



JACOBS
UNIVERSITY



Study Program Handbook

Earth and Environmental Sciences

Bachelor of Science

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1 The Earth and Environmental Sciences (EES) Study Program

1.1 Concept

The Earth and Environmental Sciences (EES) program is an interdisciplinary environmental science major and provides an understanding of the natural functioning of our planet and the consequences of human impact. It combines traditional geoscience disciplines like Geochemistry, Geophysics, and Oceanography with Environmental Sciences and Social Sciences.

EES prepares our graduates for topical challenges and research questions such as the management and sustainable exploration of natural resources, the study of Earth's climate and oceans. Participation in field and laboratory work as well as teamwork in multidisciplinary and multicultural groups are an important part of the studies.

1.2 Specific Advantages of the EES Program at Jacobs University

The study of Earth and Environmental Sciences will give you an excellent foundation for future careers in academic and applied fields ranging from geosciences and oceanography to climate and environmental research. You may work in international space agencies and NGOs, for mining and oil companies, or for media, press departments or publishing companies.

Our teaching philosophy emphasizes an interdisciplinary view of the world, focuses on a mixture of theoretical and hands-on practical work, and provides problem-solving skills that are in high demand from employers. This opens a wide variety of potential career paths.

Moreover, in the Earth and Environmental Sciences program, teaching and teamwork, helpdesks and personal training will provide you with a sound background in the natural sciences and mathematics. Mandatory courses in the social sciences and soft skills acquired in seminars, laboratory courses and field camps will prepare you for a leading role in today's world.

1.3 The Jacobs University Employability and Personal Development Concept

Jacobs University's educational concept aims at fostering employability which refers to skills, capacities, and competencies which transcend disciplinary knowledge and allow graduates to quickly adapt to professional contexts. Jacobs University defines employability as encompassing not just technical skills and understanding but also personal attributes and qualities enabling students to become responsible members of their professional and academic fields as well as of the societies they live in.

Graduates of JU will be equipped with the ability to find employment and to pursue a successful professional career, which means that

- graduates possess the ability to acquire knowledge rapidly, to assess information and to evaluate new concepts critically;
- graduates have communicative competences which allow them to present themselves and their ideas and to negotiate successfully;

- graduates are familiar with business-related processes and management skills and are able to manage projects efficiently and independently.

Graduates of JU will also be equipped with a foundation to become globally responsible citizens, which includes the following attributes and qualities:

- graduates have gained intercultural competence; they are aware of intercultural differences and possess skills to deal with intercultural challenges; they are familiar with the concept of tolerance;
- graduates can apply problem-solving skills in negotiating and mediating between different points of view;
- graduates can rely on basic civic knowledge and have an understanding for ethical reasoning; students are familiar with the requirements for taking on responsibility.

1.4 Career Options

Career opportunities include:

- Industry - searching for and managing natural resources such as water, fossil fuels and minerals on land and in the ocean.
- Academia - research and teaching at universities and research facilities; teaching in schools and colleges; museum work.
- (Environmental) management and consulting - investigating and monitoring ground conditions associated with planning, construction, land/ocean use, reclamation of contaminated land/seafloor, and waste disposal.
- Geological surveying - collecting surface and subsurface geological information, onshore and offshore, for geological, geophysical and geochemical databases.
- Developing methods, strategies and policies for renewable energy and sustainable resource exploitation.
- Planning satellite missions for Space Agencies.
- Working as science journalists or for publishing companies.
- Pursuing an academic career in
 - Geosciences
 - Ocean sciences
 - Environmental sciences
 - Resource exploration and management
 - Applied and theoretical physics and astronomy

In the high-ranking journal *Nature*, a recent article from May 2011 pointed out the superb prospects for the future job market related to Earth sciences (*Nature* 473, 243-244): „There’s good news for aspiring geoscientists. Job opportunities at all career stages are on the rise. There’s room for those who love field work, and there’s room for those who don’t. Job prospects for geoscientists are excellent and are set to get even better. . Many of today’s senior geoscientists were trained as specialists in relatively narrow disciplines, but in future,

most demand will be for researchers who have been trained to appreciate the interdisciplinary nature of the Earth sciences. For those willing to get interdisciplinary training, the future looks bright. The job market is flushed with opportunities.”

For more details see: <http://earth.user.jacobs-university.de/careers-jobs-earth-environmental-sciences/>

1.5 More Information and Contact

For more information please contact the study program coordinator:

Dr. Michael Bau
Professor of Geosciences
Email: m.bau@jacobs-university.de
Telephone: +49 421 200-3102

or visit our program website: <http://earth.user.jacobs-university.de/>

2 The Curricular Structure

2.1 General

The undergraduate education at Jacobs University equips students with the key qualifications necessary for a successful academic, as well as professional career. By combining disciplinary depth and transdisciplinary breadth, supplemented by skills education and extracurricular elements, students are prepared to be responsible and successful citizens within the societies they work and live in.

The curricular structure provides multiple elements enhancing employability, transdisciplinarity, and internationality. The unique Jacobs Track, offered across all study programs, provides a broad range of tailor-made courses designed to foster career competencies. These include courses which promote communication, technology, business, (German) language, and management skills. The World Track, included in the third year of study, provides extended company internships or study abroad options. Thus students gain training on the job and intercultural experiences. All undergraduate programs at Jacobs University are based on a coherently modularized structure, which provides students with a broad and flexible choice of study plans to meet their major as well as minor study interests.

The policies and procedures regulating undergraduate study programs at Jacobs University in general can be found on the website.

2.2 The Jacobs University 3C-Model

Jacobs University offers study programs according to the regulations of the European Higher Education Area. All study programs are structured along the European Credit Transfer System (ECTS), which facilitates credit transfer between academic institutions. The three-year undergraduate program involves six semesters of study with a total of 180 ECTS credits. The curricular structure follows an innovative and student-centered modularization scheme - the 3C-Model - which groups the disciplinary content of the three study years according to overarching themes:

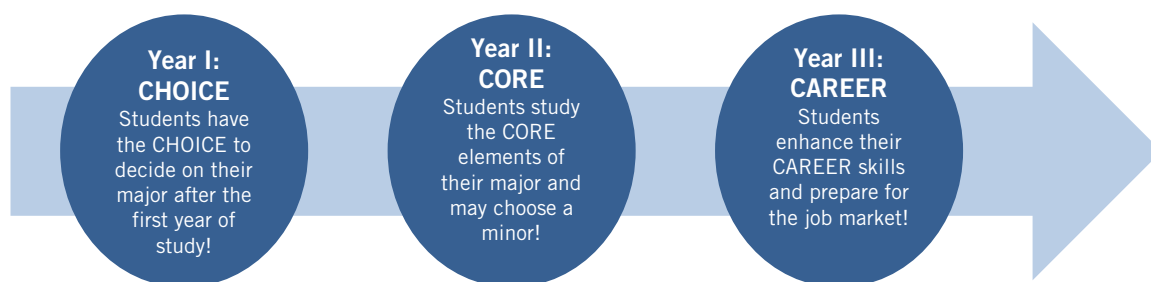


Figure 1: The Jacobs University 3C-Model

2.2.1 YEAR 1 - CHOICE

The first study year is characterized by a broad offer in disciplinary and interdisciplinary education. Students select three CHOICE modules from a variety of study programs. As a unique asset, our curricula allow students to select their study program freely from among the three selected CHOICE modules during their first year of study.

2.2.2 YEAR 2 - CORE

In the second year, students take three in-depth, discipline-specific CORE modules. One CORE module can also be taken from a second, complementary discipline, which allows students to incorporate a minor study track into their undergraduate education. Students will generally qualify for a minor if they have successfully taken at least one CHOICE module and one CORE module in a second field, and this extra qualification will be highlighted in the transcript.

2.2.3 YEAR 3 - CAREER

During their third year, students must decide on their career after graduation. In order to facilitate this decision, the fifth semester introduces two separate tracks. By default students are registered for the World Track.

1. The World Track

In this track there are two mandatory elective options:

- **Internship**

The internship program is a core element of Jacobs University's employability approach. It includes a mandatory semester-long internship off-campus (minimum 16 weeks in full-time) which provides insight into the labor market as well as practical work experience related to the respective area of study. Successful internships may initiate career opportunities for students. For more information, please contact the Career Services Center (<http://www.jacobs-university.de/career-services/contact>).

- **Study Abroad**

Students can take the opportunity to study abroad at one of our partner universities. Courses recognized as study abroad credits need to be pre-approved according to the Jacobs University study abroad procedures and carry minimum of 20 ECTS credits in total. Several exchange programs allow you to be directly enrolled at prestigious partner institutions worldwide. Jacobs University's participation in Erasmus+, the European Union's exchange program, provides an exchange semester at a number of European universities including Erasmus study abroad funding.

For more information, please contact the International Office (<http://intoffice.user.jacobs-university.de/outgoing/>).

2. The Campus Track

Alternatively, students may also opt to follow the Campus Track by continuing their undergraduate education at Jacobs, namely by selecting an additional CORE module during their third year and redistributing the remaining courses and modules across the

third year. This opportunity can be used by students to more intensively focus on their major or to fulfill the minor requirements for a second field of interest.

In the sixth semester, all students select from a range of specialization courses within their study program and concentrate on their Bachelor thesis in the context of a Project/Thesis Module.

All students attend a mandatory set of career skills courses and events throughout their studies. These equip them with necessary skills for their 5th semester and their future career.

2.3 The Jacobs Track

The Jacobs Track, another stand-alone feature of Jacobs University, runs parallel to the disciplinary CHOICE, CORE, and CAREER modules across all study years and is an integral part of all study programs. It reflects our commitment to an in-depth methodological education, it fosters our transdisciplinary approach, it enhances employability, and equips students with extra skills desirable in your general field of study. Additionally, it integrates essential language courses.

Mathematics, statistics, and other methods courses are offered to all students within a comprehensive Methods Module. This module provides students with general foundations and transferable techniques which are invaluable to follow the study content not only in the study program itself but also in related fields.

The Skills Module equips students with general academic skills which are indispensable for their chosen area of study. These could be, for example, programming, data handling, presentation skills, and academic writing, scientific and experimental skills.

The transdisciplinary Triangle Module offers courses with a focus on at least one of the areas of business, technology and innovation, and societal context. The offerings comprise essential knowledge of these fields for students from other majors as well as problem-based courses that tackle global challenges from different disciplinary backgrounds. Working together with students from different disciplines and cultural backgrounds in these courses broadens the students horizon by crossing the boundaries of traditional disciplines.

Foreign languages are integrated within the Language Module. Communicative skills and foreign language competence foster students intercultural awareness and enhance their employability in a globalized and interconnected world. Jacobs University supports its students in acquiring and improving these skills by offering a variety of language courses at all proficiency levels. Emphasis is put on fostering German language skills, as they are an important prerequisite for students to learn about, explore, and eventually integrate into their host country. Hence, acquiring 10 ECTS credits in German is a requirement for all students. Students who meet the requirements of the German proficiency level (e.g. native speakers) are required to select courses in any other language program offered.

2.4 Modularization of the Earth and Environmental Sciences Program

2.4.1 Content

Year 1

Take two mandatory modules listed below and select one further CHOICE module from a different study area.

Inorganic Chemistry and Environmental Systems (CH04-InorgChem)

The bifunctional module Chemistry and Environmental Systems provides an introduction to (inorganic) chemistry and to the anthropogenic impact on the natural (near-)surface environment of Earth. Two introductory lecture courses (Introduction to Inorganic Chemistry (focus on the elements of the PSE, molecular compounds derived from them, redox reactions) and Earth and Environmental Systems (focus on Geodynamics, Petrography, Soil Science, Oceanography, Hydrogeology, Geomorphology, and anthropogenic impact on the (near-)surface environment) are complemented by an on-campus laboratory course (Inorganic Chemistry Lab) and an off-campus field-lab (excursion) to develop fundamental practical skills.

Physics of Natural Systems (CH05-PhysNatSys)

Physics of Natural Systems provides an introduction to the physical description of natural phenomena and covers fundamental topics in physics and earth and environmental sciences (EES). Important concepts from mechanics, thermodynamics, fluid dynamics, electromagnetism, atoms and nuclei are introduced and applied to essential processes in Earth, marine, and planetary sciences. Structure and dynamics of natural systems are studied with moderate use of mathematics. Practical sessions will cover important experimental techniques and tools. This module provides a foundation for the higher level EES and Physics modules Earth, Ocean, and Environmental Physics, Physics and Technology, Theoretical Physics, and Physics of Matter.

Year 2

Take all three modules or replace one with a CORE module from a different study program.

Fundamental Earth and Environmental Sciences (CO10-FundEES)

The module Fundamental Earth and Environmental Sciences is comprised of essential geoscience courses that represent the backbone of a sound university education in the geosciences. Core courses on Sedimentology, Structural Geology, Volcanism and Metamorphism are complemented by applied courses in environmental and resource geoscience. If relevant, both marine and terrestrial systems are discussed. A key element of these courses are on-campus practicals during which the students are introduced to geological methods and techniques. These essential practical skills are further expanded upon and applied in a real-world scenario during a five day off-campus geological field camp.

Earth, Ocean and Environmental Geochemistry (CO11EOEnvChem)

The module Earth, Ocean and Environmental Geochemistry is comprised of fundamental geochemistry courses that represent the backbone of a sound university education in geochemistry and geochemistry-focussed environmental and resource science. Core courses on igneous and aqueous (trace) element geochemistry and introductory courses on stable and radiogenic iso-

tope geochemistry are complemented by a course on the biogeochemical aspects of environmental and resource science and an off-campus field camp focusing on environmental sciences. All courses address terrestrial as well as marine systems.

Earth, Ocean and Environmental Geophysics (CO12-EOEnvPhys)

The module Earth, Ocean, and Environmental Physics covers topics and methods that are essential in geophysics and physical oceanography. Emphasis will be on the quantitative assessment of physical processes and structures in terrestrial and marine systems. Important concepts are introduced and studied in lectures, and then applied and consolidated in practical courses such as field trips and computer labs on remote sensing and data analysis. The module constitutes one of the CORE pillars of the Earth and Environmental Sciences (EES) program and in general may complement the education of students interested in a physics-based presentation of fundamental EES topics.

Some CORE Modules require students to have taken a specific CHOICE Module. Please see the Module Handbook for details regarding pre-requisites.

Year 3

In the 3rd year students follow the World Track by default:

1. World Track

5th Semester

- Internship / study abroad

6th Semester

- Earth and Environmental Sciences Project / Thesis Module
- Program-specific Specialization Module Exemplary course offering:
 - Earth and Ocean Field Lab
 - Dynamics of Marine Systems
 - Climate Change
 - Geophysical methods for oil and gas exploration
 - Marine Resources
 - Geoecology and Sustainability
 - Energy: From Fossil Fuels to Renewables
 - Earths Surface Environments: Soil and Freshwater Systems
 - Environmental Physics

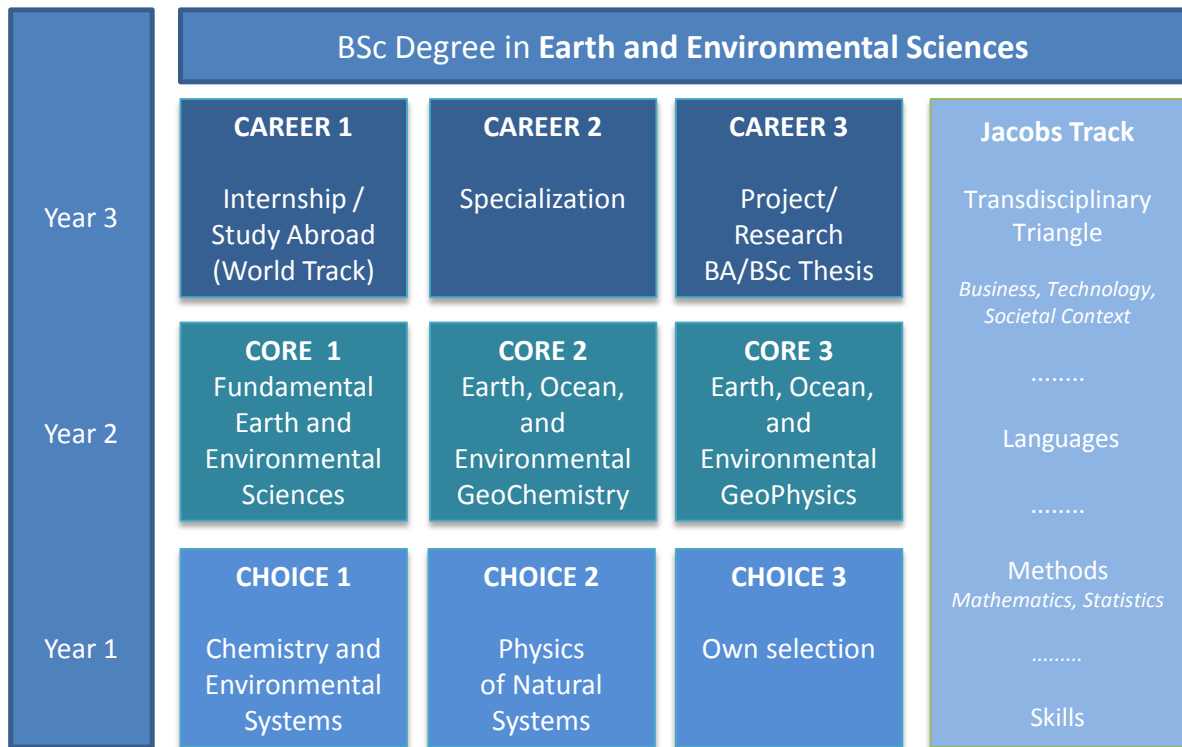
2. Campus Track

Students who do not enter the World Track follow the Campus Track.

5th and 6th Semester

- Program-specific Project / Thesis Module
- Program-specific Specialization Module
(please see World Track for exemplary course offering)
- Additional CORE Module

2.4.2 Structure



YEAR 1 *Take three CHOICE modules, one free selection*
YEAR 2 *Take three CORE modules, one CORE module can be substituted by a CORE module from a second study program to pursue a minor*
YEAR 3 *Alternatively Campus Track with a 4th CORE module instead of internship/study abroad module*

Figure 2: Earth and Environmental Sciences Module Structure

3 Appendix 1a/1b: Mandatory Course Plans for World Track and Campus Track

Jacobs University Bremen reserves the right to substitute courses by replacements and/or reduce the number of mandatory/mandatory elective courses offered

Appendix 1a - Mandatory Course Plan for World Track

Earth and Environmental Sciences – World Track					Matriculation Fall 2015						
Program-Specific Modules					Jacobs Track Modules (General Education)						
Type	Status ¹	Semester	Credits		Type	Status ¹	Semester	Credits			
Year 1 - CHOICE					Year 1 - CHOICE						
45					20						
<i>Take the two mandatory CHOICE modules listed below, these are a requirement for the EES program.</i>											
CH04-InorgChem	Module: Inorganic Chemistry and Environmental Systems			m	15	JT-ME-MethodsMath	Module: Methods / Mathematics			m	7,5
CH04-210131	Introduction to Earth and Environmental Systems A	Lecture	m	1	2,5	JT-ME-120106	Applied Calculus I	Lecture	m	1	2,5
CH04-210132	Introduction to Earth and Environmental Systems B	Lecture	m	2	2,5	JT-ME-120107	Applied Calculus II	Lecture	m	1	2,5
CH04-210111	GeoEnvironmental Systems and their Chemistry - Field Lab	Excursion	m	2	2,5	JT-ME-120101	Mathematical Concepts in the Sciences	Lecture	m	2	2,5
CH04-400108	Inorganic Chemistry I A	Lecture	m	1	2,5	JT-SK-Skills	Module: Skills			m	2,5
CH04-400109	Inorganic Chemistry I B	Lecture	m	2	2,5	JT-SK-990103	Scientific and Experimental Skills	Lecture	m	1	2,5
CH04-400111	Inorganic Chemistry I Lab	Lab	m	1	2,5	JT-TA-TriArea	Module: Triangle Area			m	5
CH05-PhysNatSys	Module: Physics of Natural Systems			m	15	Take two courses from the triangle (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT) area. Each counts 2,5 ECTS ³					
CH05-200104	Classical Physics	Lecture	m	1	5	JT-LA-Language	Module: Language			m	5
CH05-200114	Classical Physics Lab	Lab	m	1	2,5	Take two German courses (2,5 ECTS each). Native German speakers take courses in another offered language					
CH05-210132	Introduction to Earth and Marine Systems	Lecture	m	2	5						
CH05-210133	Introduction to Mineralogy	Lecture	m	2	2,5						
Module: CHOICE (own selection)				e	1/2	15					
<i>Students take one further CHOICE module from those offered for all other study programs. ²</i>											
Year 2 - CORE					Year 2 - CORE						
45					20						
<i>Take all three modules or replace one with a CORE module from a different study program. ²</i>											
CO10-FundEES	Module: Fundamental Earth and Environmental Sciences			me	15	JT-ME-MethodsMath	Module: Methods / Mathematics			m	7,5
CO10-210201	Volcanism and Metamorphism	Lecture	m	3	2,5	Take three Methods (mandatory) elective courses (2,5 ECTS each). ²					
CO10-210203	Sedimentology	Lecture	m	3	2,5	Lecture	me	3/4	7,5		
CO10-210206	Structural Geology	Lecture	m	3	2,5						
CO10-210204	Marine Environments	Lecture	m	4	2,5	JT-TA-TriArea	Module: Triangle Area			m	7,5
CO10-210205	Climate Change	Lecture	m	4	2,5	Take three courses from the triangle (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT) area. Each counts 2,5 ECTS ³					
CO10-041202	Fieldtrip Environmental Changes and Challenges in Northwestern Germany	Excursion	m	4	2,5						
CO11-EOEnvChem	Module: Earth, Ocean, and Environmental GeoChemistry			me	15	JT-LA-Language	Module: Language			m	5
CO11-210241	Geochemistry of Igneous and Aqueous Systems	Lecture	m	3	2,5	Take two German courses (2,5 ECTS each). Native German speakers take courses in another offered language					
CO11-210302	Environmental Geochemistry	Lecture	m	3	2,5						
CO11-210362	Applied Geochemistry	Lecture	m	4	2,5						
CO11-210301	Isotope Geochemistry	Lecture	m	4	2,5						
CO11-210373	Mineral Resources	Lecture	m	4	2,5						
CO11-210202	Fieldtrip Volcanism and Hydrochemistry in the Eifel, Germany	Excursion	m	4	2,5						
CO12-EOEnvPhys	Module: Earth, Ocean, and Environmental GeoPhysics			me	15						
CO12-210223	Geophysical Techniques and Applications	Lecture	m	3	2,5						
CO12-210233	Geophysical Hydrodynamics	Lecture	m	3	2,5						
CO12-210214	Physical Oceanography	Lecture	m	3	2,5						
CO12-210224	Geophysical Data Analysis and Modeling	Lecture	m	4	2,5						
CO12-210213	Earth System Monitoring and Remote Sensing	Lecture	m	4	2,5						
CO12-210251	Oceanographic Excursion / Research Cruise North Sea	Excursion	m	4	2,5						
Year 3 - CAREER					Year 3 - CAREER						
45					5						
CA02 / CA03	Module: Internship / Study Abroad			m	5	20					
CA01-CarSkills	Module: Career Skills			m							
CA07-EES	Module: Project / Thesis EES			m	15						
CA07-210304	Project EES	m	6	5							
CA07-210305	Thesis EES	m	6	10							
CA-S-EES	Module: Specialization Area EES			m	10						
Take four specialization courses (2,5 ECTS each) ²				me	5/6	10					
Total ECTS					Total ECTS						
180					180						

¹ Status (m = mandatory, e = elective, me = mandatory elective), ² For a full listing of all CHOICE / CORE / CAREER / Jacobs Track modules please consult the CampusNet online catalogue and / or the module handbook (on our website).

³ You are required to take six Triangle Area courses in total. Select two from each of the three triangle areas (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT).

Appendix 1b - Mandatory Course Plan for Campus Track

Earth and Environmental Sciences – Campus Track					Matriculation Fall 2015						
Program-Specific Modules					Jacobs Track Modules (General Education)						
Type	Status ¹	Semester	Credits		Type	Status ¹	Semester	Credits			
Year 1 - CHOICE					Year 1 - CHOICE						
45					20						
<i>Take the two mandatory CHOICE modules listed below, these are a requirement for the EES program.</i>											
CH04-InorgChem	Module: Inorganic Chemistry and Environmental Systems			m	15	JT-ME-MethodsMath	Module: Methods / Mathematics			m	7,5
CH04-210131	Introduction to Earth and Environmental Systems A	Lecture	m	1	2,5	JT-ME-120106	Applied Calculus I	Lecture	m	1	2,5
CH04-210132	Introduction to Earth and Environmental Systems B	Lecture	m	2	2,5	JT-ME-120107	Applied Calculus II	Lecture	m	1	2,5
CH04-210111	GeoEnvironmental Systems and their Chemistry - Field Lab	Excursion	m	2	2,5	JT-ME-120101	Mathematical Concepts in the Sciences	Lecture	m	2	2,5
CH04-400108	Inorganic Chemistry I A	Lecture	m	1	2,5	JT-SK-Skills	Module: Skills			m	2,5
CH04-400109	Inorganic Chemistry I B	Lecture	m	2	2,5	JT-SK-990103	Scientific and Experimental Skills	Lecture	m	1	2,5
CH04-400111	Inorganic Chemistry I Lab	Lab	m	1	2,5	JT-TA-TriArea	Module: Triangle Area			m	5
CH05-PhysNatSys	Module: Physics of Natural Systems			m	15	Take two courses from the triangle (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT) area. Each counts 2,5 ECTS ³					
CH05-200104	Classical Physics	Lecture	m	1	5	JT-LA-Language	Module: Language			m	5
CH05-200114	Classical Physics Lab	Lab	m	1	2,5	Take two German courses (2,5 ECTS each). Native German speakers take courses in another offered language					
CH05-210132	Introduction to Earth and Marine Systems	Lecture	m	2	5						
CH05-210133	Introduction to Mineralogy	Lecture	m	2	2,5						
Module: CHOICE (own selection)				e	1/2	15					
<i>Students take one further CHOICE module from those offered for all other study programs. ²</i>											
Year 2 - CORE					Year 2 - CORE						
45					20						
<i>Take all three modules or replace one with a CORE module from a different study program. ²</i>											
CO10-FundEES	Module: Fundamental Earth and Environmental Sciences			me	15	JT-ME-MethodsMath	Module: Methods / Mathematics			m	7,5
CO10-210201	Volcanism and Metamorphism	Lecture	m	3	2,5	Take three Methods (mandatory) elective courses (2,5 ECTS each). ²					
CO10-210203	Sedimentology	Lecture	m	3	2,5	Lecture	me	3/4	7,5		
CO10-210206	Structural Geology	Lecture	m	3	2,5						
CO10-210204	Marine Environments	Lecture	m	4	2,5	JT-TA-TriArea	Module: Triangle Area			m	7,5
CO10-210205	Climate Change	Lecture	m	4	2,5	Take three courses from the triangle (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT) area. Each counts 2,5 ECTS ³					
CO10-041202	Fieldtrip Environmental Changes and Challenges in Northwestern Germany	Excursion	m	4	2,5						
CO11-EOEnvChem	Module: Earth, Ocean, and Environmental GeoChemistry			me	15	JT-LA-Language	Module: Language			m	5
CO11-210241	Geochemistry of Igneous and Aqueous Systems	Lecture	m	3	2,5	Take two German courses (2,5 ECTS each). Native German speakers take courses in another offered language					
CO11-210302	Environmental Geochemistry	Lecture	m	3	2,5						
CO11-210362	Applied Geochemistry	Lecture	m	4	2,5						
CO11-210301	Isotope Geochemistry	Lecture	m	4	2,5						
CO11-210373	Mineral Resources	Lecture	m	4	2,5						
CO11-210202	Fieldtrip Volcanism and Hydrochemistry in the Eifel, Germany	Excursion	m	4	2,5						
CO12-EOEnvPhys	Module: Earth, Ocean, and Environmental GeoPhysics			me	15						
CO12-210223	Geophysical Techniques and Applications	Lecture	m	3	2,5						
CO12-210233	Geophysical Hydrodynamics	Lecture	m	3	2,5						
CO12-210214	Physical Oceanography	Lecture	m	3	2,5						
CO12-210224	Geophysical Data Analysis and Modeling	Lecture	m	4	2,5						
CO12-210213	Earth System Monitoring and Remote Sensing	Lecture	m	4	2,5						
CO12-210251	Oceanographic Excursion / Research Cruise North Sea	Excursion	m	4	2,5						
Year 3 - CAREER					Year 3 - CAREER						
45					5						
COXX	Module: Additional (4th) CORE module			m	5/6	15					
CA01-CarSkills	Module: Career Skills			m							
CA07-EES	Module: Project / Thesis EES			m							
CA07-210304	Project EES	m	5	5	JT-SK-Skills	Module: Skills			m	2,5	
CA07-210305	Thesis EES	m	6	10	Advanced Scientific and Experimental Skills						
CA-S-EES				Module: Specialization Area EES		m				15	
Take six specialization courses (2.5 ECTS each) ²				me	5/6	15					
Total ECTS					Total ECTS						
180					180						

¹ Status (m = mandatory, e = elective, me = mandatory elective), ² For a full listing of all CHOICE / CORE / CAREER / Jacobs Track modules please consult the CampusNet online catalogue and / or the module handbook (on our website).

³ You are required to take six Triangle Area courses in total. Select two from each of the three triangle areas (BUSINESS, TECHNOLOGY & INNOVATION, SOCIETAL CONTEXT).