

**6.10.52 Implementation Regulations for the Bachelor's Programme
in Energy and Raw Materials
at the Clausthal University of Technology,
Faculty for Energy and Economics
from 21 July 2015**

In the version from the 3rd amendment from June 23, 2020

The Faculty for Energy and Economics agreed on the following implementation regulations on 21 July 2015, in accordance with § 7 para 3 in relation with § 44 para 1 of the Higher Education Act of Lower Saxony (NHG). These regulations were authorised by the chairmanship of the Clausthal University of Technology on 01 September 2015.

Last amended by the faculty board decree from 17 January 2017 and the authorisation from the chairmanship from 14 February 2017. Last amended by the faculty board decree from June 25, 2019 and the authorisation from the chairmanship from July 11, 2019. Last amended by the faculty board decree from June 23, 2020 and the authorisation from the chairmanship from July 14, 2020.

Preamble

These implementation regulations solely apply in relation with the general exam regulations (APO) of the TU Clausthal in the respectively valid version, and contain all programme-specific additions, amendments and regulations.

Objective of the Programme

The content and structure of the bachelor's programme in Energy and Raw Materials at the Clausthal University of Technology is determined by the fact that the tasks that academically educated engineers need to fulfil in science and practice are due to the complexity of engineering problems and the change in the requirements of their professional specialisation, while also demand a suitable academic degree.

The bachelor's programme in Energy and Raw Materials serves the scientific qualification requirements graduates need for their profession requiring the application of basic as well as up-to-date scientific knowledge and methods. The course content and the practical relevance will enable graduates to quickly integrate in the professional realm of an energy and raw material company and to actively participate in operational tasks.

The knowledge acquired during the programme and the key competencies of the Bachelor's degree prepare graduates for a professional career based mainly upon professional knowledge and experience up to taking on management responsibilities in the energy and raw material industry and related industries.

To achieve this goal, the following skills will be developed during the programme:

- Uptake and Processing of Knowledge
- Analytical Thinking
- Planning, Organising and Decision Making
- Argumentation and Communication
- Teamwork

The programme teaches the basic knowledge and skills of an engineer employed in the field of energy and raw material supply. A prerequisite for this is a broad-based, generalist basic knowledge in the fields of natural sciences, engineering, geoscience, law and economics as well as in the field of social competence.

On § 5 Programme-specific implementation regulations

The Bachelor's programme in Energy and Raw Materials has a modular structure. Appendix 1 (module overview) lists the credit points (CP) assigned to individual modules in accordance with ECTS (European Credit Transfer System) as well as the type and scope of academic and/or examination requirements.

The following fields of study are available, one of which must be selected:

- a. Energy and Raw Material Supply Procedure
- b. Petroleum Engineering

Annexes 2a and 2b contain a model study plan for each curriculum, showing the recommended course of study.

A detailed description of the modules and their content is provided in the separate module manual.

On § 6 Duration and structure of the programme, assessment

The programme can be started in winter or summer semester. The model study plan is set to begin in the winter semester. Beginning of the programme in the summer semester and compliance with the regular study time requires an increased study effort.

The standard period of study of the fulltime Bachelor's programme, including the Bachelor thesis, is 6 semesters. The scope of Bachelor's programme equates to a total of 180 credit points, including 12 credits for the Bachelor's thesis including colloquium.

Prior to starting the programme, students are required to take a 4-week industrial internship (pre-study internship) and to verify participation at the latest for enrolment in the Bachelor's thesis. During the programme, students are required to take a 4-week industrial internship (specialized internship).

Details are found in the general internship regulations of the Clausthal University of Tech-

nology in conjunction with the internship regulations for the Bachelor's programme in Energy and Raw Materials, as amended.

On § 10 Admission for exam

The concentration selection is binding with the first test attempt in one of the modules of the curriculum. Changing the concentration is only possible if no test attempts have been made in said module. Changing the concentration is possible only once and must be submitted in writing to the Examination Office in good time before placing the newly selected module of the other concentration.

The module selection is binding with the first test attempt in a compulsory elective module. Changing the compulsory elective module is only possible if no test attempts have been made in a compulsory elective module.

On § 13 Structure of the examinations, additional examinations and conditional examinations

According to Annex 1, the programme consists of compulsory and elective modules with module and sub-module examinations, an industrial internship as well as a Bachelor thesis according to § 16 APO.

The Faculty Council will update the elective module catalogue (Annex 1) once a year. Changes made to elective module catalogues, are published by the study centre by the end of August for the next academic year (winter/summer semester). Changes will be published in exceptional cases by the end of February for the following summer semester:

<https://www.studium.tu-clausthal.de/studienangebot/energie-und-rohstoffe/energie-und-rohstoffe-bachelor/>

The admission to module and/or sub-module examinations as well as proof of performance can stipulate unrestrictedly repeatable admission requirements (so-called preliminary examinations). Annex 1 lists all compulsory preliminary examinations (module overview).

Proof of Performance can be graded or not. Annex 1 (module overview) shows whether a proof of performance is graded or not.

On § 14 Academic and examination requirements

Annex 1 (module overview) lists the types of academic and examination requirements (Module overview). In case the examiner requires a different type of examination, then the examiner will specify and make known all possible examinations and approved aids mentioned in Annex 1 during the first lecture. For written and oral exams (see §

15 para. 3 and 4 APO), the duration of the examination is defined in the module manual.

On § 16 Final thesis

The Bachelor's thesis, including the colloquium, comprises 12 credits and is to be completed in a period of 3 months.

According to § 10 APO the Bachelor Thesis requires a separate admission. When submitting the application, the primary examiner must be indicated.

The examiner must belong to the university lecturer group of the TU Clausthal and his or her department must be listed below:

- Department of Mining
- Department of Petroleum Engineering
- Department of Geotechnical Engineering and Mining-Surveying
- Department of Processing, Landfill Technology and Geomechanics

Exceptions are granted by the Examination Board.

In addition to the admission requirements pursuant to § 10 APO, students need a total of at least 150 credit points and have completed the industrial internship to be admitted to the Bachelor Thesis. Justified exceptions are granted by the Examination Board.

Grading of the module Bachelor's Thesis is based upon 90% of the written examination and 10% of the oral examination (Colloquium).

On § 18 Examination of exam performance, grading

The weighing of the individual modules for the final grade occurs in accordance with Annex 1 (Module Overview).

On § 20 Second attempt, repeating exams

Comparable courses of studies within the meaning of § 20 (5) APO are all bachelor and diploma programmes in the fields of:

- Energy and Raw Material Supply Technology
- Mining
- Mineral Resources Engineering
- Petroleum Engineering
- Geotechnical Engineering.

On § 22
Failure, cheating, exception regulations

The Bachelor's programme of Energy and Raw Materials is not intended for part-time studies.

On § 30
Coming into effect

These implementation regulations come into effect on the day after their announcement in the official announcement paper of the Clausthal University of Technology at the beginning of the examination period of the winter semester 2015/2016.

Transitional provisions to these implementation regulations of 21 July 2015

Students who commence their studies at the TU Clausthal in the winter semester 2015/2016 will be examined in accordance with these implementation regulations.

Students who are already enrolled in the second or higher semester of this course of study when these implementation regulations take effect, may complete the Bachelor's programme by the end of the winter semester 2019/2020 in accordance with the implementation regulations of the Master's programme for Energy and Raw Materials as of 12 February 2007 in the version of 21 July 2015. Students may change to these implementation regulations. However, the application must be submitted to the Examination Office at the latest before the application for admission to the thesis.

Any hardships arising from a change may be compensated by the Head of the Examination Board on a case-by-case basis.

Transitional provisions to the 1st Amendment of 17.01.2017

(1) Students, who commence their studies at the TU Clausthal this summer semester 2017 will be examined in accordance with this version of the implementation regulations.

(2) Students who have been enrolled in this programme at the TU Clausthal before the Summer Semester 2017 will be transferred into this version of the implementation regulations. The following provisional regulations apply to them:

Students who have already successfully passed the previous valid modules will keep the credits for these modules.

Students who have already passed the Module 26 "Deep Drilling Technology" within the scope of their free attempt will be given the opportunity to better their grades according to § 20 para. 1 APO after consulting the Faculty of Energy and Economics. Students can only register for the module examination within the scope of their free attempt to improve grades by submitting the Application For Admission to Examinations at the Examination Office.

Failed examination attempts for the replaced module examination in module 26 "Deep Drilling Technique" will not be included in the new sub-module examination according to this version of the implementation regulations.

(3) Any hardships arising from a change to the present implementation regulations may be compensated by the Head of the Examination Board on a case-by-case basis.

Transitional regulations of the 2nd amendment issued on June 25, 2019

(1) Students who are enrolled in this study programme when these amendments come into force will be transferred to this version of the Implementation Regulations. The following transitional regulations apply to them:

- Students who have already successfully completed the modules or module examinations previously in force will continue to receive credits for these modules or module examinations.
- Students who have already passed the previous module examinations as part of the free trial will be given a one-off opportunity to improve their grades in the winter semester 2019/2020 in accordance with § 20 Para. 1 APO. Applications for the module examination as part of the free attempt to improve grades can only be submitted to the Examination Office using the form (Application for Admission to Exams).
- Any failed attempts of the replaced module examination "Petroleum Engineering" will not be credited to the new module partial examinations "Petroleum Engineering Systems" and "Petroleum Engineering" according to this version of the Implementation Regulations.

(2) Any hardships resulting from these changes may be compensated by the examination board on application by way of individual case decisions.

Transitional regulations to the 3rd amendment of 23.06.2020 ³⁾

(1) Students who begin their studies in this study programme from winter semester 2020/2021 or later will be examined in accordance with this version of the Implementation Rules.

(2) Students who were already enrolled in this programme before the winter semester 2020/2021 in accordance with the Implementation Rules of 21.07.2015 in the version of the 2 Amendment of 25.06.2019 at Clausthal University of Technology will be transferred to this version of the Implementation Rules. The following transitional regulations will apply for them:

- Students who have already successfully completed the compulsory module "Module 21: Surveying" with the module examination will continue to receive credits for this module.

³⁾ 3rd amendment of the Implementation Rules of 23.06.2020

- Students who have passed the previous module examination in the compulsory module "Module 21: Students who have already passed the previous module examination in the compulsory module "Module 21 Surveying" within the framework of the free trial, will be given the opportunity to take an examination to improve their grades in accordance with § 20 (1) of the General Examination Regulations (APO) by the summer semester 2021 after consultation with the Faculty of Energy and Economics. Applications for the module examination within the course of the free trial for grade improvement can only be submitted to the Examination Office using the official application form (Application for Admission to Examinations).
- Any failed attempts of the replaced module examination in the compulsory module "Module 21: Surveying" will not be credited to the new module partial examinations according to this version of the Implementation Rules.

Annex 1: Module Overview

Annex 2a: Sample Curriculum Energy and Raw Materials Supply Engineering

Annex 2b: Sample Curriculum Petroleum Engineering

Annex 1:

Sample Curriculum for the Bachelor's Programme in Energy and Raw Materials

The weighting factors of each module for the calculation of the final grade is given in the tables below. In each case, the module weighting factor X is divided by the sum of all module weighting factors Σ . Modules for which a proof of successful participation is sufficient are not considered.

Compulsory modules of both concentrations

Common compulsory modules of both concentrations							
All modules listed below must be passed with a total of 124 credit points.							
Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded ?	Exam type
Module 1: Engineering Mathematics I			8		8/Σ		
Engineering Mathematics I	W 0110	4V+2Ü	8	K od. M	1,0000	ben.	MP
Homework assignment for Engineering Mathematics I		Ü	0	HA	0,0000	un-ben.	PV
Module 2: Engineering Mathematics II			8		8/Σ		
Engineering Mathematics II	S 0110	4V+2Ü	8	K od. M	1,0000	ben.	MP
Homework assignment for Engineering Mathematics II		Ü	0	HA	0,0000	un-ben.	PV
Module 3: Experimental Physics I			6		6/Σ		
Experimental Physics I	W 2101	3V	6	K od. M	1,0000	ben.	MP
Exercises for Experimental Physics I	W 2103	1 Ü					
Module 4: Experimental Physics II			6		6/Σ		
Experimental Physics k II	S 2101	3V	6	K od. M	1,0000	ben.	MP
Exercises for Experimental Physics II	S 2103	1 Ü					
Module 5: Technical Mechanics I			6		6/Σ		
Technical Mechanics I	W 8001	3V+2Ü	6	K od. M	1,0000	ben.	MP
Module 6: Technical Mechanics II			6		6/Σ		
Technical Mechanics II	S 8002	3V+2Ü	6	K od. M	1,0000	ben.	MP
Module 7: Introduction to Chemistry			7		7/Σ		
Introduction to Organic Chemistry	S 3101	2V/Ü	3	K od. M	0,5000	ben.	MTP
Introduction to General and Inorganic Chemistry I	W 3080	3V/Ü	4	K od. M	0,5000	ben.	MTP
Module 8: Introduction to Geosciences I			7		7/Σ		
Introduction to Geosciences I (incl. Geological Exercises I)	W 4001	4V+2Ü	7	K od. M	1,0000	ben.	MP

Module 9: Introduction to Geosciences II			7		7/Σ		
Introduction to Geosciences II (incl. Geological Exercises II)	S 4001	4V+2Ü	7	K od. M	1,0000	ben.	MP
Module 10: Electrical engineering for engineers			10		10/Σ		
Electrical engineering for engineers I	W 8810	2V	3	K od. M	1,0000	ben.	MP
Electrical engineering for engineers II	S 8813	2V	3			ben.	
Practicum for the basics of electrical engineering I	W 8850	1P	2	PrA	0,0000	un-ben.	LN
Practicum for the basics of electrical engineering II	S 8851	1P	2	PrA	0,0000	un-ben.	LN
Module 11: Mechanical Engineering			11		11/Σ		
Mechanical Engineering I	W 8107	3V	4	K od. M	0,5000	ben.	MTP
Mechanical Engineering II	S 8307	3V	4	K od. M	0,5000	ben.	MTP
Machine Drawing / CAD	S 8103	2Ü	3	PrA	0,0000	ben.	LN
Module 12: Data Processing			6		6/Σ		
Data processing for engineers	S 8730	2V/Ü	2	K od. M	1,0000	ben.	MP
Introduction to programming (for engineers)	W 8733	2V/Ü	2				
Engineering software tools	S 8734	1Ü	2				
Module 13: Basics of Business Administration			6		6/Σ		
Introduction to business administration for engineers and scientists	W 6601	2V	3	K od. M	1,0000	ben.	MP
Introduction to cost and profitability analysis	S 6601	2V	3				
Module 14: Basics of law			6		6/Σ		
Introduction to law I (Civil Law)	W 6503	2V	3	K od. M	1,0000	ben.	MP
Introduction to law II (Public law)	S 6502	2V	3				
Module 15: Mining and Environmental Law			6		6/Σ		
Mining and Environmental Law I (Mining law)	W 6501	2V	3	K od. M	1,0000	ben.	MP
Mining and Environmental Law II (Environmental Law)	S 6500	2V	3				
Module 30: Industrial Placement			6		0		
Industrial Placement (4 weeks) + report		4 Wo.	6	IP	0,0000	un-ben.	LN
Module 31: Thesis			12		12/Σ		
Bachelor Thesis + Colloquium		3 Mo	12	AB	1,0000	ben.	MP

Elective module selection „Key Qualification“ of both concentrations

- Students must select modules/courses worth **2** credit points from the compulsory elective module catalogue "Key Qualifications" and pass them all. Further examinations can only be carried out as additional examinations.
- The module selection is binding with the first test attempt in a compulsory elective module. Changing the compulsory elective module is only possible if no test attempts have been made in a compulsory elective module.
- The Faculty Council will update the list of offered modules for the next academy year once a year. The Study Centre will publicly announce the updated lists:
<https://www.studium.tu-clausthal.de/studienangebot/energie-und-rohstoffe/energie-und-rohstoffe-bachelor/>

Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded ?	Exam type
Module: Intercultural Communication			2		0		
Intercultural Communication	S 9220	2S	2	ThA	0,0000	un-ben.	LN
Module: Primecup Germany			2		0		
Primecup Germany	S 6699	2S	2	PrA	0,0000	un-ben.	LN
Module: Lecture startup and company management			2		0		
Lecture startup and company management	W 9600	2V	2	ThA	0,0000	un-ben.	LN
Module: Social Competence I (Basics of communication)			2		0		
Social Competence I (Basics of communication)	W 9003	1V+1Ü	2	ThA	0,0000	un-ben.	LN
Module: Social Competence II (Basics of operational Communications)			2		0		
Social Competence II (Basics of operational Communications)	S 9006	1V+1Ü	2	ThA	0,0000	un-ben.	LN

Field of study

Concentration Energy and Raw Material Supply Technology							
<ul style="list-style-type: none"> Students need to choose one concentration. The concentration selection is binding with the first test attempt in one of the modules of the curriculum. Changing the concentration is only possible if no test attempts have been made in said module. Changing the concentration is possible only once and must be submitted in writing to the Examination Office in good time before placing the newly selected module of the other concentration. 							
Compulsory modules Energy and raw material supply technology							
All modules listed below must be passed with a total of 45 credit points.							
Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded ?	Exam type
Module 16: Introduction to Raw Material Extraction			2		0		
Introduction to Raw Material Extraction	S 6015	1V	1	Ex	0,0000	un-ben.	LN
Introduction to Raw Material Extraction / Excursion	W 6015	1Ü	1				
Module 17: Raw Material Supply I (Surface mining)			6		6/Σ		
Opencast Mining	W 6606	2V	3	K od. M	1,0000	ben.	MP
Dimensioning and scheduling of Construction and Opencast Mining Machines	S 6065	2V	3				
Module 18: Raw Material Supply II (Underground mining)			6		6/Σ		
Underground Mining I	W 6042	2V	3	K od. M	1,0000	ben.	MP
Underground Mining II	S 6032	2V	3				
Module 19: Raw Material Supply III (Underground mining)			8		8/Σ		
Conveyor Technology I incl. exercise	W 6030	2V+1Ü	4	K od. M	0,5000	ben.	MTP
Weather engineering and air conditioning I incl. exercise	W 6033	2V+1Ü	4	K od. M	0,5000	ben.	MTP
Module 20: Raw Material Processing			6		6/Σ		
Processing I	W 6200	2V	3	K od. M	1,0000	ben.	MP
Processing II	S 6210	2V	3				
Modul 21: Sensor Systems and Point Determination in Geomatics³⁾			6		6/Σ		
Geo Sensor Systems	W 6301	2V	3	K od. M	0,5000	ben.	MTP
Terrestrial Point Determination	S 6302	1V+1Ü	3	K od. M	0,5000	ben.	MTP
Module 22: Rock and Soil Mechanics			6		6/Σ		
Soil mechanics - analysis / Geomechanics I	W 6230	2V	3	K od. M	1,0000	ben.	MP

³⁾ 3rd amendment of the Implementation Rules of 23.06.2020

Rock Mechanics / Geomechanics II	S 6231	2V	3				
Module 29: Seminar			5		5/Σ		
Seminar for Energy and Raw Materials Supply Engineering I	W 6076	2S	5	SL	1,0000	ben.	MP

Elective module selection " Energy and raw material supply technology "

- Students must select modules worth **9 CP** plus max. 3 CP from the compulsory elective module catalogue "Energy and raw material supply technology" and pass them all. Further examinations can only be carried out as additional examinations.
- The module selection is binding with the first test attempt in a compulsory elective module. Changing the compulsory elective module is only possible if no test attempts have been made in a compulsory elective module.
- The Faculty Council will update the list of offered modules for the next academy year once a year. The Study Centre will publicly announce the updated lists:
<https://www.studium.tu-clausthal.de/studienangebot/energie-und-rohstoffe/energie-und-rohstoffe-bachelor/>

Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded ?	Exam type
Module ERST 1: Basics of Binders and Building Materials			3		3/Σ		
Basics of Binders and Building Materials	W 7815	2V/Ü	3	K od. M	1,0000	ben.	MP
Module ERST 2: Planning and Construction of Caverns			3		3/Σ		
Planning and Construction of Caverns	W 6259	2V	3	K od. M	1,0000	ben.	MP
Module ERST 3: Engineering Geology			3		3/Σ		
Engineering Geology	W 6361	2V	3	K od. M	1,0000	ben.	MP
Module ERST 4: Introduction to Applied Geophysics / Geophysical Exploration			3		3/Σ		
Introduction to Applied Geophysics / Geophysical Exploration	W 4040	2V/Ü	3	K od. M	1,0000	ben.	MP
Module ERST 5: Work safety, environmental and health protection			3		3/Σ		
Work safety, environmental and health protection	S 6069	2V	3	K od. M	1,0000	ben.	MP
Module ERST 6: Special Drilling Technology			3		3/Σ		
Special Drilling Technology	S 6040	2V/Ü	3	K od. M	1,0000	ben.	MP
Module ERST 7: Recycling I			3		3/Σ		
Recycling I	W 6205	2V	3	K od. M	1,0000	ben.	MP
Module ERST 8: Sewage technology I			3		3/Σ		
Sewage technology I	W 6204	2V	3	K od. M	1,0000	ben.	MP
Module ERST 9: Basics of soil treatment			4		4/Σ		
Basics of soil treatment	W 6224	3V	4	K od. M	1,0000	ben.	MP

Module ERST 10: Chemical thermodynamics			4		4/Σ		
Chemical thermodynamics	S 8411	2V+1Ü	4	K od. M	1,0000	ben.	MP
Module ERST 11: Technical Thermodynamics I			4		4/Σ		
Technical Thermodynamics I	W 8500	2V+1Ü	4	K od. M	1,0000	ben.	MP
Module ERST 12: Control Engineering I			4		4/Σ		
Control Engineering I	S 8904	2V+1Ü	4	K od. M	1,0000	ben.	MP
Module ERST 13: Energy systems			4		4/Σ		
Energy systems	W 8804	3V	4	K od. M	1,0000	ben.	MP
Module ERST 14: Production and Sales			6		6/Σ		
Marketing	W 6620	2V	3	K od. M	1,0000	ben.	MP
Production	S 6651	2V	3				
Module ERST 15: English Language Competence			6		6/Σ		
Technical English	W 9000	2V+2Ü	4	K od. M	0,666	ben.	MTP
English for International Commerce	S 9093	2V/Ü	2	K od. M	0,333	ben.	MTP

Concentration Petroleum Engineering

- Students need to choose one concentration.
- The concentration selection is binding with the first test attempt in one of the modules of the curriculum. Changing the concentration is only possible if no test attempts have been made in said module. Changing the concentration is possible only once and must be submitted in writing to the Examination Office in good time before placing the newly selected module of the other concentration.

Compulsory modules Petroleum Engineering

All modules listed below must be passed with a total of **43** credit points.

Course	Course No	Course type, SWS	CP	Exam form	Gewichtung	Graded ?	Exam type
Module 23: Geoscience Basis of Petroleum Engineering			7		7/Σ		
Basics of oil, natural gas geology	S 2014	2V+1Ü	4	K od. M	0,5714	ben.	MTP
Introduction to Applied Geophysics / Geophysical Exploration	W 4040	2V	3	K od. M	0,4286	ben.	MTP
Module 24: Basics of Petroleum Engineering			11		11/Σ		
Basics of Drilling Technology	S 6141	2V+1Ü	4	K od. M	0,3636	ben.	MTP
Basics of Natural Gas Transport and Distribution	S 6140	2V	3	K od. M	0,2727	ben.	MTP
Deposit Technology I	S 6155	2V+1Ü	4	K od. M	0,3636	ben.	MTP
Module 25: Oil / Natural Gas Deposit Technology			7		7/Σ		
Deposit Technology II	W 6157 ¹⁾	2V+3P	7	K od. M	1,0000	ben.	MP
Module 26:¹⁾ Deep Drilling Technology			6		6/Σ		
Rinsing / Cementing and Raking Practicum	W 6144	2P	3	PrA	0,5000	ben.	MTP
Drilling & Workover Systems and Equipment	W 6143	2V	3	K od. M	0,5000	ben.	MTP
Module 27: Petroleum Engineering			7		7/Σ		
Petroleum Engineering Systems	W 6146	2V	3	K od. M ²	0,4286	ben.	MTP
Petroleum Engineering	W 6163	2V+1Ü	4	K od. M	0,5714	ben.	MTP
Module 28: Seminar			5		5/Σ		
Seminar		2S	5	SL	1,0000	ben.	MP

¹⁾ 1st Amendment of the implementation regulations of 17 January 2017

²⁾ 2nd Amendment of the implementation regulations of June 25, 2019

Elective module selection "Petroleum Engineering I" PE 1

- Students must select modules worth **8 CP** and pass them all. Further examinations can only be carried out as additional examinations.
- The module selection is binding with the first test attempt in a compulsory elective module. Changing the compulsory elective module is only possible if no test attempts have been made in a compulsory elective module.
- The Faculty Council will update the list of offered modules for the next academy year once a year. The Study Centre will publicly announce the updated lists:
<https://www.studium.tu-clausthal.de/studienangebot/energie-und-rohstoffe/energie-und-rohstoffe-bachelor/>

Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded?	Exam type
Module PE 1.1: Well Testing			4		4/Σ		
Basics of well testing	W 6145	2V+1Ü	4	K od. M	1,0000	ben.	MP
Module PE 1.2: Fluid Mechanics I			4		4/Σ		
Fluid Mechanics I	S 8007	2V+1Ü	4	K od. M	1,0000	ben.	MP
Module PE 1.3: Technical Thermodynamics I			4		4/Σ		
Technical Thermodynamics I	W 8500	2V+1Ü	4	K od. M	1,0000	ben.	MP

Elective module selection I "Petroleum Engineering II" PE 2

- Students must select modules worth **3CP** and pass them all. Further examinations can only be carried out as additional examinations.
- The module selection is binding with the first test attempt in a compulsory elective module. Changing the compulsory elective module is only possible if no test attempts have been made in a compulsory elective module.
- The Faculty Council will update the list of offered modules for the next academy year once a year. The Study Centre will publicly announce the updated lists:
<https://www.studium.tu-clausthal.de/studienangebot/energie-und-rohstoffe/energie-und-rohstoffe-bachelor/>

Course	Course No	Course type, SWS	CP	Exam form	Weight	Graded?	Exam type
Module PE 2.1: Rock Mechanics / Geomechanics II			3		3/Σ		
Rock Mechanics / Geomechanics II	S 6231	2V	3	K od. M	1,0000	ben.	MP
Module PE 2.2: Work safety, environmental and health protection			3		3/Σ		
Work safety, environmental and health protection	S 6069	2V	3	K od. M	1,0000	ben.	MP

Explanation:

(1) Type of course:	E	Excursion [<i>Exkursion</i>]
	P	Practical training [<i>Praktikum</i>]
	S	Seminar [<i>Seminar</i>]
	T	Tutorium [<i>Tutorium</i>]
	V	Lecture [<i>Vorlesung</i>]
	Ü	Excercise [<i>Übung</i>]
(2) Form of examination:	K	Written examination [<i>Klausur</i>]
	M	Oral examination [<i>Mündliche Prüfung</i>]
	SL	Seminar performance [<i>Seminarleistung</i>]
	PrA	Practical work [<i>Praktische Arbeit</i>]
	ThA	Theoretical work [<i>Theoretische Arbeit</i>]
	SA	Student research project [<i>Studienarbeit</i>]
	PA	Project work [<i>Projekt Arbeit</i>]
	IP	Internship [<i>Industriepraktikum</i>]
	HA	Homework [<i>Hausarbeit</i>]
	Ex	Excursions [<i>Exkursion</i>]
	Ab	Final Thesis [<i>Abschlussarbeit</i>]
(3) Type of examination:	LN	Certificate of performance [<i>Leistungsnachweis</i>]
	MP	Module-related examination [<i>Modulprüfung</i>]
	MTP	Partial module-related examination [<i>Modulteilprüfung</i>]
	PV	Preparatory assessment [<i>Prüfungsvorleistung</i>]
(4) Other abbreviations	ben.	Evaluated performance [<i>benotete Leistung</i>]
	unben.	Performance without evaluation [<i>unbenotete Leistung</i>]
	od.	or [<i>oder</i>]
	LV	Course [<i>Lehrveranstaltung</i>]
	Prüf.	Examination [<i>Prüfung</i>]
	LP	Credits [<i>Leistungspunkte</i>]
	SWS	Number of hours per week [<i>Semesterwochenstunden</i>]

Annex 2a: Model Study Programme - Study Field : Energy and Raw Materials Supply Engineering *new starting in WS 15/16*

SWS	1. Sem	2. Sem	3. Sem	4. Sem	5. Sem	6. Sem		
1	Engineering Mathematics I 8 LP	Engineering Mathematics II 8 LP	Electrical engineering for engineers I 3 LP	Electrical engineering for engineers II 3 LP	Introduction to business administration for engineers and scientists 3 LP	Introduction to cost and profitability analysis 3 LP		
2			Practicum for electrical engineering I 2 LP	Practicum for electrical engineering II 2 LP	Soil mechanics - analysis / Geomechanics I 3 LP	Rock Mechanics / Geomechanics II 3 LP		
3			Mechanical Engineering I 4 LP	Mechanical Engineering II 4 LP				
4			Machine Drawing/CAD 3 LP	Underground Mining II 3 LP	Weather engineering and air conditioning I incl. exercise 4 LP	Elective Module 3 LP		
5							Underground Mining I 3 LP	Mining and Environmental Law I (Mining law) 3 LP
6								
7	Conveyor Technology I 4 LP	Data processing for engineers 3 LP	Engineering software tools 2 LP	Bachelor Thesis + Colloquium 12 LP				
8					Dimensioning and scheduling of Construction and Open-cast Mining Machines 3 LP	Elective Module 6 LP		
9							Terrestrial Point Determination 3 LP	
10	Geo Sensor Systems 3 LP	Processing II 3 LP	Key Qualification 2 LP					
11					Processing I 3 LP	Introduction to law II (Public law) 3 LP	Seminar 5 LP	
12	Introduction to law I (Civil Law) 3 LP							
13		Introduction to Geosciences II (incl. Geological Exercises II) 7 LP						
14	Introduction to Raw Material Extraction / Excursion 1 LP							
15								
16	Introduction to General and Inorganic Chemistry I 4 LP	Introduction to Organic Chemistry 3 LP						
17								
18	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences II (incl. Geological Exercises II) 7 LP						
19								
20								
21								
22	Introduction to Raw Material Extraction 1 LP							
23								
24								
25								
26								
∑ SWS	25	24	21	20	19	14		
∑ LP	32	31	31	29	31	21		
	Industrial Placement (4 weeks) + report / 6 LP							

Annex 2b: Model Study Programme - Study Field: Petroleum Engineering
New starting in WS 15/16

SWS	1. Sem	2. Sem	3. Sem	4. Sem	5. Sem	6. Sem		
1	Engineering Mathematics I 8 LP	Engineering Mathematics II 8 LP	Electrical engineering for engineers I 3 LP	Electrical engineering for engineers II 3 LP	Key Qualification 2 LP	Seminar 5 LP		
2			Practicum for electrical engineering I 2 LP	Practicum for electrical engineering II 2 LP			Mining and Environmental Law II (Environmental Law) 3 LP	Mining and Environmental Law I (Mining law) 3 LP
3			Mechanical Engineering I 4 LP	Data processing for engineers 3 LP	Introduction to programming 3 LP	Elective Module PE 2 3 LP		
4								
5				Introduction to law I (Civil Law) 3 LP	Petroleum Engineering Systems 3 LP			
6			Introduction to law I (Civil Law) 3 LP			Petroleum Engineering 4 LP	Bachelor Thesis + Colloquium 12 LP	
7	Introduction to business administration for engineers and scientists 3 LP	Introduction to cost and profitability analysis 3 LP						
8			Basics of oil, natural gas geology 4 LP	Basics of Drilling Technology 4 LP	Rinsing / Cementing and Raking Practicum 3 LP			
9	Introduction to Applied Geophysics / Geophysical Exploration 3LP	Basics of Natural Gas Transport and Distribution 3 LP				Drilling & Workover Systems and Equipment 3 LP		
10			Deposit Technology I 4 LP	Deposit Technology II 7 LP				
11	Elective Module PE 1 4 LP	Elective Module PE 1 4 LP						
12			Technical Mechanics I 6 LP	Technical Mechanics II 6 LP	Introduction to Organic Chemistry 3 LP	Introduction to Geosciences II (incl. Geological Exercises II) 7 LP		
13	Introduction to General and Inorganic Chemistry I 4 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
14			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
15	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
16			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
17	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
18			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
19	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
20			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
21	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
22			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
23	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP						
24			Introduction to Geosciences I (incl. Geological Exercises I) 7 LP	Introduction to Geosciences I (incl. Geological Exercises I) 7 LP				
∑ SWS	24	23			17	23	23	14
∑ LP	31	30	25	33	32	23		
Industrial Placement (4 weeks) + report / 6 LP								