Iök360 - Special Abiotic Factors (Soil/Water)

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

Skills to be acquired in this module

E: 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.

E: Hydrochemical modelling of water-rock interactions using PHREEQC:
Impartment of knowledge into quantitative hydrogeochemistry and skills in hydrogeochemical
modelling.

L: 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.

E: 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

E: Applied modelling of water and solute transport in groundwater:
Performance of a sandbox experiment. Numerical modelling of groundwater flow and solute
transport using PMWIN (http://www.simcore.com): Model setup, parameterization and numerical
solution of the groundwater flow and advection-dispersion equations.

E: 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/)

L: 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.

E: 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
  Balkema.
  Gebrüder Borntraeger Berlin.

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

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<th>Examination</th>
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<td>Final exam of module</td>
<td>Before the end of the module</td>
<td>Oral examination or housework</td>
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<td>Exercises</td>
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Total time of attendance for the module
140 h