

Regulatory Statutes

for the General Study Regulations (APB) of the TUD in the version dated
April 1, 2003
for the International Master of Science Post-Graduate Course in
"Tropical Hydrogeology, Engineering Geology and Environmental Management
(TropHEE)"

Referral to § 2:

The Darmstadt University of Technology shall grant the academic degree Master of Science for the study course "Tropical Hydrogeology, Engineering Geology and Environmental Management (TropHEE)", upon passing the examinations successfully.

Referral to § 3 (4):

The prescribed time period for completing the course including the Master thesis is 4 semesters. The examinations complement the studies.

Referral to § 5 (3):

The appropriate number of credits shall be awarded for each passed course examination.

Referral to § 7:

The Examination Board comprises three professors participating in the degree program, a scientific employee involved in the course as well as a current student of the degree course.

Referral to § 17 (3):

Applicants for this degree course must be specially qualified. Applicants are required to hold a Bachelor of Science or Bachelor of Engineering university degree in geological science, civil engineering or a related subject. In addition to this, applicants are required to pass an entrance examination covering the contents of the preparatory distance course and must have proof of English language proficiency in form of a Unicert III certificate or an equivalent qualification.

Referral to § 20 (1):

The preparatory course (distance course) ensures that all participants have the same level of knowledge of the basic subjects and comprises the following topics:

- Basic geology
- Basic hydrogeology and hydrochemistry
- Basic engineering geology
- Basic soil science
- Basic environmental management

These topics will be assessed in an entrance examination, which will be graded on a pass/fail basis.

The attendance of the preparatory course is voluntary, but the passing of the distance test is mandatory for the enrolment. These steps do not require prior matriculation.

The following table lists the courses of the degree program, arranged in modules. The courses are divided into assessed courses (P) and study courses (SL, not graded) as well as semester courses (S) and block courses (B).

Modul / course	Type	CPs	P/SL	S/B
CM Core Modules		40		
CM1. Geological and mineralogical methods		10		
Geological structures and mapping	F	6	P	B
Mineralogical laboratory techniques	E	4	P	B
CM2. Hydrogeology		10		
Quantitative methods in hydrogeology	L, E	3,5	P	S
Groundwater chemistry and salinization	L, E	3,5	P	S
Groundwater in tropical and subtropical areas (humid to arid zones)	L	3	P	B
CM3. Georesources and geohazards		10		
Georesources and geohazards	L	3	P	S
Raw materials	L	1,5	P	S
Spatial analysis and thematic mapping with GIS	L, E	5,5	P	S
CM4. Engineering geology		10		
Mechanical properties of rock and soil	L	3,5	P	S
Stability of slopes and dams	L	3	P	S
Geostatistics	L, E	3,5	P	S
SM Special Modules		63		
SM1. Soil protection and groundwater quality		10		
<i>Ecology of tropical and subtropical soils</i>	L	1,5	P	B
<i>Soil protection and soil erosion</i>	L, E	3,5	P	S
<i>Groundwater vulnerability and water directives</i>	L	1,5	P	S
<i>Water analysis</i>	L, E	3,5	P	B
SM2. Hydraulic engineering		9		
<i>Design and construction of wells and water plants</i>	L, E	3,5	P	B
<i>Integrated water resource management</i>	L, E	4	P	S
<i>Water supply in urban and rural areas</i>	L	1,5	P	B
SM3. Environmental engineering		10		
<i>Remediation techniques</i>	L, E	3	P	B
<i>Engineering geology of waste deposits</i>	L, E	1,5	P	B
<i>Applied clay mineralogy</i>	L, E	2	P	S
<i>Geophysics in hydrogeology and engineering geology</i>	L, E	3,5	P	B
SM4. Tools for environmental planning		9		
<i>Remote sensing in geology</i>	L, E	3,5	P	B
<i>Spatial and environmental planning in geosciences</i>	L, E	3,5	P	S
<i>Introduction to surveying</i>	L, E	2	P	S
SM5. Groundwater flow and management		10		
<i>Modelling of groundwater flow and transport</i>	L, E	5	P	S
<i>Isotope hydrology and dating</i>	L	1,5	P	B
<i>Tracer techniques</i>	L, E	3,5	P	B
SM6. Scientific and political project management		7		
Seminar	S	2	P	S
<i>Project management, technical reports, tenders</i>	L, E	3,5	P	S
<i>Economic aspects of environmental politics</i>	L	1,5	P	B
SM7. Excursions		8		
<i>Industrial excursion Germany</i>	F	3	SL	B
<i>Applied geosciences of semiarid regions</i>	F	5	SL	B
Scientific training		16		
Practical work with report		16	SL	B
Master-Thesis		30		
Total CPs offered		149		
Total CPs necessary to pass		120		

Type: L = lecture; E = exercise; F = field trip/exercise; S = seminar; CP= Credit Points; examination (P), no examination, participation required only (SL); time period: semester (S), block (B), *italic = optional*

As a rule, the examinations will take place at the end of the course. The appropriate credits will be awarded after successfully passing the course examination or completing the study courses.

Referral to § 21:

The examiner is usually the professor, assistant professor or the tutor (in compliance with § 23 (3) HHG) involved in teaching the appropriate course. In cases where this person is prevented from this duty, the head of the Examination Board shall appoint a professor or a tutor teaching in the degree course TropHEE as an examiner.

Referral to § 22:

As a rule, all examinations shall be in written form and in English. At the beginning of each course the university tutor shall inform the students if he/she will carry out an oral examination. Upon request, oral examinations can be carried out in German language.

The duration of the examination shall depend on the scope of the subject to be assessed. In the case of oral examinations, a 15 minute assessment corresponds to one credit. In written examinations approximately 30 minutes correspond to one credit.

The assistant observer in oral examinations must have successfully passed the diploma examination in Applied Geoscience, Geology-Palaeontology or any other comparable examination.

Referral to § 23 (3):

The topic of the Scientific training will usually be defined by the tutor in response to a suggestion by the candidate. The topic is issued by the chairperson of the Examination Board.

The chairperson of the Examination Board can only issue a topic after the required 90 credits (including all credits awarded for the core modules, excursions, the seminar and the scientific training (report)) have been obtained. The topic and the date of issue shall be recorded.

The Master Thesis shall be written in English. Exceptions must be approved by the Examination Board.

Referral to § 23 (5):

The preparation time for the Master Thesis is 6 months. In plausible exceptions, candidates may file an application for an extension of no more than 4 weeks.

Extensions are subject to approval by the Examination Board. Work on the Master Thesis may be interrupted, for example, to take part in block courses.

When approached by application, the chairperson of the Examination Board makes sure that the candidate is assigned a topic for the Master Thesis in a timely manner.

Referral to § 25 (2):

In modules that consist of several auxiliary examinations, the module grade is calculated from the grades of the individual examinations weighted according to the number of credits awarded for the appropriate courses.

Referral to § 27 (3):

The candidate must acquire at least 120 credits to pass the M.Sc. examination, including 40 credits for the core modules, 16 credits for the scientific training, at least 3 credits for excursions, 2 credits for the seminar and 30 credits awarded for the

Master Thesis. The student must have achieved at least a "pass" in the assessment of the Master Thesis.

Referral to § 28:

A special module has been passed successfully if the weighted mean grade is at least 4.0 (pass).

Referral to § 29 (1):

The final grade is calculated from the individual module grades weighted with the awarded credits (except for excursions and the seminar), the grade obtained for the scientific training (report, is worth 16 credits) and the grade achieved for the Master Thesis which is worth 30 credits.

Referral to §31:

A second repeat examination is permitted in 6 course examinations.

Referral to § 34

The University record also includes the grades achieved in the modules and the Master Thesis. A Diploma Supplement which will be issued according to the international regulations will be part of the University record.

Darmstadt,

Dean of the Faculty for Materials- and Geosciences
Technical University of Darmstadt

Master Course TropHEE

Tropical Hydrogeology, Engineering Geology, Environmental Management

TU Darmstadt, Applied Geosciences, Department of Materials and Earth Sciences

Selection of special modules allow for specialisation in

- Hydrogeology
- Engineering geology
- Environmental management

General syllabus:

1st Semester (= 21.5 CP obl. + 19 CP opt.)

Core modules 1, 2, 3	Special modules 1, 2
Presentation of the course and the institute, multicultural training (1 week)	
Introductory block courses (October, 2 weeks) = 10 CP obl.	
CM 1: Geological structures and mapping (6 CP) CM 1: Mineralogical laboratory techniques (4 CP)	
Regular courses (November – February, 14 weeks) = 8.5 CP obl. + 14 CP opt.	
CM 2: Quantitative methods in hydrogeology (3.5 CP) CM 2: Groundwater chemistry and salinization (3.5 CP) CM 3: Raw materials (1.5 CP)	<i>SM 1: Soil protection and soil erosion (3.5 CP)</i> <i>SM 1: Ecology of tropical and subtropical soils (1.5 CP)</i> <i>SM 1: Groundwater vulnerability and water directives (1.5 CP)</i> <i>SM 1: Water analysis (3.5 CP)</i> <i>SM 2: Integrated water resource management (4 CP)</i>
Block courses (February, 2 weeks) = 3 CP obl. + 5 CP opt.	
CM 2: Groundwater in tropical and subtropical areas (3 CP)	<i>SM 2: Design and construction of wells and water plants (3.5 CP)</i> <i>SM 2: Water supply in urban and rural areas (1.5 CP)</i>

2nd Semester (= 18.5 CP obl. + 25 opt.)

Core modules 3, 4	Special modules 3, 4, 5, 7
<p><i>SM 7: Excursion to an semiarid region (March – April, 2 weeks) = 5 opt. CP</i></p> <p>Regular courses and block courses (April – July, 12 weeks) = 18.5 CP obl. + 10 CP opt.</p>	
CM 3: Georesources and geohazards (3 CP) CM 3: Spatial analysis and thematic mapping with GIS (5.5 CP) CM 4: Mechanical properties of rock and soil (3.5 CP) CM 4: Stability of slopes and dams (3 CP) CM 4: Geostatistics (3.5 CP)	SM 3: Remediation techniques (3 CP) SM 4: Spatial and environmental planning in geosciences (3.5 CP) SM 4: Remote sensing in geology (3.5 CP)
<p><i>Block course (July, 1 week) = 10 CP opt.</i></p>	
	SM 3: Geophysics in hydrogeology and engineering geology (3.5 CP) SM 5: Isotope hydrology and dating (1.5 CP) SM 5: Modelling of groundwater flow and transport (5 CP)

3rd Semester (= 18 CP obl. + 17 CP opt.)

Core modules	Special modules 3, 4, 5, 6, 7
<p><i>SM 7: Industrial excursion Germany (October, 1 week) = 3 CP opt.</i></p> <p>Block courses (October to December; 8 weeks) = 2 CP obl. + 14 CP opt.</p>	
	SM 3: Engineering geology of waste deposits (1.5 CP) SM 3: Applied clay mineralogy (2 CP) SM 4: Introduction to surveying (2 CP) SM 5: Tracer techniques (3.5 CP) SM 6: Project management, technical reports, tenders (3.5 CP) SM 6: Economic aspects of environmental politics (1.5 CP) SM 6: Seminar (2 CP)
<p>Scientific training with report (January – March; 8 weeks) = 16 CP obl.</p>	

4th Semester (= 30 CP obl.)

<p>Master thesis (April to September; 6 months) = 30 CP</p>

obl. = obligatory

opt. = optional

TropHEE with specialisation in Hydrogeology

Programme (120 CP):

Core modules (40 CP)

Special modules No. 2, 5, 6 and 7 (34 CP)

Scientific training (16 CP)

Master Thesis (30 CP)

Syllabus:**1st Semester (= 30.5 CP)**

Core modules 1, 2, 3	Special module 2
Presentation of the course and the institute, multicultural training (1 week)	
Introductory block courses (October, 2 weeks) = 10 CP	
CM 1: Geological structures and mapping (6 CP) CM 1: Mineralogical laboratory techniques (4 CP)	
Regular courses (November – February, 14 weeks) = 12.5 CP	
CM 2: Quantitative methods in hydrogeology (3.5 CP) CM 2: Groundwater chemistry and salinization (3.5 CP) CM 3: Raw materials (1.5 CP)	<i>SM 2: Integrated water resource management (4 CP)</i>
Block courses (February, 2 weeks) = 8 CP	
CM 2: Groundwater in tropical and sub-tropical areas (3 CP)	<i>SM 2: Design and construction of wells and water plants (3.5 CP)</i> <i>SM 2: Water supply in urban and rural areas (1.5 CP)</i>

2nd Semester (= 30 CP)

Core modules 3, 4	Special modules 5, 7
<i>SM 7: Excursion to an semiarid region (March – April, 2 weeks) = 5 CP</i> Regular courses and block courses (April – July, 12 weeks) = 18.5 CP	
CM 3: Georesources and geohazards (3 CP) CM 3: Spatial analysis and thematic mapping with GIS (5.5 CP) CM 4: Mechanical properties of rock and soil (3.5 CP) CM 4: Stability of slopes and dams (3 CP) CM 4: Geostatistics (3.5 CP)	
<i>Block courses (July, 2 weeks) = 6.5 CP</i>	
	<i>SM 5: Isotope hydrology and dating (1.5 CP)</i> <i>SM 5: Modelling of groundwater flow and transport (5 CP)</i>

3rd Semester (= 29.5 CP)

Core modules	Special modules 5, 6, 7
<i>SM 7: Industrial excursion Germany (October, 1 week) = 3 CP opt.</i> <i>Block courses (October to December; 8 weeks) = 10.5 CP</i>	
	<i>SM 5: Tracer techniques (3.5 CP)</i> <i>SM 6: Project management, technical reports, tenders (3.5 CP)</i> <i>SM 6: Economic aspects of environmental politics (1.5 CP)</i> <i>SM 6: Seminar (2 CP)</i>
Scientific training with report (January – March; 8 weeks) = 16 CP obl.	

4th Semester (= 30 CP obl.)

Master thesis (April to September; 6 months) = 30 CP
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obl. = obligatory

opt. = optional

TropHEE with specialisation in Engineering Geology

Programme (120 CP):

Core modules (40 CP)

Special modules No. 2, 3, 6 and 7 (34 CP)

Scientific training (16 CP)

Master Thesis (30 CP)

Syllabus:**1st Semester (= 30.5 CP)**

Core modules 1, 2, 3	Special module 2
Presentation of the course and the institute, multicultural training (1 week)	
Introductory block courses (October, 2 weeks) = 10 CP	
CM 1: Geological structures and mapping (6 CP) CM 1: Mineralogical laboratory techniques (4 CP)	
Regular courses (November – February, 14 weeks) = 12.5 CP	
CM 2: Quantitative methods in hydrogeology (3.5 CP) CM 2: Groundwater chemistry and salinization (3.5 CP) CM 3: Raw materials (1.5 CP)	<i>SM 2: Integrated water resource management (4 CP)</i>
Block courses (February, 2 weeks) = 8 CP	
CM 2: Groundwater in tropical and sub-tropical areas (3 CP)	<i>SM 2: Design and construction of wells and water plants (3.5 CP)</i> <i>SM 2: Water supply in urban and rural areas (1.5 CP)</i>

2nd Semester (= 30 CP)

Core modules 3, 4	Special modules 3, 7
<i>SM 7: Excursion to an semiarid region (March – April, 2 weeks) = 5 CP</i>	
<i>Regular courses and block courses (April – July, 12 weeks) = 21.5 CP</i>	
CM 3: Georesources and geohazards (3 CP) CM 3: Spatial analysis and thematic mapping with GIS (5.5 CP) CM 4: Mechanical properties of rock and soil (3.5 CP) CM 4: Stability of slopes and dams (3 CP) CM 4: Geostatistics (3.5 CP)	<i>SM 3: Remediation techniques (3 CP)</i>
<i>Block course (July, 1 week) = 3.5 CP</i>	
	<i>SM 3: Geophysics in hydrogeology and engineering geology (3.5 CP)</i>

3rd Semester (= 29.5 CP)

Core modules	Special modules 3, 6, 7
<i>SM 7: Industrial excursion Germany (October, 1 week) = 3 CP</i>	
<i>Block courses (October to December; 8 weeks) = 10.5 CP</i>	
	<i>SM 3: Engineering geology of waste deposits (1.5 CP)</i> <i>SM 3: Applied clay mineralogy (2 CP)</i> <i>SM 6: Project management, technical reports, tenders (3.5 CP)</i> <i>SM 6: Economic aspects of environmental politics (1.5 CP)</i> <i>SM 6: Seminar (2 CP)</i>
<i>Scientific training with report (January – March; 8 weeks) = 16 CP obl.</i>	

4th Semester (= 30 CP obl.)

<i>Master thesis (April to September; 6 months) = 30 CP</i>

obl. = obligatory

opt. = optional

TropHEE with specialisation in Environmental Management

Programme (120 CP):

Core modules (40 CP)

Special modules No. 1, 4, 6 and 7 (34 CP)

Scientific training (16 CP)

Master Thesis (30 CP)

Syllabus:

1st Semester (= 31.5 CP)

Core modules 1, 2, 3	Special module 1
Presentation of the course and the institute, multicultural training (1 week) Introductory block courses (October, 2 weeks) = 10 CP obl.	
CM 1: Geological structures and mapping (6 CP) CM 1: Mineralogical laboratory techniques (4 CP)	
Regular courses (November – February, 14 weeks) = 15 CP	
CM 2: Quantitative methods in hydrogeology (3.5 CP) CM 2: Groundwater chemistry and salinization (3.5 CP) CM 3: Raw materials (1.5 CP)	SM 1: <i>Soil protection and soil erosion</i> (3.5 CP) SM 1: <i>Ecology of tropical and subtropical soils</i> (1.5 CP) SM 1: <i>Groundwater vulnerability and water directives</i> (1.5 CP) SM 1: <i>Water analysis</i> (3.5 CP)
Block courses (February, 2 weeks) = 6.5 CP	
CM 2: Groundwater in tropical and subtropical areas (3 CP)	

2nd Semester (= 30.5 CP)

Core modules 3, 4	Special modules 4, 7
<i>SM 7: Excursion to an semiarid region (March – April, 2 weeks) = 5 CP</i>	
<i>Regular courses and block courses (B) (April – July, 12 weeks) = 25.5 CP</i>	
CM 3: Georesources and geohazards (3 CP) CM 3: Spatial analysis and thematic mapping with GIS (5.5 CP) CM 4: Mechanical properties of rock and soil (3.5 CP) CM 4: Stability of slopes and dams (3 CP) CM 4: Geostatistics (3.5 CP)	<i>SM 4: Spatial and environmental planning in geosciences (3.5 CP)</i> <i>SM 4: Remote sensing in geology (3.5 CP)</i>
<i>Block course = 0 CP</i>	

3rd Semester (= 28 CP)

Core modules	Special modules 4, 6, 7
<i>SM 7: Industrial excursion Germany (October, 1 week) = 3 CP</i>	
<i>Block courses (October to December; 8 weeks) = 9 CP</i>	
	<i>SM 4: Introduction to surveying (2 CP)</i> <i>SM 6: Project management, technical reports, tenders (3.5 CP)</i> <i>SM 6: Economic aspects of environmental politics (1.5 CP)</i> <i>SM 6: Seminar (2 CP)</i>
<i>Scientific training with report (January – March; 8 weeks) = 16 CP obl.</i>	

4th Semester (= 30 CP obl.)

<i>Master thesis (April to September; 6 months) = 30 CP</i>

obl. = obligatory

opt. = *optional*