Module label: Special Abiotic Factors (Soil/Water)
Module code: lök360
Credit points: 6.0 KP
Workload: 180 h
Used in course of study: Master’s Programme Landscape Ecology > Vertiefungsmodule drittes Fachsemester

Module responsibility
- Luise Dorothee Giani
- Janek Greskowiak
- Birte Junge
- Gudrun Massmann

 Authorized examiners
- Luise Dorothee Giani
- Janek Greskowiak
- Birte Junge
- Gudrun Massmann

 Module counseling
- Luise Dorothee Giani
- Gudrun Massmann

Entry requirements
- Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
- Applied modelling of water and solute transport in groundwater:
  Impartment of knowledge into quantitative hydrogeology (hydraulics and advection-dispersion).
  Qualification to develop simple groundwater flow and transport models.
- Hydrochemical modelling of water-rock interactions using PHREEQC:
  Impartment of knowledge into quantitative hydrogeochemistry and skills in hydrogeochemical modelling.
- Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands):
  Impartment of knowledge into distribution, properties and classification of soils of the world.
  Qualification to apply the World Reference Base for Soil Resources (WRB) and to identify the soils of the world.
- Special soil science field and laboratory exercises:
  Impartment of knowledge into specific field and laboratory methods.
  Qualification to select and apply specific field and laboratory methods as well as to analyse and interpret results.

Module contents
- Applied modelling of water and solute transport in groundwater:
- Hydrochemical modelling of water-rock interactions using PHREEQC:
  Modelling of hydrogeochemical processes (speciation reactions and mineral reactions, pyrite oxidation, oxidation of organic matter, redox reactions, ion exchange, equilibrium reactions and reaction kinetics) using the software PHREEQC (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/)
- Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands):
  Application of the international soil classification system "WRB", step-wise familiarization with soils and their properties as well as with the related landscapes and catenas (from polar to tropical soils), study of varnished profiles of globally distributed soils.
- Special soil science field and laboratory exercises:
  Selection of current scientific objectives, construction of a sampling and investigation design, performance of field studies (preferably abroad) and laboratory analysis, analysis and interpretation of results.

Reader’s advisory

International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; www.fao.org/3/a-i3794e.pdf -see also announcements in StudIP

**Links**

**Languages of instruction**
German, English

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Reference text**
The module can be taken as a 6 CP or a 9 CP module. For the 6 CP module, 2 of the 4 courses offered must be attended, for the 9 CP module, 3 of the 4 courses

**Modullevel**
MM (Mastermodul)

**Modulart**
Wahlpflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

**Final exam of module**
Time of examination: Before the end of the module
Type of examination: Oral examination or housework

**Course type**

- **Lecture**
  - Comment: 5.00
  - Frequency: 70 h

- **Exercises**
  - Comment: 5.00
  - Frequency: 70 h

**Total time of attendance for the module**
140 h