

The Eberhard Karls University of Tübingen has, since its foundation in 1477, played a vital role in the social, political, and scientific development of Germany. The strength of the Eberhard Karls University is its unmistakably individual profile, the productive tension between limited size and being open to the world. Tübingen is a cozy little town, at the same time a microcosm of science, city of young people, scholars, poets, and publishers.



Founded in the year 500 AD, the town is steeped with culture, history, and tradition. With a population of 85.000 and situated only 35 km south of Stuttgart, the capital of Baden-Württemberg, Tübingen comprises an unique mix of the old antique alongside the modern and advanced.

The university today comprises approximately 24.000 students, taught by over 450 professors. Students studying in Tübingen enjoy an extensive variety of leisure activities offered by the university, the town, and the nearby city of Stuttgart both in terms of sport, modern culture, or outdoor activities.

Application requirements:

- BSc or higher degree in geo-/environmental sciences, engineering, or related fields such as physics, chemistry, or microbiology
- Proof of adequate standard in the English language, e.g. TOEFL 213+ (cbt)

Application documents: Please visit our homepage!

Closing date for application: March 31

Master's Program start: September

Applicants depending on scholarships and requiring an advanced letter of admission please visit our homepage for more information!

For further information please contact:

Applied Environmental Geoscience
Dr. Peter Merkel
University of Tübingen
Institute for Geosciences
Sigwartstr. 10
72076 Tübingen
Germany

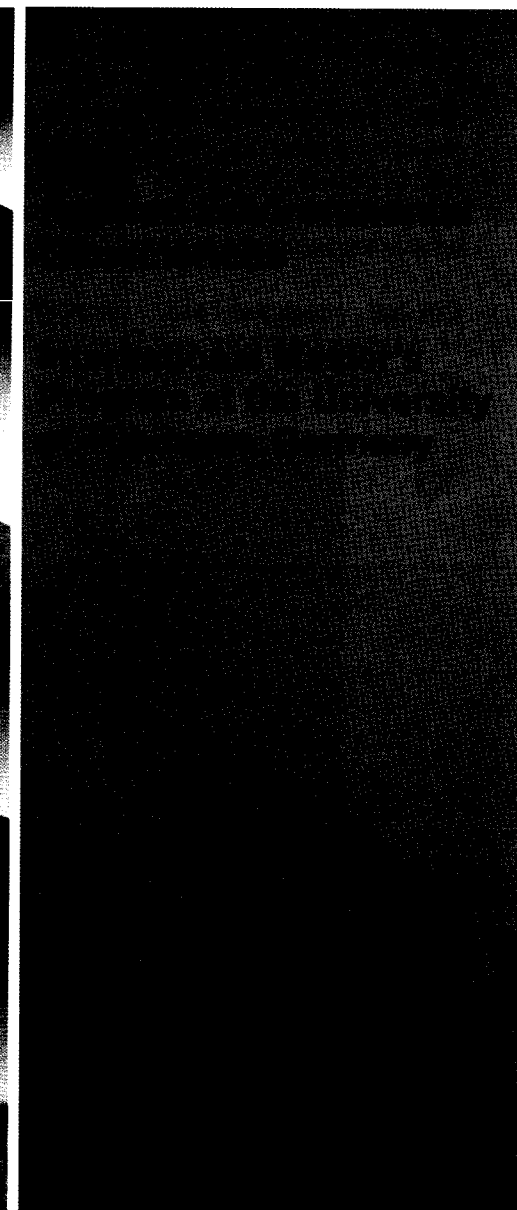
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EBERHARD KARLS
UNIVERSITÄT
TÜBINGEN

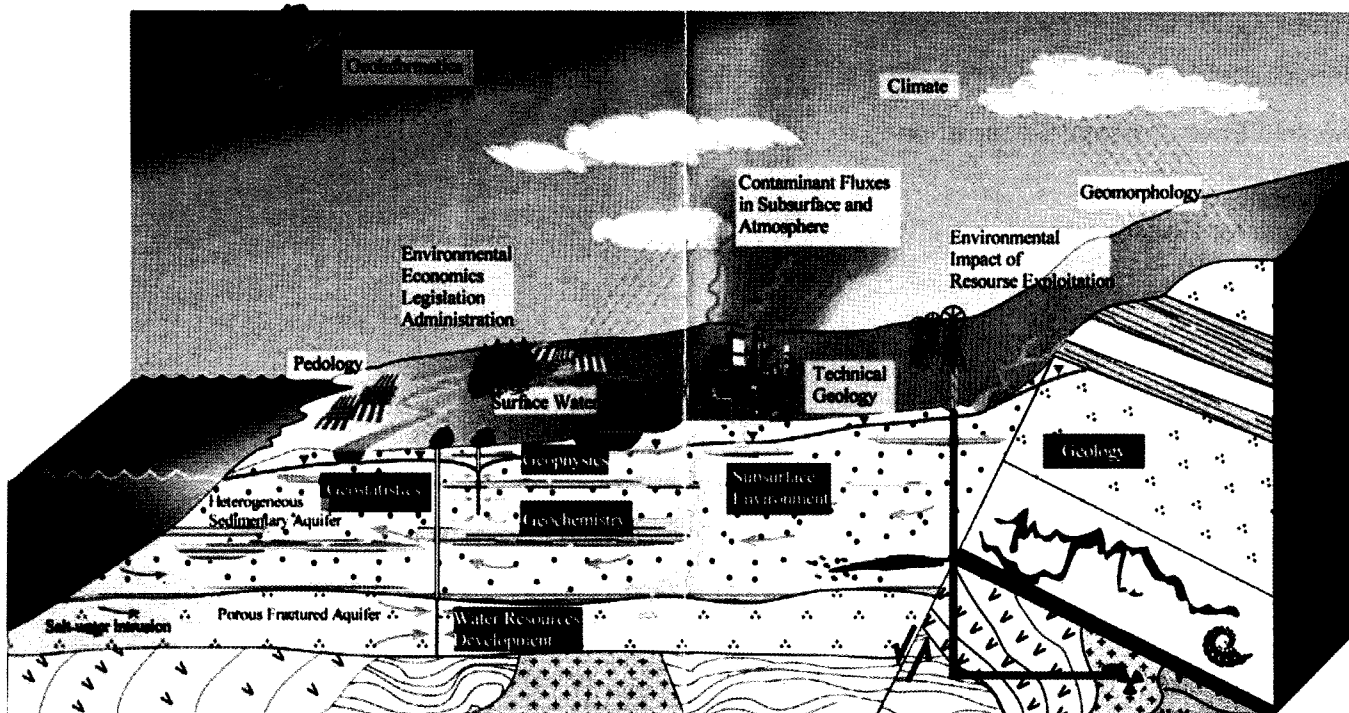


Applied Environmental Geosciences Program

The main focus of the Master's Program "Applied Environmental Geoscience" (AEG) is the quantitative analysis and evaluation of environmental problems in order to derive ecologically and economically acceptable solutions based on a multi-disciplinary approach and the application of modern technology.

The 2-year-program addresses excellent students who wish to acquire a well-founded scientific knowledge enabling them to approach complex problems in environmental engineering from a multi-disciplinary angle and to gain an internationally recognized high level of qualification. The program is taught by internationally renowned faculty members as well as by guest lecturers from other academic institutions or companies who are specialists in their fields. All courses are taught in English.

Course modules are: Geology and Hydrology, Environmental Modelling and Geoinformatics, Hydrogeochemistry and Environmental Microbiology, Technical Geology and Geophysics, Environmental Impact, and Soil, Water, Climate.

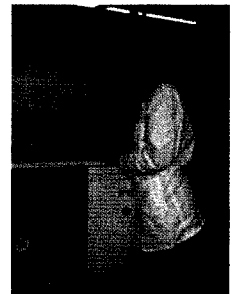


The Institute for Geosciences in Tübingen is among the largest geoscience institutes in Germany and comprises a wide spectrum of research fields, which is reflected by numerous national and international research activities.

The sixteen professors of the Institute are organized in the three branches:

- Applied Geosciences
- Biogeology and Applied Paleontology
- Geochemistry/Mineralogy

Research facilities at the Institute include extensive laboratory facilities with state-of-the-art experimental and analytical equipment as well as modern field investigation and monitoring equipment.



International Studies at the Institute for Geosciences

Since 1999 the **Applied Environmental Geoscience Program** run by the Institute hosted students from more than fifty countries from all continents of the world.

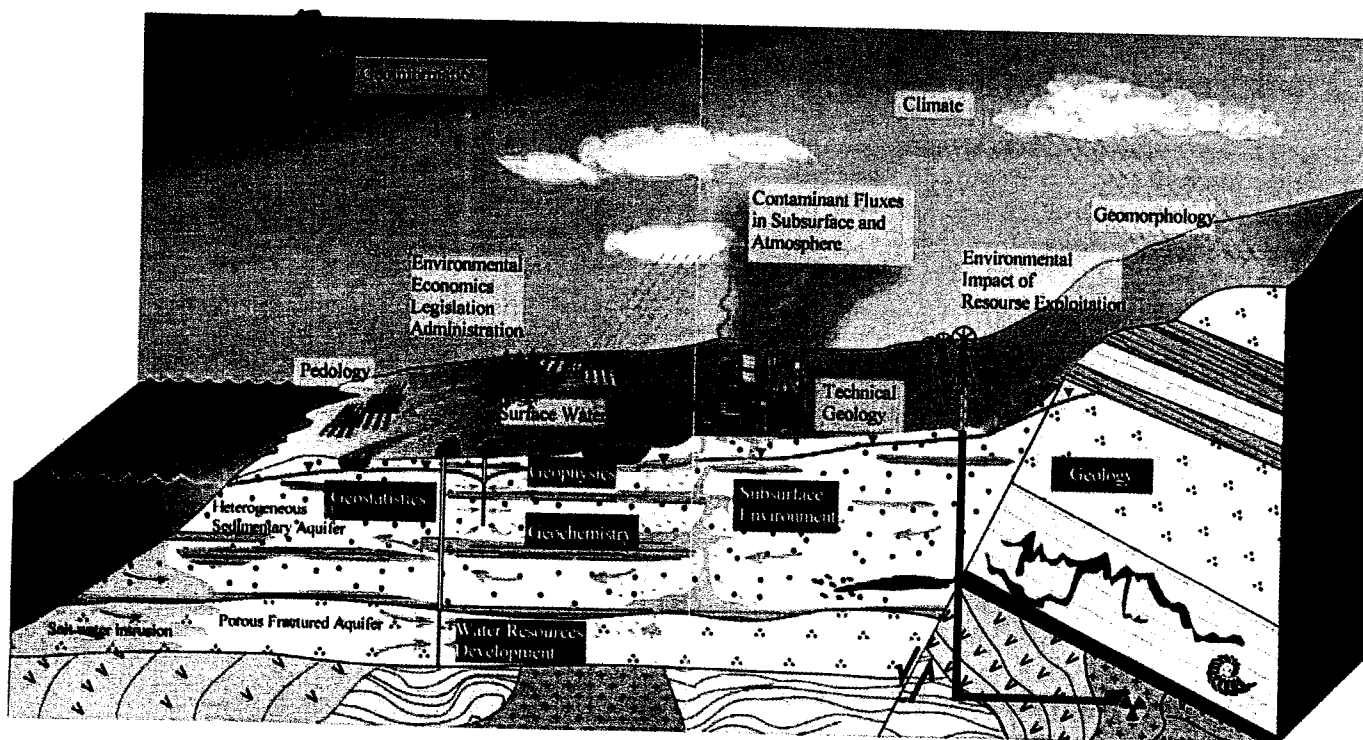
In 2004 an additional international **Doctoral Program Environmental Geoscience** was introduced to complement international studies at the Institute on the doctoral level.

Applied Environmental Geosciences Program

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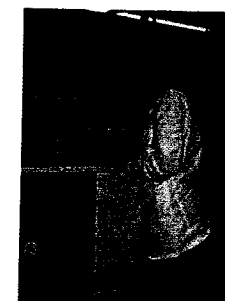


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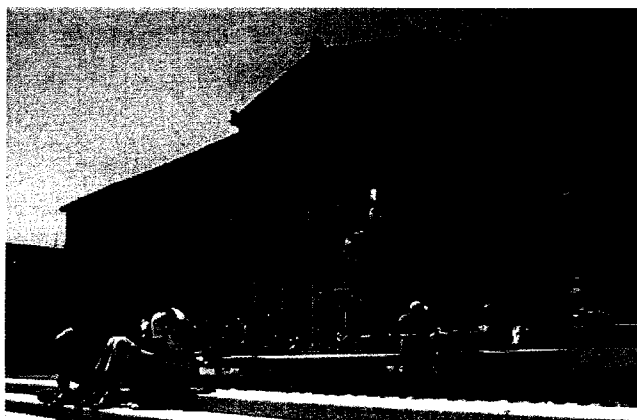


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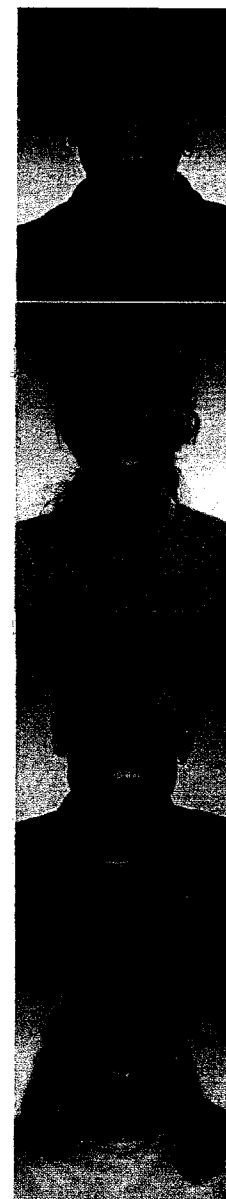
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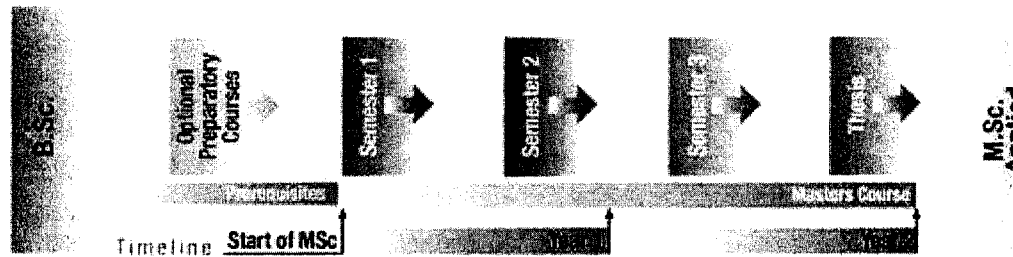


STRUCTURE OF COURSE

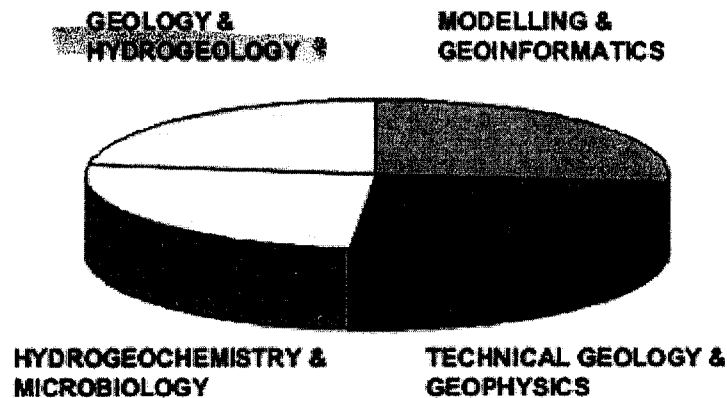
Introduction Structure **Syllabus**

- EEA Foreword
- Masters in AEG
- Core Modules
- Special Modules
- Course Staff
- Facilities
- Fees & Places
- Special Services
- FAQ
- Downloads

The course is divided into three twenty week semesters and a masters thesis. Preparatory courses in mathematics, chemistry, computing and geology are offered for students with sufficient training in these areas up to six weeks prior to the start of the first semester. Preparatory courses will have exams to evaluate the level of each student prior to the beginning of the 1. semester.

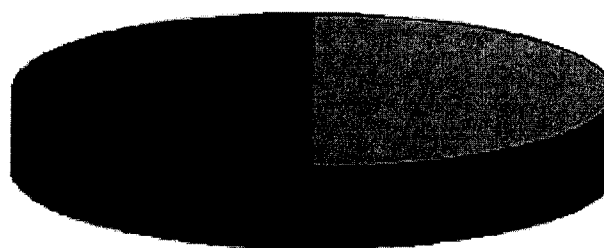


Core Modules



Starting in September 2003 a new structure has been introduced to the AEG course as result of several years of feedback from lecturing staff and students. In total 6 modules are offered, 4 mandatory core modules and 2 elective modules. The core modules refer to 4 thematic blocks of about equal importance (see pie chart), which have to be taken by all students and 2 specialized theme blocks, that give students an opportunity to gain specialized knowledge in either one module.

Elective Modules



**ENVIRONMENTAL
IMPACT**

**SOIL, WATER &
CLIMATE**

Master Thesis

A written thesis is to be prepared by students in English under the supervision of lecture course.

Opportunities exist to write this thesis in conjunction with companies and partner institut practising in geoscientific fields. German students are encouraged to undertake a projec of Germany.

✓

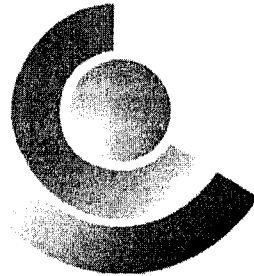
Course Assessment

Credit points, assessed by examination or course work, will be awarded to the student fi lecture series. The points are awarded in accordance with the European Credit Transfer System. A total of one hundred and twenty credit points can be reached.

System

ECTS

Σ 120 (60 + 60 ECTS)



APPLIED ENVIRONMENTAL
GEOSCIENCES

UNIVERSITY OF TUBINGEN

AEG Study Guide (Stand 4/28/2004)

Geoscience Faculty

Center for Applied Geoscience

University of Tübingen

<http://www.uni-tuebingen.de/zag/index.html>

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Sachmann
- Katesha (pdf)

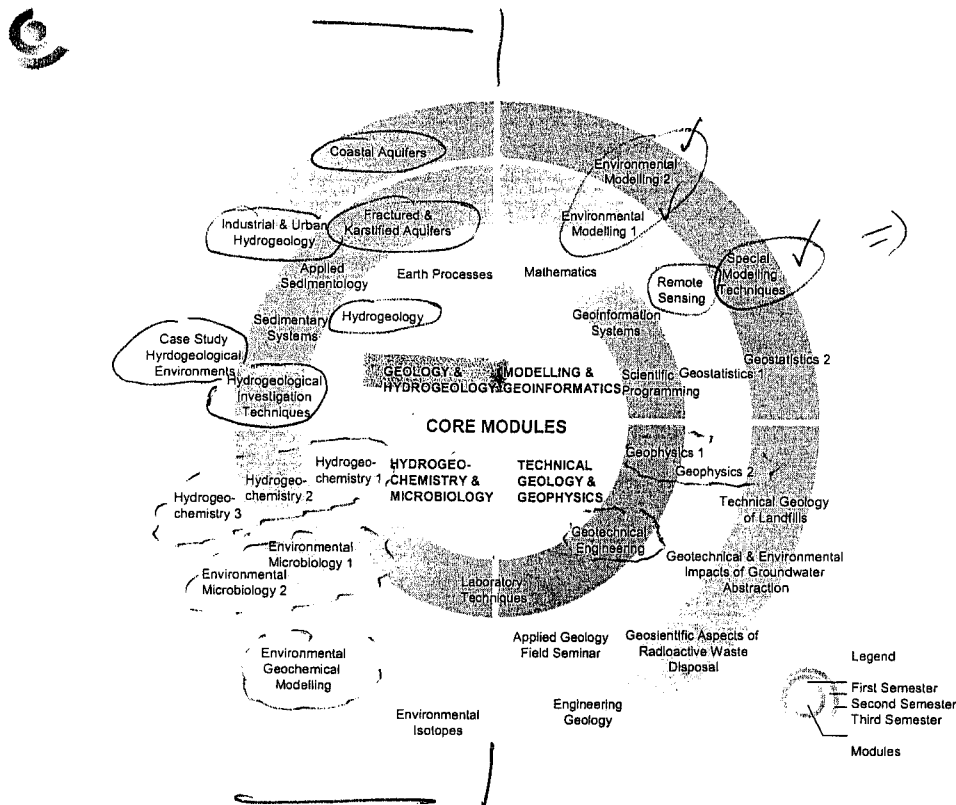


Figure 2: Overview of the Lecture Series in the Core Course Modules

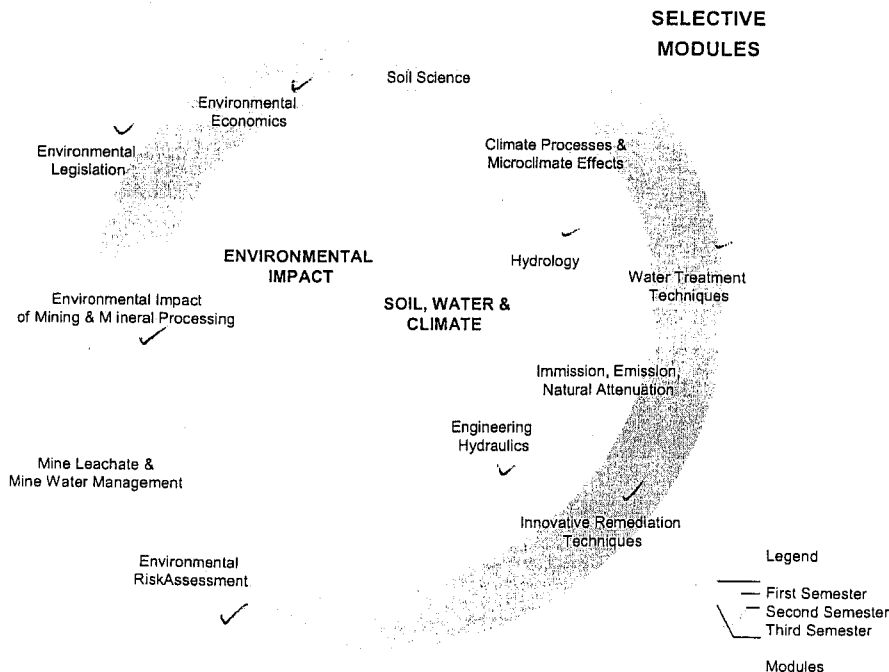


Figure 3: Overview of the Lecture Series in the Selective Course Modules



Regulations

NOTE THIS IS AN ENGLISH TRANSLATION OF THE ORIGINAL GERMAN DOCUMENT:

Examination and Study Regulations of the University of Tübingen for the International Post-Graduate Master of Science Course in Applied Environmental Geoscience

In compliance with § 51, Para. 1, Sent. 2 of the University Regulations dating from 10. January 1995 (GBI. S. 1), the Senate of Tübingen University ratified the following examination and study regulations on February 4, 1999 and July 8, 1999.

The Ministry for Science, Research and Art has granted approval in a ruling from August 2, 1999, Ref. No.: 33-818.49-2/6.

§ 1 Objective of the course and the Master of Science Examination

(1) The analysis and evaluation of environmental problems, with the objective being to develop ecologically and economically acceptable solutions based on the fundamentals of geological science, a multi-disciplinary approach and the application of modern technology, is the main theme of this Masters course, which builds on a completed professional qualification in suitable fields. The study course is also oriented toward foreign applicants; at least half of the study positions shall be reserved for foreign applicants.

(2) The Master of Science examination forms an advanced, professionally qualifying conclusion to the course. It shall be determined on the basis of the Master of Science examination whether the candidate understands the interrelationships within the field of "Applied Environmental Geoscience", possesses the ability to independently apply scientific methods and knowledge, and has gained the fundamental knowledge in this field necessary for transition to professional practice.

§ 2 Master of Science Degree

Should the Master of Science examination be successfully completed, the University of Tübingen will confer the academic degree "Master of Science" (M.Sc.) in the field of "Applied Environmental Geology" (AEG).

**) All official, status, function and professional references, which are utilised in the male form of speech in this document, apply equally to both men and women. Women can convert all official, status, function and professional, which are utilised in the male form of speech in this document, into the applicable female forms of speech. This applies especially for the conversion of tertiary qualifications, academic references and titles.¹*

§ 3 Standard period of study, course structure, lectures and examination language

(1) The standard study period, including the time required for the completion of the Masters Thesis, consists of 4 semesters.

(2) The course is divided timewise into:

a) an intensive course lasting at least 4 weeks, which takes place during the period between the beginning of September and the middle of October each year, in which those beginning the AEG course gain the necessary geoscientific, mathematical, chemical,

b) a base semester, in which the fundamentals of applied environmental geoscience are taught,

c) two focused semesters, in which specialised knowledge in applied environmental geoscience are taught, and

d) one project semester during which a Masters thesis is to be carried out.



(3) Participation in the preparatory course, following Para. 2, is a prerequisite for acceptance to the base semester. The level of capability achieved during the preparatory course does however not contribute to the overall grading of the M.Sc. course. Participation in specific sections of the preparatory course may be waived should proof of adequate relevant ability be presented.

(4) The total time required for the preparatory course is approximately 110 study hours. The total lecture series period necessary for the successful completion of the course add up to 83 SWS (1 SWS = 15 taught hours).

(5) The AEG course in the base semester and in the two focusing semesters comprises the following mandatory and elective topic related modules:

a) Four mandatory modules:

- Modelling and Geoinformatics
- Technical Geology and Geophysics
- Geology and Hydrogeology
- Hydrogeochemistry and Microbiology

b) One of the optional modules:

- Soil, Water and Climate
- Environmental Impact

(6) Each module, following Para. 5, consists of several lecture units. For each successfully completed unit a specific number of credits will be awarded independent from the examination result. The total of all allocated credits is 120. Of these, 30 credits are allocated to the Masters thesis.

(7) The study contents of intensive course lectures and the modules as well as the credits allocated to the lecture units and the modules are presented in the appendix.

(8) Should a unit not be completed due to lecturer illness, the chairman of the examination committee shall ensure that the material presented to the students is made available in a suitable form.

(9) The course language is English. Written examinations will normally be performed in English. Decisions relating to exceptions, as well as the choice of language in which oral examinations will be performed, will be made by the chairman of the examination committee, following a proposal by the candidate.

(10) The Masters thesis is to be presented in the English language. ✓

§ 4 Examination Committee and Organisation of the Examinations

(1) The Faculty of Geosciences sets up an examination committee to organise the examinations and perform the other requirements set by these examination regulations. The examination committee consists of: two professors and a representative of the scientific staff, as well as a student in an advisory capacity. A representative shall be chosen for each member. All members of the examination committee with voting rights and their representatives must be involved in the teaching program of the AEG course. On the request of the women's representatives of the faculty, one member in an advisory capacity must be drawn from the faculty commission for the advancement of women.

(2) The Chairman, his representative, the other voting members of the examination committee and their representatives are to be chosen by the Faculty Council of the Faculty of Geosciences for a three year period; the student member and his representative following a



Attachment:

Contents of the Preparatory Courses

Geology

Applied Geology

Mathematics

Chemistry

Modules

Mandatory Modules : Modeling and Geoinformatics
 Technical Geology and Geophysics
 Geology and Hydrogeology
 Hydrogeochemistry and Microbiology

Elective Modules: Soil, Water and Climate
 Environmental Impact

Contents of Lecture Modules

Modelling and Geoinformatics

Credits

- Mathematical Methods 1 ✓	3,5
- Mathematical Methods 2 ✓	3
- <u>Computer Programming</u>	2,5
- Geostatistics 1	1
- Geostatistics 2	1,5
- GIS ✓	1,5
- <u>Remote Sensing</u> ✓	1
- <u>Environmental Modelling1</u> ✓	3
- <u>Environmental Modelling2</u>	3,5
- Special Modelling Techniques	2

22,5

Technical Geology and Geophysics

- Geotechnical Engineering	2,5
- Lab Techniques	4,5
- Engineering Geology ✓	1,5
- Applied Geology Field Seminars	2
- Geoscientific Aspects of Radioactive Waste Disposal	2
- Geotechnical and Environmental Impact of	
- <u>Groundwater Abstraction</u>	1
- Impact and Technical Geology on Landfills	1,5
- Geophysics 1	2,5
- Geophysics 2	2

19,5

Geology and Hydrogeology

- Earth Processes	2,5
- Applied Sedimentary Geology	2
- Geology of Sedimentary Systems	2
- <u>Coastal Aquifers</u> ✓	1
- <u>Fractured and Karstified Aquifers</u> ✓	1
- <u>Hydrogeology</u> ✓	3,5
- <u>Hydrogeological Investigation techniques</u> ✓	1
- <u>Industrial and Urban Hydrogeology</u> ✓	2
- <u>Integrated Case Studies: Hydrogeological Environments</u> ✓	4

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General Module Description

Core Modules

Geology & Hydrogeology

Hydrogeology describes the laws of movement of water in the subsurface and its interaction with the porous solids during the flow. Therefore a sound knowledge of the subsurface and its characteristics is crucial for the understanding of hydrogeological systems. After introducing basic geological and sedimentary processes, necessary to understand how aquifers are formed, the module focuses on the description of the basic laws of ground water movement, several important hydrogeological environments and methods of aquifer investigation.

Module lectures of this module include:

- Earth Processes (Dr. P. Suess, University of Tübingen)
- Hydrogeology (Prof. Dr. G. Teutsch, University of Tübingen)
- Fractured and Karstified Aquifers (Dr. S. Birk, University of Tübingen)
- Applied Sedimentology (Prof. Dr. T. Aigner, University of Tübingen)
- Sedimentary Systems (Prof. Dr. T. Aigner, University of Tübingen)
- Hydrogeological Investigation Techniques (Prof. Dr. M. Schirmer, UFZ Leipzig)
- Coastal Aquifers (Dr. J. Guttman, Mekorot, Israel)
- Industrial and Urban Hydrogeology (Dr. H. Weiß, UFZ Leipzig)
- Case Study Hydrogeological Environments (Prof. Dr. O. Kolditz, University of Tübingen)

Modeling & Geoinformatics

Any modelling of the natural environment has to be based on a good practical understanding of the mathematical tools used to quantitatively describe the relevant processes involved. This module introduces the student to the commonly used mathematical tools and geostatistical principles involved in modelling of subsurface environments as well as to state-of-the-art numerical modelling techniques. Remote sensing and the visualization of data using GIS application are additional aspects of this module.

- Mathematical Methods (PD Dr. R. Liedl, Dr. P. Dietrich, University of Tübingen)
- Geoinformation Systems (Prof. Dr. Schröder, Fachhochschule Stuttgart)
- Scientific Programming (Prof. Dr. O. Kolditz, PD Dr. R. Liedl, University of Tübingen)
- Geostatistics 1-2 (Dr. G. Kosakowski, Paul Scherrer Institut, Switzerland)
- Remote Sensing (Dr. G. Lörcher, Magic Maps GmbH)
- Environmental Modelling 1-2 (Prof. Dr. O. Kolditz, PD Dr. R. Liedl, University of Tübingen)
- Special Modelling Techniques (Prof. Dr. E. Sudicky, University of Waterloo)

Hydrogeochemistry & Microbiology

In this module the principles of organic and inorganic hydrogeochemistry, as well as microbiology related to typical environmental problems are covered. The introductory courses are augmented with two block courses covering environmental isotopes and modelling of environmental geochemistry. The courses are aimed at the practical application