time or fulltime permanent staff member of the department of Earth Sciences or Physical Geography.
- **The name of a second reviewer** who is another staff member of the department of Earth Sciences or Physical Geography or the daily supervisor at the host institution.
- **Host institution and contact person** if applicable.
- **Number of ECTS**
- **Project description**
  The project description should include the Earth Science related background of the project, the (research) objectives, and the methodology. The plan should not exceed 1000 words.
- **Time planning of the project**
  Start and finish date are indicated in the time planning.
  The time planning has to be consistent with the number of ECTS; 1 week with 40 working hours corresponds to 1.43 ECTS. The length of the project has to be planned in a way that public holidays are excluded in the calculation of the total number of working hours.

In case that the Guided Research project involves fieldwork, the proposal also includes the signed ***Declaration regarding safety and behavior during excursions and fieldwork***. The form and the related safety regulations and guidelines can be requested from the teaching institute. Note that assessing the risks of the planned MSc fieldwork and discussing these risks with the student is the task of the supervisor and part of the safety procedure.
Because of insurance purposes and to get a quick overview of the students abroad in emergency situations, it is required and obliged to register your stay abroad in the framework of your studies in Osiris.

The proposal has to be signed by the student, the first supervisor and preferably the second reviewer. The signed proposal has to be sent to the Board of Examiners. A general form of the proposal can be found at the end of the guideline.

During the project, it is expected that the student does all in his/her power to fulfill the commitments agreed on in the Guided Research proposal and to ensure that the progress of the project is as planned. A delay in finalizing the project of more than four weeks after the intended ending date has to be reported and justified by the student to the Board of Examiners. A request of postponing the date of completion has to be supported by the supervisor and has to include an updated time planning. The request has to be approved by the Board of Examiners. The Board of Examiners can disapprove the request if the delay is solely caused by the student. The Board of Examiners has to be informed at least at the date of completion as indicated in the time planning. **Delayed completion of the project without approval by the Board of Examiners can lead to its rejection**.

At the end of the Guided Research project, the supervisor and the second reviewer grade the project. The evaluation of the project will be based on the Guided Research Rubric Earth Sciences. The Rubric can be found on SURFdrive of can be requested from the teaching institute. The Rubric includes instructions on how the grade of the project is determined.

The Rubric should be discussed with the student and has to be signed by the supervisor and the second reviewer. The signed Rubric has to be sent to Student Affairs Geosciences via studadm.geo@uu.nl by the supervisor. An electronic copy of the final report has to be sent to the Board of Examiners via es.theses@uu.nl .

A final mark of 8.5 or higher will only be approved by the Board of Examiners if it is supported by a third reviewer. This third reviewer a)should be an expert in the field of the internship / guided research; b) should not have been involved in any way in the project and/or writing stage; c) may be a university lecturer or professional from outside Utrecht University; d) is expected to provide a short written statement. In this statement the 3rd reviewer declares that the written argumentation in the evaluation form justifies the exceptional high mark of ≥ 8.5, and illustrates that the thesis belongs to the top 15% of the Earth Sciences MSc theses at Utrecht University. It is the task of the main supervisor to request for this statement and to add this to the standard thesis assessment form.

Guided research assessmentform plus support sheet can be found on Blackboard (https://uu.blackboard.com) or at SURFdrive.

Proposal Guided Research (GEO4-1521)

Name:
Student number:
e-mail:
telephone (optional):
1st supervisor:
2nd supervisor /reviewer :
If applicable: Host institution and contact person

ECTS Credits:

Title:

Project description
Introduction

Objectives

Methods

Abroad

Schedule

Date / Period	Activity
	First version of report submitted
	Final version of report submitted

Signatures

Student 1st Supervisor 2nd supervisor /reviewer

Statement of originality of Guided research report

I declare that:

1. this is an original report, which is entirely my own work,

2. where I have made use of the ideas of other writers, I have acknowledged the source in all instances,

3. where I have used any diagram or visuals I have acknowledged the source in all instances,

4. this report has not and will not be submitted elsewhere for academic assessment in any other academic course.

Student data:

Name:

Registration number:

Date:

Signature:

Hand in this statement of originality to Board of Examiners by es.theses@uu.nl

APPENDIX 3

Master's programmes Earth Sciences

Internship (GEO4-1500)

Objective

In addition to the MSc Research, all Earth Sciences MSc students have to perform a second individual project. This second project can be in the form of a Guided Research or an Internship. The objectives of the Internship should be based on the application of Earth Sciences based expertise to technical, economical or societal questions. Furthermore, an Internship is usually performed at an institution or company outside UU, typically from the non-academic sctor. In an Internship, the focus lies on a) analyzing a technical, economical or societal problem regarding its earth scientific aspects; b) develop and apply earth scientific methods and expertise to tackle this problem c) document the results in a report and transfer the knowledge to the host institution. Note: If you are thinking about performing your MSc Research project at a non-academic institution, this is not the place to find information: MSc research projects are handled as MSc Research, not as an Internship. Table 1 provides a comparison between MSc Research, Guided Research and Internship.

Tab. 1 Comparison MSc Research, Guided Research and Internship

	MSc Research GEO4-1520	*Guided Research GEO4-1521*	*Internship GEO4-1500*
Compulsory	Yes, for all programmes and profiles	Performing at least one (all programmes)	
Possible number of ECTS credits	30, 37.5, 45	7.5, 15, 22.5, 30	15 – 30
Type of host institution	Academic (exceptional non-academic)	Academic (exceptional non-academic)	Non-academic
Possibility to be performed at external institution	Yes	Yes	Exclusively at external institution
Compulsory report, individually written in English	Yes	Yes	Yes
Oral presentation	Compulsory	Possible (not part of evaluation)	Possible (not part of evaluation)

Pre-requisites

To start with a traineeship a student has to obtain at least 30 ECTS credits of theoretical MSc courses (GEO4-...) from the relevant programme. An Internship can be performed before or after the Graduation Research.

Procedure and content
It is important that the internship is of sufficient academic level. That is, that you are assigned a task for which you will need the knowledge and capabilities that you have acquired in the past years. An Internship that merely consists of a looking over one's shoulder ("meeloopstage") is not suitable. Please also visit the MSc Earth Sciences Internship community on Blackboard. There you can find extra information related to Internships.

As part of the Internship, the student prepares an **individual** report written in English. An internship can be done in collaboration with other students, but only under the condition that each student works on the basis of an individual problem statement and that the individual performance of each student can be properly judged by the supervisor. Each student has to produce a stand-alone document and it is inadmissible that its text overlaps with that of reports produced by other students involved in the project.

In special circumstances the internship report can be written in Dutch, but this requires special approval of the Board of Examiners. The Board of Examiners will approve reports in Dutch if this has been indicated on the Internship Approval form (see below) and if the student can prove that the company / organization needs an internship report in Dutch.
In case the internship report is written in Dutch, the report should include an internship report summary in English in the format:
- at least 5 pages (A4) text, no photo's, figures, references, etc.;
- font style: verdana 9 pt;
- margin: 2 cm each side.

The credit load of an internship can be between 15 and 30 ECTS credits corresponding to a duration of approximately between 3 and 6 months. A longer internship is possible but the maximum number of ECTS credits which can be earned in one internship is 30.

How to find an internship
In a first instance, it is the responsibility of the student to find an internship. On the MSc Earth Sciences Internship community on Blackboard you can find companies and institutions that have hosted interns previously. Many students look around for themselves, talk to students who have already done an Internship or contact a staff member active in the direction of their interest.

Before starting an Internship, the planning of the Internship has to be approved by the Internship Coordinator and the Board of Examiners. The proposal has to contain **the completed and signed Internship Approval Form** (see below) including an attachment containing the following information:

- **Name, address and country of host institution and contact person**
- **Number of ECTS**
- **Title of the project**
- **Project description**: Contents of the internship, outline of the research, outline of the methodology, outline of the expected results and deliverables The project description should not exceed 1000 words.
- **Time planning of the project**
  Start and finish date are indicated in the time planning.
  The time planning has to be consistent with the number of ECTS credits; 1 week with 40 working hours corresponds to 1.43 ECTS credits (or 28 working hours = 28 ECTS credits). The length of the project has to be planned in a way that public holidays are excluded in the calculation of the total number of working hours.

  For example, You plan to work from May 1st 2015 to August 15th 2015, i.e., 76 week days. However, the company will be closed on May 1st (Labor Day), May 14th (Ascension Day) and Pentecost Monday (May 25). You plan to take the day off to celebrate your holiday on June 10th. This leaves 72 work days.

If you work the typical 38 hours per week this results in (72 days)x(38 hours)/(5 days)/(28 hours/ECTS)=19,5 ECTS credits. Note that a maximum of 30% of the overall period can be used for "getting started/acquainted".

Once completed and signed by all involved, the internship proposal is to be handed it with the internship coordinator Rob Govers (r.govers@uu.nl). If he approves, he will forward the proposal with a positive advice to the Board of Examiners. The Board of Examiners will send you an approval via e-mail.

At the end of the Internship, the supervisor at the host institution and the UU supervisor, grade the project. The evaluation of the project will be based on the Traineeship Rubric Earth Sciences. Note, the Rubric contains two parts, one will be filled in by the external supervisor and the second part by the UU supervisor. The UU supervisor is responsible to determine the final grade. The Rubric can be found on SURFdrive or can be requested from the teaching institute.

The Rubric should be discussed with the student and has to be signed by both supervisors. The signed Rubric has to be sent to the Internship Coordinator who will forward it to Student Affairs Geosciences.

An electronic copy of the final report has to be sent to both the Internship Coordinator (r.govers@uu.nl) and to the Board of Examiners via es.theses@uu.nl .

Internship assessmentform (for internal and external supervisor) plus support sheet can be found on Blackboard (https://uu.blackboard.com) or at SURFdrive.

MSc Internship Earth Sciences (GEO4 -1500)
Approval Form

Student

Student number: ……

Name: ……

E-mail address: ……

Address (complete): ……

Telephone number: ……

MSc programme:……

Topic of the internship: ……

Internship planned at (name organisation): ……

Language of the internship:……

Period internship: …… till: …… ECTS credits: ……

Date: …… Signature student: ……

Internal UU supervisor (from department of Physical Geography or department of Earth Sciences)

Name: ……
will function as internship tutor for the above mentioned student, and approves of the proposed research outline and research planning as presented in the attachment.

Date: …… Signature UU supervisor: ……

MSc Earth Sciences Board of Examiners

Advice of Internship Coordinator: Accept / Reject

Date: ……..... Signature: ……

Final approval of the board of examiners: Yes / No ECTS credits: ……

Date: …… Signature: ……

MSc Internship Earth Sciences (GEO4 -1500)

Attachment

Name:
Student number:
e-mail:

Host institution and contact person

ECTS Credits:
Title:

Project description
Content/ objectives

Methodology

Abroad

Expected results / deliverables / language

Time Planning

Date / Period	Activity	ECTS
	First version of report submitted	
	Final version of report submitted	

Appendix 4

Education and Examination Regulations for the Master's degree programmes in

- **Earth Sciences**
- **Energy Science**
- **Environmental Sciences**
- **Geographical Sciences**
- **Human Geography and Planning**
- **Science and Innovation**
- **Development Studies**
- **Spatial Planning**
- **Human Geography**

2021-2022

Graduate School of Geosciences
Utrecht University

May, 2021

SECTION 1 – GENERAL PROVISIONS 62
art. 1.1 – applicability of the Regulations .....
art. 1.2 – definition of terms.....
SECTION 2 – ADMISSION 63
art. 2.1 – admission requirements of the degree programmes .....
art. 2.2 – English language (for Master's Degree Programmes taught in English) .....
art. 2.3 – admissions procedures .....
art. 2.4 – deficiencies .....
SECTION 3 – CONTENTS AND STRUCTURE OF THE DEGREE PROGRAMMES 64
art. 3.1 – aim of the degree programmes.....
art. 3.2 – mode of attendance .....
art. 3.3 – language of instruction .....
art. 3.4 – study load.....
art. 3.5 – programmes; start dates .....
art. 3.6 – components of the Master's programmes.....
art. 3.7 – courses taken at another Dutch research university .....
art. 3.8 – courses taken at a foreign research university .....
art. 3.9 – components taken elsewhere .....
art. 3.9a - destination with negative travel advice .....
art. 3.10 – actual teaching structure.....
SECTION 4 – COURSES 66
art. 4.1 – course .....
art. 4.2 – course admission requirements.....
art. 4.3 – registration for courses.....
art. 4.4 – attendance and effort requirements .....
art. 4.5 – participate in courses; priority rules .....
art. 4.6 – complete courses for international students before winter break .....
art. 4.7 – evaluation of the quality of education .....
SECTION 5 – TESTING 67
art. 5.1 – general.....
art. 5.2 – Board of Examiners.....
art. 5.3 – assessment of traineeship or research assignment and thesis.....
art. 5.4 – grades.....
art. 5.5– repeat exams: supplementary tests .....
art. 5.6– force majeure: replacement tests .....
art. 5.7 – type of test .....
art. 5.8 – oral tests .....
art. 5.9 – provision for testing in special cases.....
art. 5.10 – time limit for grading tests .....
art. 5.11 – period of validity .....
art. 5.12 – right of inspection .....
art. 5.13 – retention of tests .....
art. 5.14 – exemption.....
art. 5.15 – fraud and plagiarism.....
art. 5.16 – control of plagiarism.....
art. 5.17 – right of appeal .....
SECTION 6 – EXAMINATION 71
art. 6.1 – examination .....
art. 6.2 – cum laude classification .....
art. 6.3 – degree.....
art. 6.4 – degree certificate and International Diploma Supplement (IDS).....
art. 6.5 – grading tables .....
SECTION 7 – STUDENT COUNSELLING 72
art. 7.1 – student progress administration.....
art. 7.2 – student counselling .....
art. 7.3 – disability and chronic illness .....
SECTION 8 – TRANSITIONAL AND FINAL PROVISIONS 73
art. 8.1 – safety net arrangements.....
art. 8.2 – amendments .....
art. 8.3 – publication .....
art. 8.4 – effective date .....

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 11 May 2021.

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 2021-2022.
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, equivalent to a Dutch bachelor's 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 – 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. A request to be admitted to the Master's degree programme and a specific programme must be submitted to the Board of Admissions before the relevant deadline on the prospective student website (www.uu.nl/masters or www.uu.nl/internationalmasters). Requests submitted after these deadlines will not be considered. The decision not to process the request refers to the possibility of appeal to the Examination Appeals Board.
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.

art. 2.4 – 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.

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-omrekentabel. 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 alphanumerical 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).

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. 3.9a - destination with negative travel advice

1. Components for which the student must travel to areas abroad or the Caribbean part of the Kingdom for which the Ministry of Foreign Affairs has given a travel advice of classification red (do not travel) or orange (only necessary travel) during the period that the course will be followed, cannot be entered in the degree programme.
2. On behalf of the Dean, the provisions of the first paragraph may be deviated from in exceptional circumstances. Permission can only be given in case:
   - it concerns an obligatory part of the study,
   - for which there is no alternative, and
   - it is necessary that this is followed, and
   - there are, in the opinion of the UU, sufficient guarantees that safety and health are guaranteed.

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;
   - share answers with others while taking a test;
   - seeking the help of third parties during a test;
   - 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 of 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;
   - perform (or try to perform) technical changes that undermine the online testing system;
   - 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 of any sanctions in accordance with the stipulations of the fourth paragraph, stating the possibility of appeal to the Examination Appeals Board.
4. The Board of Examiners is authorized to impose sanctions. In doing so, the Board of Examiners shall ensure that the sanction is proportionate: the consequences of the sanction shall be in proportion to the degree and seriousness of the fraud or plagiarism committed.
5. One or more of the following sanctions may be imposed, depending on the nature and extent of the fraud or plagiarism committed, and the circumstances in which the fraud or plagiarism was committed, as well as the student's study phase:
   - invalidation of the paper or test submitted;
   - reprimand, a note of which will be made in OSIRIS.
   - removal from the course;
   - no longer being eligible for a positive degree classification (cum laude) as referred to in article 6.2;
   - exclusion from participation in tests belonging to the course concerned for the current academic year, or for a maximum period of 12 months;
   - complete exclusion from participation in all tests for a maximum period of 12 months.

6. 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 programme.
7. 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 2021.

o – o – o

APPENDIX 4.1

Programme-specific part of the Education and Examination Regulations 2021-2022
Master's degree programme in Earth Sciences
Graduate School of Geosciences

The Master's degree programme *Earth Sciences* offers the programmes *Earth, Life and Climate*, *Earth Structure and Dynamics*, *Earth Surface and Water and Marine Sciences.*

Art. 2.1 – Admission requirements

1. The following conditions for admission apply:

Admission to the programme ***Earth, Life and Climate*** is granted to students with a Dutch or a foreign diploma confirming that they have acquired the knowledge, insight and skills at 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 *Earth Sciences*, *Biology* or *Chemistry*, at the advanced level of the major *Earth Sciences*, *Biology* or *Chemistry* at Utrecht University, or equivalent to this level.
b) insight into *Earth Sciences* at the advanced level of the major *Earth Sciences*, *Biology* or *Chemistry* at Utrecht University, or equivalent to this level.
c) academic and research skills at the advanced level of the major *Earth Sciences*, *Biology* or *Chemistry* at Utrecht University, or equivalent to this level.

Admission to the programme ***Earth Structure and Dynamics*** is granted to students with a Dutch or a foreign diploma confirming that they have acquired the knowledge, insight and skills at 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 *Earth Sciences* or *Physics*, at the advanced level of the major *Earth Sciences* or *Physics* at Utrecht University, or equivalent to this level.
b) insight into *Earth Sciences* at the advanced level of the major *Earth Sciences* or *Physics* at Utrecht University, or equivalent to this level.
c) academic and research skills at the advanced level of the major *Earth Sciences* or *Physics* at Utrecht University, or equivalent to this level.

Admission to the programme ***Earth Surface and Water*** is granted to students with a Dutch or a foreign diploma confirming that they have acquired the knowledge, insight and skills at 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 *Earth Sciences*, at the advanced level of the major *Earth Sciences* at Utrecht University, or equivalent to this level.
b) insight into Earth Sciences at the advanced level of the major *Earth Sciences* at Utrecht University, or equivalent to this level.
c) academic and research skills at the advanced level of the major *Earth Sciences* at Utrecht University, or equivalent to this level.

Admission to the programme ***Marine Sciences*** is granted to students with a Dutch or a foreign diploma confirming that they have acquired the knowledge, insight and skills at 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 *Earth Sciences* or *Biology*, at the advanced level of the major *Earth Sciences* or *Biology* at Utrecht University, or equivalent to this level.
b) insight into *Earth Sciences* or *Biology* at the advanced level of the major *Earth Sciences* or *Biology* at Utrecht University, or equivalent to this level.
c) academic and research skills at the advanced level of the major *Earth Sciences* or *Biology* at Utrecht University, or equivalent to this 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 students 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 which requirements must be met in order to qualify for selection.

Art. 3.1 – Aim of the degree programme
The programme aims to:
1. equip students with specialist knowledge, skills and understanding in the field of *Earth Sciences*, and to help them achieve the exit qualifications referred to in part 2 of this article
2. prepare students for a career in one or more sub-fields of *Earth Sciences*
3. prepare students for enrolling in a programme to train as a researcher in the field of *Earth Sciences*

Graduates in *Earth Sciences*:
1. have advanced knowledge of the field
2. can develop and apply (partly) original ideas in a research context;
3. can apply their knowledge and understanding, as well as their problem-solving skills in broader contexts related to the field
4. can integrate, interpolate and extrapolate knowledge at a high level, including knowledge gathered from research articles
5. show professional and critical attitude towards social, environmental and ethical aspects of the knowledge acquired and the competencies gained
6. have obtained expertise in the field of understanding, modelling and simulation of key underlying processes in the field of study
7. have developed general listening, writing and presentation skills, also geared towards non-specialist audiences
8. have developed group, team and interpersonal skills, and demonstrate skills necessary for pursuing advanced research.

More programme-specific qualifications are listed in the prospectuses of the different programmes.

Art. 3.6 – Composition of the programmes
Appendix 1 specifies the composition of the programmes.

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 and in the University course catalogue.

Art. 4.7 – Evaluation of quality of the 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.

Appendix 1: composition of the programmes

Earth, Life and Climate

Theoretical courses: required electives	45 EC
MSc research/thesis	30-45 EC
Individual programme/internship Compulsory second report	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0- 45 EC

PROGRAMME	**EARTH, LIFE AND CLIMATE**			
PROGRAMME-WIDE COURSES At least one from each block	**Earth, Life and Climate**: GEO4-1412 Astronomical climate forcing and time scales; GEO4-1440 Microbes and biogeochemistry			
	Research Instruction Earth, Life and Climate: Field research instruction Geology (GEO4-1430) or Field research instruction Geochemistry (GEO4-1431) or Master excursion Earth Surface and Water (GEO4-4418) or Ice ocean climate interactions (GEO4-1454), plus seminars and career development activities			
Recommended study path	**Integrated stratigraphy and sedimentary systems**	**Climate reconstruction**	**Biogeosciences and evolution**	**Biogeochemistry**
At least four courses from the complete offer of the programme	GEO4-1405 Paleoceanography and climate variability	GEO4-1405 Paleoceanography and climate variability	GEO4-1419 Dynamics of sedimentary systems	GEO4-1417 Advanced mineralogy: minerals as materials
	GEO4-1418 Dynamics of basins and orogens	GEO4-1419 Dynamics of sedimentary systems	GEO4-1420 Organic geochemistry	GEO4-1420 Organic geochemistry
	GEO4-1419 Dynamics of sedimentary systems	GEO4-1420 Organic geochemistry	GEO4-1422 Reconstructing extreme climate transitions	GEO4-1421 Reactive transport in the hydrosphere
	GEO4-1438 Paleomagnetism	GEO4-4409 Reconstructing Quaternary environments	GEO4-1439 Aquatic and environmental geochemistry	GEO4-1443 Stable isotopes in Earth Sciences
	GEO4-4436 River and delta systems	GEO4-4423 Hydrology climate change and cryosphere	GEO4-1514B Vertebrate evolution (tetrapods)	GEO4-1439 Aquatic and environmental geochemistry
0 to 2 courses from all programmes in the *Earth Sciences* Master's programme	0 to 2 courses from all programmes in the *Earth Sciences* Master's programme			
Professional profile	Geologist Biogeologist Sedimentologist Stratigrapher	Geologist Biogeologist Sedimentologist Paleoclimatologist	Geologist Biogeologist Sedimentologist Paleontologist	Geochemist

Earth Structure and Dynamics

Theoretical courses: required electives	45 EC
MSc research/thesis	30-45 EC
Individual programme/internship Compulsory second report	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0- 45 EC

PROGRAMME	**EARTH STRUCTURE AND DYNAMICS**		
PROGRAMME-WIDE COURSES At least <u>one</u> from each block	**Earth Structure and Dynamics**: Structure and composition of the Earth's interior (GEO4-1401); Structural analysis of deformed rocks (GEO4-1411); Paleomagnetism (GEO4-1438)		
	Research instruction Earth Structure and Dynamics: Applied geophysics (GEO4-1424a) or Field research instruction geology (GEO4-1430), plus seminars and career development activities		
Recommended study path	**Physics of the solid earth and planets**	**Basins, orogens and the crust-lithosphere system**	**Earth materials**
At least <u>four</u> courses from the complete offer of the programme	GEO4-1408 Theoretical seismology	GEO4-1409 Tectonophysics	GEO4-1403 Petrological and geochemical evolution of the Earth
	GEO4-1409 Tectonophysics	GEO4-1416 Dynamics of the Earth's mantle	GEO4-1410 Mechanisms of deformation and transport in rocks
	GEO4-1415 Data processing and inverse theory	GEO4-1418 Dynamics of basins and orogens	GEO4-1417 Advanced mineralogy: minerals as materials
	GEO4-1416 Dynamics of the Earth's mantle	GEO4-1419 Dynamics of sedimentary systems	GEO4-1443 Stable isotopes in Earth Sciences
	GEO4-1427 Computational geophysics	GEO4-1442 Modelling of crust and lithosphere deformation	GEO4-1435 Advanced petrology: from microscopic properties to geological processes
0 to 2 courses from all programmes in the *Earth Sciences* Master's programme	0 to 2 courses from all programmes in the *Earth Sciences* Master's programme		
Professional profile	Geophysicist	Geophysicist Geologist	Geologist

Earth Surface and Water

Theoretical courses: required electives	45 EC
MSc research/thesis	30-45 EC
Individual programme/internship Compulsory second report	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0-45 EC

PROGRAMME-WIDE COURSES At least <u>one</u> from each block	**Earth Surface and Water**: Principles of groundwater flow (GEO4-1434); Statistics and data analysis in Physical Geography (GEO4-4412); Advanced GIS for geoscientists (GEO4-4433)			
	Research Instruction Earth Surface and Water: Field research instruction Geochemistry (GEO4-1431) or Environmental hydrogeology (GEO4-1432) or Master's excursion Earth Surface and Water (GEO4-4418) or Hydrology and climate (GEO4-4423), plus seminars and career development activities			
Recommended study path	**Environmental geochemistry**	**Hydrology**	**Coastal dynamics and fluvial systems**	**Geohazards and earth observation**
At least <u>four</u> courses from the complete offer of the programme	GEO4-1421 Reactive transport	GEO4-1421 Reactive transport	GEO4-4403 Managing future deltas	GEO4-4404 Land surface hydrology
	GEO4-1443 Stable isotopes in Earth Sciences	GEO4-1433 Hydrogeological transport phenomena	GEO4-4409 Reconstructing Quaternary environments	GEO4-4406 Land surface process modelling
	GEO4-1433 Hydrogeological transport phenomena	GEO4-4404 Land surface hydrology	GEO4-4434 Morphodynamics of wave-dominated coasts	GEO4-4408 Remote sensing
	GEO4-1439 Aquatic and environmental geochemistry	GEO4-4406 Land surface process modelling	GEO4-4435 Morphodynamics of tidal systems	GEO4-4417 Unsaturated zone hydrology
	GEO4-6001 Quantitative water management	GEO4-4417 Unsaturated zone hydrology	GEO4-4436 River and delta systems	GEO4-4425 Hazards and risk assessment
0 to 2 courses from all programmes in the *Earth Sciences* Master's programme	0 to 2 courses from all programmes in the *Earth Sciences* Master's programme			
Professional profile	Geochemist	Hydrologist	Physical geographer Specialist in morphodynamics	Physical geographer Specialist in geohazards / remote sensing

Marine Sciences

Theoretical courses	45 EC
Elective courses	15-30 EC
MSc research/thesis	30-45 EC
Individual programme/internship Compulsory second report	up to 30 EC

Marine Sciences	Compulsory	GEO4-1451 Introduction to Marine Sciences GEO4-1452 Ocean Law and Policy
At least <u>one</u> course from different core disciplines	Physics	GEO4-1453 Introduction to Physical oceanography NS-MO401M* Dynamical oceanography NS-MO447M* Wave attractors (old: Ocean waves) NS-MO502M* Making, analysing and interpreting observations NS-MO503M* Earth system modelling
	Earth Sciences	GEO4-1405 Paleo oceanography & climate variability GEO4-1412 Astronomical climate forcing & time scales GEO4-1419 Dynamics of sedimentary systems GEO4-1422 Evolutionary palaeobiology and proxies GEO4-1454 Ice ocean climate interactions GEO4-4434 Morphodynamics of wave-dominated coasts GEO4-4435 Morphodynamics of tidal systems
	Chemistry	GEO4-1420 Organic geochemistry GEO4-1421 Reactive transport GEO4-1443 Stable isotopes in Earth Sciences (new course) GEO4-1431 Field research instruction geochemistry GEO4-1439 Aquatic and environmental geochemistry
	Biology	GEO4-1440 Microbes and biogeochemistry GEO4-1450 Coastal ecology

Appendix 5

REGULATIONS OF THE BOARD OF EXAMINERS GRADUATE SCHOOL GEOSCIENCES

STUDY PROGRAMMES EARTH SCIENCES AND

UTRECHT UNIVERSITY 2021-2022

June, 2021

Regulations of the Board of Examiners
(Rules & Guidelines pursuant to Section 7.12 (b)(3) of the Higher Education and Research Act)

Regulations of the Board of Examiners adopted by the Board of Examiners for the Graduate School of Geosciences at Utrecht University, on June 8, 2021.

Valid from September 1, 2021

Disclaimer: This translation is provided for information purposes only. Inevitably, differences may occur in translation, and if so, the Dutch version will prevail.

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.

Contents:

PARAGRAPH 1 – GENERAL STIPULATIONS 82
Art. 1.1 – scope of application .....
Art. 1.2 – Board of Examiners .....
Art. 1.3 – standards .....
Art. 1.4 - examiners .....
PARAGRAPH 2 – ORGANIZATION OF TESTS AND PROPER PROCEDURE 83
Art. 2.1 – times of tests .....
Art. 2.3 – order during a written or digital test .....
PARAGRAPH 3 – ASSESSMENT OF TESTS, THESIS 83
Art. 3.1 – marking of test .....
Art. 3.2 – assessment of thesis, research assignments, graduate theses .....
Art. 3.3 – subsequent discussion .....
Art. 3.4 – recording the final results .....
PARAGRAPH 4 – ASSURING THE QUALITY OF EXAMINATIONS 84
Art. 4.1 – assuring the quality of testing .....
Art. 4.2 – determining the quality of testing .....
Art. 4.3 - declaration of invalidity of test for all participant due to quality shortcomings .....
Art. 4.3a - declaring online proctored tests invalid in the event of irregularities .....
Art. 4.4 – assuring the quality of examinations (final level of the graduates) .....
Art. 4.5 – Board of Examiners' own investigation to maintain quality of examination .....
PARAGRAPH 5 - EXEMPTIONS, APPROVAL OF COURSE UNITS 85
Art. 5.1 – exemption .....
Art. 5.2 – approval of course units .....
PARAGRAPH 6 – COMPLAINTS 86
Art. 6.1 - Complaints about testing and marking .....
Art. 6.2 - Appeal against decisions concerning testing and marking .....
PARAGRAPH 7 – FINAL PROVISIONS 86
Art. 7.1 – annual report .....
Art. 7.2 – amendments .....
Art. 7.3 – entering into force and publication .....

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 chairman, or his/her replacement, has a casting vote.
3. The chair and all members of the Board of Examiners, excluding the external member, 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.
3. The Board of Examiners will register all examiners so that it is known which persons are authorized to administer examinations and to determine the results thereof.

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 a written or digital 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.
3.

Art. 4.3 – declaration of invalidity of test for all participants due to quality shortcomings

1. If it becomes apparent that the test has such serious quality shortcomings that it cannot be ascertained whether and to what extent the students have achieved the learning objectives of the course, by virtue of its quality assurance role pursuant to Section 7.12b (1)(a) of the Higher Education and Research Act the Board of Examiners may decide immediately that the examination concerned is invalid, and that all participants must repeat the entire examination as soon as possible. The Board of Examiners will set the date on which the examination will be repeated. This date will be no later than two weeks after establishing the quality shortcomings, so that the participants will still be able to benefit from their preparations for the examination.

2. Except in the event of fraud or plagiarism as referred to in Art. 5.15 of the Education and Examination Regulations, the Board of Examiners may no longer declare a test invalid if the final test results have already been published.

Art. 4.3a – declaring online proctored tests invalid in the event of irregularities

1. The Board of Examiners may declare an online proctored test of one or more students invalid if during the test there has been insufficient insight in the possibility of fraud, or if circumstances have been insufficiently fraud-poof.
2. If the situation referred to in the first paragraph is the result of an irregularity that is at the risk and expense of the student, the student will not be given another chance. If a situation arises outside the student's control that the student reports during the test, the student may request another chance. If the situation is at the risk and expense of the university, a new test opportunity will be scheduled.
3. An irregularity at the risk and expense of the student exists if the student has not followed the instructions for the online proctored test.

Art. 4.4 – 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. 4.5 – 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 2021.
2. The Board of Examiners will ensure the publication of these regulations, as well as any amendment thereto, via the internet.

NOTES: