
The standard period of study for this postgraduate course was four semesters; the language of instruction was English throughout. Upon successfully completing lectures in nine compulsory modules (covering 27 lectures), five optional subjects and the Master thesis, students were awarded the academic degree of a “Master of Science (Resources Engineering)”; abbr. “M.Sc. (Res.Eng.)”. The nine compulsory modules were (description of lectures s. pages given):

- M1 Natural Sciences & Development Potentials ........................................... 1
- M2 Socio-Economics .................................................................................... 4
- M3 Data Evaluation & Mapping Techniques ............................................... 6
- M4 Regional Analysis .................................................................................... 8
- M5 Agriculture & Rural Engineering .......................................................... 10
- M6 Water Management & Energy ............................................................... 13
- M7 Waste Treatment & Environmental Protection ...................................... 15
- M8 Planning & Transportation .................................................................. 17
- M9 Management & Administration ............................................................. 19

The workload of the four-semester postgraduate program was as follows:

<table>
<thead>
<tr>
<th>Module</th>
<th>SWS [L + E]</th>
<th>Lectures + Exercises [h]</th>
<th>Contact [h]</th>
<th>Self study [h]</th>
<th>Study Reports [h]</th>
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<tr>
<td>M1</td>
<td>5 + 1</td>
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<tr>
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<td>+ 45</td>
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</table>

Σ 3600

SWS = Semesterwochenstunde = 45 min, L = Lecture + excursions, E = Exercise / Tutorials / Labcourses

* Workload factor (acc. to European Credit Transfer System (ECTS)):
  1 SWS lecture (L) corresponds to 45 work hours per semester
  1 SWS exercise (E) corresponds to 30 work hours per semester

** prerequisite to be admitted to module examinations
  (not graded and not recorded in final certificate)

From October 2008, the curriculum is continued in a modified form as a Master study program
[s. www.kit.edu/downloads/AmtlicheBekanntmachungen/2008_090.pdf]

May 20, 2011, SH/CK
Univ.-Prof. Dr. rer. nat. habil Josef Winter
Academic Director of “Resources Engineering”
### Natural Sciences & Development Potentials

**Module 1**

<table>
<thead>
<tr>
<th>Courses / WCH</th>
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<tbody>
<tr>
<td>“Ecology (ecosystems &amp; their developm. potential)”</td>
<td>1 L</td>
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<tr>
<td>“Hydromechanics”</td>
<td>1 L + 1 E</td>
</tr>
<tr>
<td>“Hydrology”</td>
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</tr>
<tr>
<td>“Water Supply Systems, Urban Drainage &amp; Solid Waste Managment”</td>
<td>2 L</td>
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Content, goals & key qualifications see p. 2

<table>
<thead>
<tr>
<th>Lecturers</th>
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<tbody>
<tr>
<td>BLENINGER, TOBIAS Dr.-Ing.</td>
<td></td>
</tr>
<tr>
<td>BUCK, WERNER Dr.-Ing.</td>
<td></td>
</tr>
<tr>
<td>HAHN, HANS HERMANN Univ.-Prof. Dr.-Ing. E.h. Ph.D.</td>
<td></td>
</tr>
<tr>
<td>KÄMPF, CHARLOTTE Dr.rer.nat.</td>
<td></td>
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<tr>
<td>RODI, WOLFGANG Univ.-Prof. Dr.-Ing.</td>
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<tr>
<td>WITTLAND, CLEMENS Dr.-Ing.</td>
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<table>
<thead>
<tr>
<th>Semesters</th>
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<th>Language</th>
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<th>Teaching modes / WCH</th>
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<td>Lectures + excursions [L]</td>
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<td>Exercises/Tutorials [E]</td>
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<table>
<thead>
<tr>
<th>Types of Assessment</th>
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<tbody>
<tr>
<td>Written examinations</td>
<td>100%</td>
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<tr>
<td>Oral examinations</td>
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<tr>
<td>Other types of assessment</td>
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<table>
<thead>
<tr>
<th>Workload</th>
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<td>Self study (14 weeks + exam prep.)</td>
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<table>
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<tr>
<th>Sum</th>
<th>255 h</th>
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<tbody>
<tr>
<td>+ Study paper</td>
<td>45 h</td>
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</tbody>
</table>
Content

Physical characteristics, physico-chemical characteristics, limiting nutrients and eutrophication, structure of aquatic ecosystems, ecological interactions, Water economy, lake ontogeny and morphology, light in lakes, thermal stratification, river ecosystems.

Basic Mechanics of Fluids" and "Engineering Hydraulics", Hydrostatics, Kinematics, Dynamics, One-Dimensional Flow Analysis, Open-Channel Flow (without losses), Dimensional Analysis, and Effects of Viscosity - Losses and Drag

Fundamentals of Engineering Hydrology, hydrologic cycle and water balance, measurement and analysis of precipitation and stream flow, rainfall-runoff modeling (isochrone method, time-area diagram Unit hydrograph method ), statistical analysis and probability distributions, basics of statistical analyses( histogram, frequency, probability, parameters), linear Regression, flood frequency analysis, effects of engineering measures on flood processes, river regulation (retention and translation ), design of flood detention basins.

Water—sources, quality requirements and demand, water treatment (basic requirements, physical processes, chemical processes), water distribution systems, wastewater origin and characteristics, wastewater collection and treatment concepts, wastewater treatment (mechanical processes, biological processes, chemical and advanced processes), sludge treatment processes, solid waste (origin and characteristics, collection systems, treatment and disposal systems).

Goals

The students should come to understand

– Ecological principles and their importance for the lotic and lentic ecosystem.
– The basic interrelations and regulation mechanisms involved
– The necessity to consider carrying capacity to ensure optimal yields
– The fundamentals of environmental and resource dynamics
– Important concepts of current ecological problems.
– Environmental and resource problem and the respective solutions

At the end of the course, students become acquainted with

– The basic properties of fluids
– Behavior of fluids under the influence of forces
– Methods for describing and analyzing the motion of fluids
– The characteristic features of flows in closed and open channels
– Methods for estimating the forces on the fluid boundaries and structures

At the end of the course, students become acquainted with

– Some of rainfall-runoff modeling techniques
– Measurements and analysis of hydrological parameters
– Methods for describing and analyzing flood frequencies
– Techniques of river regulation and flood control

At the end of the course, students becomes capable of understanding

– The public water supply quality standards set by different institutions
– The basics and working principles of water treatment processes
– Techniques of water distribution and waste water collection
– The working principles of waste water handling and sludge treatment
– The Basic properties, behavior and handling techniques of solid wastes
**Key Qualifications**

- Ecosystem oriented problem solving capability
- Written ,Verbal and Presentation skills in expressing ecosystem interactions and functions
- Analyzing and solving ecological land and water resources management problems.

- Problem solving capability in fluid applications
- Written and Verbal expression of fluid processes in real time
- Presentation skills in solving and analyzing practical problems in fluid mechanics

- Understanding seasonal variation of hydrological parameters (flooding, precipitation and runoff)
- Written, verbal and presentation skill of hydrological processes in real time
- Analyzing and solving practical problems in hydrology

- Practical skills in public water distribution and waste water collection
- Capability in designing and operating (managing) water treatment plants
- Practical skills in sludge and solid waste handling
- Written and Verbal skills in waste water treatment processes
## Socio-Economics Module 2

<table>
<thead>
<tr>
<th>Courses / WCH</th>
<th>&quot;Social Aspects of Economic Development&quot; 2 L</th>
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<tbody>
<tr>
<td></td>
<td>&quot;Concepts of Development Planning&quot; 2 L</td>
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<tr>
<td>Content, goals &amp; key qualifications see p. 2</td>
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### Lecturers

- **DOPPLER, WERNER**
  Univ.-Prof. Dr. (Universität Hohenheim)

### Semesters

- Semester 1 (Winter semester)

### Language

- English

### Teaching modes / WCH

- Lectures + excursions [L] 4 SWS

### Types of Assessment

- Written examinations 100%
- Oral examinations 0%
- Other types of assessment 0%

### Workload

- Contact hours (14 weeks) 40 h
- Self study (14 weeks + exam prep.) 140 h

**Sum 180 h**

+ Study paper 45 h
Content

Theoretical concepts in micro economic decision-making, systems approaches with special focus on rural areas, horizontal and vertical linkages, dynamics of development at micro, meso and macro level, analysis of needs and objectives, quantitative analyses of past development, bottlenecks behind development, micro-economic methodology, social and socio-cultural factors and quantification of living standard of families, decision-making and resource use.

Concepts in meso and macro economic planning and decision-making, methodology in development projects, Basic planning and implementation principles in economic planning, components of project appraisal, methodology of quantifying social costs and benefits at macro level, pricing and cost principles and methodology at macro level, economic and financial values of goods and services on world and domestic markets as well as impacts of import and export policies, methodology of cost benefit analysis, social and environmental costs and benefits, management of project implementation and project steering, financial, staff and resource management and organizations.

Goals

To familiarize students with socio-economic principles, rationale and methodologies in the context of development.

To familiarize students with economic analyses, planning and assessment at various levels from private enterprises up to regional and national level, to develop an understanding of economic planning, strategy testing and their relevance for national decision-making.

Key Qualifications

- Skills in analyzing and evaluation of social and economic profile of a community
- Understanding social and cultural impact of development projects
- Decision making capability in development processes
- Wise utilization and management of resources
- Written verbal expression and presentation skills of a community
- Skills in analyzing and evaluation of development projects at different levels
- Understanding social and cultural impact of development projects
- Decision making capability in development projects
- Wise utilization and management of resources
- Written and Verbal expression of development ideas
- Presentation skills of development projects
# Data Evaluation & Mapping Techniques  
## Module 3

<table>
<thead>
<tr>
<th>Courses / WCH</th>
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<tbody>
<tr>
<td>– “Terrestrial &amp; Hydrographic Survey”</td>
<td>1 L</td>
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<tr>
<td>– “Geoinformation Systems”</td>
<td>2 L + 1 E</td>
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Content, goals & key qualifications see p. 2

<table>
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<tbody>
<tr>
<td>– BÄHR, HANS-PETER</td>
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<tr>
<td>Univ.-Prof. Dr.-Ing.habil. Dr.h.c.</td>
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<tr>
<td>– HECK, BERNHARD</td>
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<td>Univ.-Prof. Dr.-Ing.</td>
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<td>– HENNES, MARIA</td>
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<td>Univ.-Prof. Dr.-Ing.</td>
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<td>Language</td>
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<th>Teaching modes / WCH</th>
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<td>Lectures + excursions [L]</td>
<td>3 SWS</td>
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<td>Exercises/Tutorials [E]</td>
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<td>40 h</td>
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<td>Self study (14 weeks + exam prep.)</td>
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<td><strong>Sum</strong></td>
<td><strong>165 h</strong></td>
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<tr>
<td>+ Study paper</td>
<td>45 h</td>
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</table>
Content

Introduction to Geodesy, Height Systems, Leveling (with exercise), Angle Measurement (with exercise), Geodetic Computations, Topographic Survey (with exercise), Survey Methods, Areas and Volumes, GPS (with exercise), Demonstration CAD and Engineering Survey.

Environmental monitoring by GIS in developing countries, types of imagery and data, photogrammetric mapping (stereoscopy, map compilation, image rectification, analytical point determination), remote sensing systems for ecological monitoring (multispectral scanners, radar), digital image processing methods (image enhancement, classification, geocoding) GIS hard/software and application (vector and raster approach, visualization of results), conditions for environmental monitoring in developing countries; project management and control.

Goals

At the end of the course, students understand
- The working principles of terrestrial and hydrographic Survey
- The working principles of geographical positioning

At the end of the course, students become acquainted with
- The Basic concepts of geographical information systems in environmental monitoring
- The techniques of imagery and photogrammetric data processing
- GIS software handling
- The application of GIS as a tool in project management and decision making.

Key Qualifications

Understanding the principles and applications of terrestrial and hydrographic survey techniques as well as GPS
- Imagery processing capability
- Skills in handling GIS softwares
- Written and verbal presentation skill of spatial data related with GIS
## Regional Analysis Module 4

### Courses / WCH
- “Introduction to Spatial Planning” 1 L
- “Methods of Regional Analysis” 1 L + 1 E

Content, goals & key qualifications see p. 2

### Lecturers
- **ELGENDY, HANY**
  Dr.-Ing.
- **SCHOLL, BERND**
  Univ.-Prof. Dr.sc.techn.

### Semesters
Semester 1 (Winter semester)

### Language
English

### Teaching modes / WCH
- Lectures + excursions [L] 2 SWS
- Labcourse [E] 1 SWS

### Types of Assessment
- Written examinations 100%
- Oral examinations 0%
- Other types of assessment 0%

### Workload
- Contact hours (14 weeks) 30 h
- Self study (14 weeks + exam prep.) 90 h
  **Sum** 120 h
- + Study paper 45 h
Content

History of urban development, things what spatial planning deals with, planning and decision problems, the decision tree, the cloud-tree-metapher, problem-oriented planning, levels of planning.

Decision making techniques; simulation and quantitative methods; scheduling techniques; graphical representation in planning projects; planning information systems and application of geographic information systems in spatial planning. All these tools and methods will be implemented on the mini project.

Goals

To give an insight for students on the relation between spatial planning and other disciplines that deals with natural resources including land, specially the relation between infrastructure development and spatial planning. In addition, special emphasize is given to analyzing planning and spatial development in developing countries in comparison to those in Europe and other regions in the world.

- To introduces students with some of the basic methods and instruments that are needed in spatial planning.
- To make students aquatinted with the practical application of information technology in spatial planning

Key Qualifications

- Understanding the links between spatial development and resource management
- Understanding the links between infrastructure development and spatial planning
- Written, Verbal expression and Presentation skills of spatial problems and planning processes
- Intensive application capability of information technology in spatial planning
- Written and Verbal expression of spatial planning methods and techniques
- Presentation and communication skills in solving and analyzing spatial problems
# Agriculture & Rural Engineering

## Module 5

<table>
<thead>
<tr>
<th>Courses / WCH</th>
<th>Content, goals &amp; key qualifications see p. 2</th>
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<tbody>
<tr>
<td>“Soil Science &amp; Plant Nutrition”</td>
<td>1 L</td>
</tr>
<tr>
<td>“Introduction to Trop. &amp; Subtrop. Agricult.”</td>
<td>1 L + 1 E</td>
</tr>
<tr>
<td>“Agri. Water Man., Irrigation &amp; Drainage”</td>
<td>1 L + 1 E</td>
</tr>
<tr>
<td>“Soil Erosion Assessment &amp; Control”</td>
<td>1 L + 1 E</td>
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| Lecturers | PRINZ, DIETER  
|-----------| Prof. Dr.sc.agr. |

<table>
<thead>
<tr>
<th>Semesters</th>
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<table>
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<th>Teaching modes / WCH</th>
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<tbody>
<tr>
<td>Lectures + excursions [L]</td>
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<td>Exercises/Tutorials [E]</td>
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<th>Types of Assessment</th>
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<tbody>
<tr>
<td>Written examinations</td>
<td>100%</td>
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<tr>
<td>Oral examinations</td>
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<td>Other types of assessment</td>
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<table>
<thead>
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<th>Workload</th>
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<td>Self study (14 weeks + exam prep.)</td>
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<td><strong>270 h</strong></td>
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<tr>
<td>+ Study paper</td>
<td>45 h</td>
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</table>
Content

An introduction to pedosphere, ecological functions of soil, essential soil properties including soil texture and soil structure, soil formation, including soil forming factors, parent materials, mineralogy and weathering, soil description, covering soil horizon nomenclature and worldwide used systems of soil classification, soil reaction, soil water, including soil moisture tension, infiltration and runoff, water content and hydraulic conductivity, soil biology with the flow of nutrients in an ecosystem and factors affecting biological activity, salinization and alkalinization, how to carry out a field survey, soil fertility, plant nutrition, with information on plant nutrients, organic and mineral fertilizers.

Fundamentals of ecosystems with reference to agro-ecosystems and cyclic processes, sustainable agriculture, necessity and limits of using external inputs in tropical and subtropical agricultural systems, decision factors for farming operations, main farming systems in the tropics and subtropics, (shifting cultivation, aquaculture, agro forestry, etc., their set-up, their framework conditions and carrying capacity).

Climate and agriculture, crop water requirements & uptake, field water management, irrigation water quality and methods, drainage of agricultural land and water lifting.

Forms & causes of soil degradation, extent of soil degradation, soil degradation and global issues, main soil degradation syndromes, soil erosion by water, impacts of erosion on land productivity & quantifying erosion factors; assessing soil erosion; soil conservation for water erosion; gully erosion; stream bank erosion; wind erosion; socio-economic aspects.

Goals

To make students capable of recognizing the principle characteristics of soils, their development and possible utilizations. The students acquire basic knowledge on soil science. After completing the module, they should be able to understand and recognize different soils and the relationship between individual soils and landscapes. They also acquire knowledge on general physiological and ecological aspects of plant nutrition and limiting nutrients in plant production.

- To familiarize students with the main farming systems in the tropics and subtropics.
- To increase the professional knowledge of young engineers in the tropics and subtropics in the field of agriculture, since about 80% of the water managed in tropics and subtropics is used in the agricultural sector.

At the end of the course, students understand
- The impact of climatic parameters on agriculture
- The factors affecting crop water uptake
- The different irrigation method

Students gain the knowledge and skill
- How to manage water on the field efficiently
- How to remove water safely from the field
- On water lifting techniques
At the end of the course, students become acquainted with

- The material balance of soils: location characteristics, soil movement, soil erosion processes, forms of soil erosion.
- Main soil degradation syndromes
- Gully formation processes
- Socio economic aspects of soil erosion
- Acquires the skill to assess soil erosion

**Key Qualifications**

- Understanding the relation between soil, soil forming processes, and landscapes
- Written and verbal skills of explaining types of soils, soil forming processes and ecological aspects of plant nutrition
- Familiarity with the farming systems in tropics and subtropics ecosystems
- Understanding tropical and subtropical agriculture in the context of water management
- Written and Verbal expression of farming in tropics and sub tropics
- Presentation skills of tropical and subtropical agriculture
- Understanding climate and water uptake
- Efficient and effective water management skill in agriculture
- Written, verbal expression and presentation skills in agricultural water management
- Techniques to minimize soil erosion
- Methods to asses the extent of soil erosion on a certain locality
- Written and Verbal expression soil degradation and erosion processes
- Presentation skills
### Water Management & Energy

**Module 6**

#### Courses / WCH
- "Water Resources & Water Management"  
  1 L + 1 E
- "Systems Analysis in Water Resources and Environmental Engineering"  
  2 L
- "Energy & Natural Resources"  
  2 L + 1 E

Content, goals & key qualifications see p. 2

#### Lecturers
- **CEMBROWICZ, RALF**  
  PD Dr.-Ing. habil.
- **HAHN, HANS HERMANN**  
  Univ.-Prof. Dr.-Ing. E.h. Ph.D.
- **KÄMPF, CHARLOTTE**  
  Dr.rer.nat.
- **NESTMANN, FRANZ**  
  Univ.-Prof. Dr.-Ing. Dr.h.c.mult.
- **WITTLAND, CLEMENS**  
  Dr.-Ing.

#### Semesters
- Semester 2 + 3 (Summer + Winter semester)

#### Language
- English

#### Teaching modes / WCH
- Lectures + excursions [L]  
  5 SWS
- Exercises/Tutorials [E]  
  2 SWS

#### Types of Assessment
- Written examinations  
  100%
- Oral examinations  
  0%
- Other types of assessment  
  0%

#### Workload
- Contact hours (14 weeks)  
  75 h
- Self study (14 weeks + exam prep.)  
  210 h

**Sum** 285 h

+ Study paper  
  45 h
Content


The EU framework directives, mathematical analysis and description of (river) water quality changes, modeling of lake/river systems, systems analysis (of water quality models), water quality management: systems analysis with and beyond simulation, cost and benefit aspects of river water quality, optimized pollution control through treatment optimization, regionalizing wastewater collection and treatment, regionalizing wastewater collection and treatment, introduction into linear programming

Energy basics, resources (solar, micro-hydras, wind and biomass) and reserves, energy technology options, energy management, tutorials and student discussion, excursion.

Goals

To encourage students to be creative motivated to identify problems and analyze the available data in a manner that is necessary for the preparation of their thesis work.

At the end of the course, students become acquainted with

- The principles and techniques of river/lake modeling
- The techniques of treatment optimization
- The concepts of regionalized wastewater collection and treatment

Acquire skill in linear programming

- To discuss the central role that energy and natural resources play in our society and the consequences of its utilization on our environment.
- To explore conventional and non-conventional energy resources and their extraction technologies.
- To equip students with ‘means and tools’ for the quantitative and qualitative energy appraisal.
- To stimulate ideas from students on energy conservation and future course of action.

Key Qualifications

- Problem solving capability in the field of water and land resources
- Written and Verbal expression
- Presentation skills in solving and analyzing practical problems in real world
- Understanding causes and forms of water quality changes
- Written, verbal and presentation skill
- Analyzing and solving practical problems in water resources and environmental Engineering
- Problem solving capability
- Written and Verbal expression
- Presentation skills
# Waste Treatment & Environmental Protection  
## Module 7

## Courses / WCH
- "Hygiene & Environmental Sanitation"  
  1 L  
- "Waste Analysis & Waste Treatment"  
  1 L + 1 E  
  Content, goals & key qualifications see p. 2

## Lecturers
- **Gallert, Claudia**  
  PD Dr.rer.nat.  
- **Hahn, Hans Hermann**  
  Univ.-Prof. Dr.-Ing. E.h. Ph.D.  
- **Winter, Josef**  
  Univ.-Prof. Dr.rer.nat.  
- **Wittland, Clemens**  
  Dr.-Ing.

## Semesters
- Semester 3 (Winter semester)

## Language
- English

## Teaching modes / WCH
- Lectures + excursions [L]  
  2 SWS  
- Exercises/Tutorials [E]  
  1 SWS

## Types of Assessment
- Written examinations  
  100%  
- Oral examinations  
  0%  
- Other types of assessment  
  0%

## Workload
- Contact hours (14 weeks)  
  30 h  
- Self study (14 weeks + exam prep.)  
  90 h  
  **Sum**  
  120 h  
+ Study paper  
  45 h
Content

Environmental engineering problems associated with the use of water (and land), the hydrological cycle and shortcomings of the traditional analysis (in terms of availability and suitability), the phosphorous cycle as an example of the coupling of the hydrological cycle with biologically active substance, movement and distribution of pesticides as example of the coupling of the hydrological cycle with a non degradable material that partakes in biological processes, dissolved oxygen - case study on the historic development of water quality assessment (developing criteria for water quality parameters), water quality description through physico-chemical analyses, bioassay methods for the integral analysis of water quality.


Goals

At the end of the course, students understand and acquire
- The contribution of different nutrients in the process of assimilation dissimilation process
- Behavior of nutrients in biological processes
- The criteria for water quality description
- Methods for describing and analyzing the water quality parameters

At the end of the course, students become acquainted with
- The basic properties of biowastes
- Principles of biological waste treatment processes
- Methods of waste water analysis and handling

Key Qualifications

- Problem solving capability
- Written and Verbal expression
- Presentation skills
- Biological waste water handling capability
- Written and Verbal expression of biowaste handling processes
- Presentation skills biological waste and wastewater treatment
## Planning & Transportation

### Courses / WCH

- "Regional & Urban Planning"  
  1 L + 1 E
- "Traffic Planning & System Analysis"  
  2 L
- "Highway & Railroad Engineering"  
  2 L
- "Safety Management in Highway Engineering"  
  1 L + 1 E

Content, goals & key qualifications see p. 2

### Lecturers

- ELGENDY, HANY  
  Dr.-Ing.
- HESS, RAINER  
  Dr.-Ing.
- HOHNECKER, EBERHARD  
  Univ.-Prof. Dr.-Ing.
- ROOS, RALF  
  Univ.-Prof. Dr.-Ing. Dr.h.c.
- SCHOLL, BERND  
  Univ.-Prof. Dr.sc.techn.
- VORTISCH, PETER  
  Dr.-Ing.

### Semesters

Semester 3 (Winter semester)

### Language

English

### Teaching modes / WCH

- Lectures + excursions [L]  
  6 SWS
- Exercises/Tutorials [E]  
  2 SWS

### Types of Assessment

- Written examinations  
  100%
- Oral examinations  
  0%
- Other types of assessment  
  0%

### Workload

- Contact hours (14 weeks)  
  85 h
- Self study (14 weeks + exam prep.)  
  245 h

**Sum**  
330 h

+ Study paper  
45 h
Content

History of regional and urban planning, spatial planning in different countries, Planning parameters and planning criteria (Natural, urban, social and demographic, legal and administrative, financial and administrative), city networks, sustainable regional settlement management in Stuttgart, decision making in urban planning.

Introduction to transportation planning, planning process, analysis of transportation supply and demand, transportation models, travel demand, surveying the travel demand, mode choice, route choice and assignment, ecological impacts of transport, integrated network planning, design of road network, design of public transport networks.

Definition of traffic safety – Safety feeling – Traffic conflict technique – Accident occurrence

- not available -

Goals

Students will be introduced to the discipline of urban and regional planning. More concentration will be given to urban development in cities and its regional effect. Students are expected to develop a proposal for an urban development project. This course is organized to give time for students’ practical work. Hence, design workshops will be organized to develop the planning proposal.

At the end of the course, students become acquainted with
- The concepts of strategically transport planning and planning processes
- The techniques of transport supply and demand analysis
- The principles of transportation modeling and integrated network planning
- The techniques used in designing road network and public transport network

- not available -

Key Qualifications

- Skills in urban planning
- Techniques in regional analysis
- Written and Verbal expression of development ideas
- Presentation skills and communicating development ideas.
- Problem solving capability in urban transportation
- Written and Verbal expression capability of transport planning processes
- Presentation skills

- not available -

- not available -
### Management & Administration - Module 9

<table>
<thead>
<tr>
<th>Courses / WCH</th>
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<tbody>
<tr>
<td>“Internat. Project Managem. &amp; Consulting”</td>
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<tr>
<td>“Operation &amp; Maintenance of Capital Goods”</td>
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<tr>
<td>“Institutions for Technical, Scientific &amp; Financial Cooperation”</td>
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<tr>
<td>“Environmental Impact Assessment”</td>
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<td>Content, goals &amp; key qualifications see p. 2</td>
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#### Lectures

- CEMBROWICZ, RALF
  PD Dr.-Ing. habil.
- GEHBAUER, FRITZ
  Univ.-Prof. Dr.-Ing., M.S.
- KÄMPF, CHARLOTTE
  Dr.rer.nat.

<table>
<thead>
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<th>Semesters</th>
<th>Semester 3 (Winter semester)</th>
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<tr>
<td>Lectures + excursions [L]</td>
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<tbody>
<tr>
<td>Contact hours (14 weeks)</td>
<td>40 h</td>
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<tr>
<td>Self study (14 weeks + exam prep.)</td>
<td>140 h</td>
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<tr>
<td><strong>Sum</strong></td>
<td><strong>180 h</strong></td>
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<td>+ Study paper</td>
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Content

Spare parts strategies, mineral processing and concrete mixing plants, facts in developing countries, policy planning, computer integrated road construction, maintenance of heavy earthmoving equipment, tower cranes, water distribution and sewage systems, rope excavators and mobile cranes, roads, bridges, training, commissioning and handover.

An overview of technical, scientific and financial institutions all over the world, technical institutions in Germany, scientific institutions in Germany, financial institutions in Germany.

Environmental management in general (introduction and overview of EIA); EIA processes; strategic environmental assessment; environmental impact assessment techniques; Law, policy and institutional arrangements for EIA systems; Public involvement, EIA project management, Social impact assessment, future directions.

Goals

To introduce students with the different technical, scientific and financial institutions all over the world.

To familiarize students with the major technical, scientific and financial institutions found in Germany (their main objectives and activities) mainly engaged in supporting the prevailing system in developing countries.

To give an insight for students on the relation between development concepts and their impact on the environment, in particular the relation between regional and local development (social and technical infrastructure development) and their impact on the ecosystem. At the end of the course, students become acquainted with the concepts of strategic environmental assessment, EIA processes and different techniques used to assess the impacts of a project on the environment and mitigation techniques before the project implementation.

Key Qualifications

Problem solving and decision making capability
Enhanced written and verbal expression of scenarios
Enhanced presentation skills