Modules for Landscape Ecology

Basismodule

lök100 - Data Modelling

<table>
<thead>
<tr>
<th>Module label</th>
<th>Data Modelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök100</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
</tbody>
</table>

Used in course of study

- Master Landschaftsökologie > Basismodule

Contact person

Module responsibility

- Vanessa Minden

Authorized examiners

- Vanessa Minden
- Cord Peppler-Lisbach

Module counselling

- Vanessa Minden

Entry requirements

Skills to be acquired in this module

- Basic methods of explorative statistics and adequate application of statistical tests relevant to ecological data.
- To learn, interpret and apply methods of habitat modelling.
- To understand the fundamentals of spatial explicit analysis of species-environment relationships as well as the fundamentals of spatial prediction of environmental requirements in species.
- To adequately analyse measured and observed spatial data applying methods of spatial statistics and geostatistics, respectively.
- To learn and to understand relevant methods of multivariate analysis of vegetation data.
- To be able to interpret and to assess the results obtained as well as the relevant literature.
- To be able to apply the treated methods independently.
- To learn and to improve skills in using the statistics software R.

Module contents

Part 1: Introduction to statistical analysis of ecological data NN (NN)

- Experimental design
- Explorative data analysis
- Distribution tests, data transformation
- Chi² test
- Anova, Kruskal-Wallis test
- t & U test
- Multiple comparisons, post-hoc tests

Part 2: Habitat modelling and spatial statistics (Biedermann)

- Linear (OLS) regression
- GLM (logistic regression, Poisson regression)
- Spatial explicit modelling, GIS integration
- Spatial statistics

Part 3: Multivariate analysis of vegetation ecological data (Peppler-Lisbach)

Classification:

- Cluster analysis
- Statistical degrees of fidelity

Ordination:

- Indirect procedures: PCA, CA, DCA
- Canonical procedures: RDA, CCA
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Links</strong></td>
<td><a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a></td>
</tr>
<tr>
<td><strong>Language of instruction</strong></td>
<td>German</td>
</tr>
<tr>
<td><strong>Duration (semesters)</strong></td>
<td>1 Semester</td>
</tr>
<tr>
<td><strong>Module frequency</strong></td>
<td>jährlich</td>
</tr>
<tr>
<td><strong>Module capacity</strong></td>
<td>unlimited</td>
</tr>
<tr>
<td><strong>Module level</strong></td>
<td>MM (Mastermodul / Master module)</td>
</tr>
<tr>
<td><strong>Moduleart</strong></td>
<td>Wahlpflicht / Elective</td>
</tr>
<tr>
<td><strong>Lern-/Lehrform / Type of program</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Previous knowledge</strong></td>
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</tr>
<tr>
<td><strong>Examination</strong></td>
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</tr>
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<td><strong>Final exam of module</strong></td>
<td>Before the end of the course</td>
</tr>
<tr>
<td><strong>Course type</strong></td>
<td>Exercises</td>
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<tr>
<td><strong>SWS</strong></td>
<td>6.00</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>WiSe</td>
</tr>
<tr>
<td><strong>Workload attendance</strong></td>
<td>84 h</td>
</tr>
</tbody>
</table>
lök110 - Ecology

Module label
Ecology

Module code
lök110

Credit points
6.0 KP

Workload
180 h

Used in course of study
- Master Landschaftsökologie > Basismodule

Contact person
Module responsibility
- Michael Kleyer

Authorized examiners
- Michael Kleyer
- Gerhard Wolfgang Zotz
- Ellen Kiel

Module counseling
- Gerhard Wolfgang Zotz
- Ellen Kiel
- Michael Kleyer

Entry requirements
Knowledge of phytosociology, zoo-ecology, pedology and ecology, comparable to the corresponding modules of BSc. Environmental Sciences

Skills to be acquired in this module
Qualification imparted to students:
Upon successful completion of the module the students will gain:

- a thorough knowledge of environmental conditions and biological mechanisms enabling plant species to survive in landscapes
- a thorough knowledge of the eco-physiology of plants in landscapes
- a thorough knowledge of the environmental conditions and biological mechanisms enabling animals to survive in landscapes

Ranking/position of the module within the course of studies:
In the initial phase of the Master programme, this module imparts theories and models of the conditions of survival in plant and animals species as well as of the abiotic/biotic interdependencies in heterogenous landscapes. In combination with other compulsory modules it serves to give students a survey of the special field of Landscape Ecology and to enable them to competently select advanced modules in the following semesters.

Module contents
Ecology of plants in landscapes
Eco-physiology of plants in landscapes
Ecology of animals in landscapes

Reader's advisory
Literature will be announced during the course.

Links
https://www.uni-oldenburg.de/en/landeco/

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
jährlich

Module capacity
unlimited

Modullevel
MM (Mastermodul)

Modulart
Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination
Final exam of module
Before the end of the module
a) Written examination (33 %)
b) Written examination (33 %)
c) Written examination (33 %)

Course type
Lecture

SWS
3.00

Frequency

Workload attendance
42 h
# lök120 - Geoecological Processes

<table>
<thead>
<tr>
<th>Module label</th>
<th>Geoecological Processes</th>
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<tbody>
<tr>
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<td>lök120</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Used in course of study</td>
<td>Master Landschaftsökologie &gt; Basismodule</td>
</tr>
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</table>

## Contact person
- Module responsibility
  - Luise Dorothee Giani
- Authorized examiners
  - Holger Freund
  - Luise Dorothee Giani
  - Gudrun Massmann

## Entry requirements
Upon successful completion of the module the students will gain:
- advanced skills in analysing a landscape unit
- a thorough knowledge of geological, pedological, hydrological, hydrogeological, and botanical relationships within an ecosystem
- a thorough knowledge of the genesis and properties of Northwest German soils
- a thorough knowledge of hydrological and hydrogeological properties of Northwest Germany
- a fundamental knowledge of national and international soil systematics
- the qualification to ecologically record and assess soils (including humus form)
- the ability to perform soil ecological interpretations

## Module contents
- Landscape unitSpiekeroog (EX/E)
- Special Pedology (L)
- Special Hydrogeology (L)
- Pedological field work (E)

## Reader’s advisory
Literature will be announced during the lecture.

## Links

## Language of instruction
German

## Duration (semesters)
1 Semester

## Module frequency
jährlich

## Module capacity
30

## Modullevel
MM (Mastermodul / Master module)

## Modulart
Wahlpflicht / Elective

## Lern-/Lehrform / Type of program
V/Ü/EX

## Vorkenntnisse / Previous knowledge

## Examination
- Time of examination: Before the end of the module
- Type of examination: Written examination

## Final exam of module

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
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</table>

## Total time of attendance for the module
56 h
# lök130 - Environmental Planning

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök130</td>
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<tr>
<td>Credit points</td>
<td>9.0 KP</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
</tr>
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<td>Used in course of study</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Master Landschaftsökologie &gt; Basismodule</td>
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<tr>
<td></td>
<td>Master Sustainability Economics and Management &gt; Ergänzungsmodul</td>
</tr>
</tbody>
</table>

**Contact person**

- Module responsibility
  - Peter Schaal
- Authorized examiners
  - Luise Dorothee Giani
  - Peter Schaal
  - Thomas Lecke-Lopatta
- Module counseling
  - Peter Schaal

**Entry requirements**

Basic knowledge of environmental planning. Students who have not gained such basic knowledge during the Bachelor course please contact the persons responsible for the module in order to evaluate possibilities for catching up relevant knowledge.

**Skills to be acquired in this module**

The students will

- gain advanced knowledge into the formal and informal organization of spatial developmental processes in a combination of disciplinary and interdisciplinary concepts;
- get to know the system of privileged planning combined with cross-section planning as well as investigate and assess possible deductions for concrete decision making;
- elaborate case studies and typical planning problems in seminar papers and develop their own positions regarding the instruments;
- get to know assessment methods for all important ecosystem compartments and gain the skills to deduce ecosystem services from ecosystem functions.

**Module contents**

a) Development of models and assessment of ecosystem functions for environmental planning:
   Presentation of theoretical concepts and practicable methods applied to assess ecosystem functions

b) Actor-oriented planning instruments:
   Presentation of aims, forms and mechanisms of formal and informal instruments of area and environmental planning considering participative forms of the actor in different frameworks

c) Special planning:
   Presentation of legal grounds, organization, instruments and practical methods of planning institutions including negative or positive impacts on the environmental quality for humans and nature. Possibilities of influencing the planning results from the point of view of precautionary environmental protection

d) Conservation and Evaluation of Soils:
   Presentation of legal grounds, practical methods and opportunities for soil protection and soil evaluation in regional and environmental planning.

**Reader's advisory**


Additional literature will be announced during the lectures.

**Links**

https://www.uni-oldenburg.de/en/landeco/

**Language of instruction**

German

**Duration (semesters)**

1 Semester

**Module frequency**

jährlich

**Module capacity**

unlimited

**Modullevel**

MM (Mastermodul)

**Modulart**

Wahlpflicht
<table>
<thead>
<tr>
<th>Lern-/Lehrform / Type of program</th>
<th>Vorkenntnisse / Previous knowledge</th>
<th>Examination</th>
<th>Type of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
<td>Before the end of the module</td>
<td>Seminar paper</td>
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| Course type                     | Seminar                          |  |
|---------------------------------|----------------------------------|  |
| SWS                             | 6.00                             |  |
| Frequency                       |                                  |  |
| Workload attendance             | 84 h                             |  |
### lök140 - Applied GIS Methods in Landscape Ecology

<table>
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<tr>
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<tr>
<td><strong>Workload</strong></td>
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<tr>
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<td>Master Landschaftsökologie &gt; Basismodule</td>
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#### Contact person
- **Module responsibility**
  - Peter Schaal
- **Authorized examiners**
  - Peter Schaal
  - Christian Aden
- **Module counseling**
  - Peter Schaal
  - Christian Aden

#### Entry requirements

#### Skills to be acquired in this module

#### Module contents

#### Reader's advisory

#### Links

#### Language of instruction
- German

#### Duration (semesters)
- 1 Semester

#### Module frequency
- ---

#### Module capacity
- 30

#### Modullevel
- je nach Studiengang Pflicht oder Wahlpflicht

#### Lern-/Lehrform / Type of program

#### Vorkenntnisse / Previous knowledge

#### Examination

<table>
<thead>
<tr>
<th><strong>Final exam of module</strong></th>
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<tbody>
<tr>
<td><strong>Course type</strong></td>
<td>Exercises</td>
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<tr>
<td><strong>SWS</strong></td>
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</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>SuSe or WiSe</td>
</tr>
<tr>
<td><strong>Workload attendance</strong></td>
<td>56 h</td>
</tr>
<tr>
<td><strong>Module label</strong></td>
<td>Geospatial Datamanagement and Geostatistical Analysis</td>
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<td><strong>Module code</strong></td>
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<tr>
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<tr>
<td><strong>Used in course of study</strong></td>
<td>Master Landschaftskologie &gt; Basismodule</td>
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</table>
| **Contact person** | Module responsibility  
|                  | - Peter Schaal                                       |
|                  | Authorized examiners                                |
|                  | - Peter Schaal                                       |
|                  | - Christian Aden                                     |
|                  | Module counseling                                    |
|                  | - Peter Schaal                                       |

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader’s advisory**

**Links**

**Language of instruction** | German |
**Duration (semesters)** | 1 Semester |

**Module frequency**

<table>
<thead>
<tr>
<th><strong>Module capacity</strong></th>
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<tbody>
<tr>
<td><strong>Modulart</strong></td>
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<tr>
<td></td>
<td>je nach Studiengang Pflicht oder Wahlpflicht</td>
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</table>

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

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th><strong>Examination</strong></th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td></td>
<td>Ü</td>
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**Course type**

<table>
<thead>
<tr>
<th><strong>SWS</strong></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td>SuSe or WiSe</td>
</tr>
</tbody>
</table>

**Workload attendance** | 56 h |
Vertiefungsmodul zweites Fachsemester

lök210 - Practice of Nature Conservation

<table>
<thead>
<tr>
<th>Module label</th>
<th>Practice of Nature Conservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök210</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
</tbody>
</table>

**Used in course of study**
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
- Master Sustainability Economics and Management > Ergänzungsmodul
- Master Water and Coastal Management > Bereich Science

**Contact person**

- **Module responsibility**
  - Rainer Buchwald
  - Ingo Mose
- **Authorized examiners**
  - Rainer Buchwald
  - Ingo Mose
  - Thomas Fartmann
  - Robert Sprenger

**Entry requirements**
- Completed ecology-oriented Bachelor course

**Skills to be acquired in this module**
With the successful completion of the module the students will gain a general and advanced knowledge of crucial approaches and instruments of nature conservation in Germany and Europe, especially of the implementation of large protected areas (NSG, biosphere reserve, national park etc.), of maintenance/management projects and measures as well as of approaches to their integration into nature conservation and regional development strategies (via agriculture, tourism etc.) in co-operation with national park administrative authorities and other relevant actors. Additionally, the module gives basic skills in developing ecological connectivity systems (example dragonflies) as well as in developing and implementing approaches to ecological planning inside and outside the nature reserves.

**Ranking/position of the module within the course of studies:** The module focuses on problems, methods, results, and analyses relevant to nature conservation and refers to corresponding issues of modules in Bachelor courses as well as of basic modules in Master courses of Landscape Ecology.

**Module contents**

a) Seminar "Protected areas and regional development": Survey of the most important types of large protected areas in Europe as well as current concepts of integrating the purposes of conservation with the tasks of regional development especially in peripheral rural areas
b) Seminar "Introduction to the German Nature Conservation Law": This course deals with some parts of the Nature Conservation Law of Germany and Lower Saxony and discusses their relevance to the actual Nature Conservation policy in Northwest-Germany.

c) Field course "Habitat connectivity": Theory of ecological connectivity including causes and impacts of fragmentation and isolation in nature-near biotopes; investigation of migration and dispersal behaviour in selected dragonfly species of ditch systems
d) Excursion "Protected areas": Presentation of a selected large protected area in Germany or Europe especially considering geographical, floristic, faunistic, historical, agricultural, and nature conservation aspects as well as aspects of landscape and economics

**Reader's advisory**

**Links**
- Languages of instruction: German, English
- Duration (semesters): 1 Semester
- Module frequency: jährlich
- Module capacity: 35
- Module level: ---
- Moduleart: je nach Studiengang Pflicht oder Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**

<p>| Time of examination | Type of examination |</p>
<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Final exam of module</strong></td>
<td>Before the end of the module</td>
<td>6 CP = Paper (in the course of a seminar) or excursion report or assignment</td>
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</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>1.00</td>
<td></td>
<td>14 h</td>
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<tr>
<td>Exercises</td>
<td></td>
<td>1.00</td>
<td></td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
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<td>2.00</td>
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<td>28 h</td>
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<tr>
<td>Study trip</td>
<td></td>
<td>3.00</td>
<td></td>
<td>42 h</td>
</tr>
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</table>

**Total time of attendance for the module** 98 h
Module label: Practice of Nature Conservation
Module code: lök211
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

Contact person:
- Module responsibility: Rainer Buchwald, Ingo Mose
- Authorized examiners: Rainer Buchwald, Ingo Mose, Thomas Fartmann, Robert Sprenger

Entry requirements:
Completed ecology-oriented Bachelor course

Skills to be acquired in this module:
With the successful completion of the module the students will gain a general and advanced knowledge of crucial approaches and instruments of nature conservation in Germany and Europe, especially of the implementation of large protected areas (NSG, biosphere reserve, national park etc.), of maintenance/management projects and measures as well as of approaches to their integration into nature conservation and regional development strategies (via agriculture, tourism etc.) in co-operation with national park administrative authorities and other relevant actors. Additionally, the module gives basic skills in developing ecological connectivity systems (example dragonflies) as well as in developing and implementing approaches to ecological planning inside and outside the nature reserves.

Ranking/position of the module within the course of studies: The module focuses on problems, methods, results, and analyses relevant to nature conservation and refers to corresponding issues of modules in Bachelor courses as well as of basic modules in Master courses of Landscape Ecology.

Module contents:
a) Seminar "Protected areas and regional development": Survey of the most important types of large protected areas in Europe as well as current concepts of integrating the purposes of conservation with the tasks of regional development especially in peripheral rural areas
b) Seminar "Introduction to the German Nature Conservation Law": This course deals with some parts of the Nature Conservation Law of Germany and Lower Saxony and discusses their relevance to the actual Nature Conservation policy in Northwest-Germany. **this seminar takes place in the winter term**
c) Fieldcourse "Habitat connectivity": Theory of ecological connectivity including causes and impacts of fragmentation and isolation in nature-near biotopes; investigation of migration and dispersal behaviour in selected dragonfly species of ditch systems
d) Excursion "Protected areas": Presentation of a selected large protected area in Germany or Europe especially considering geographical, floristic, faunistic, historical, agricultural, and nature conservation aspects as well as aspects of landscape and economics

Reader's advisory:

Links:
Languages of instruction: German, English
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: 35
Modulart: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:
- Time of examination: Before the end of the module
- Type of examination: 9 CP – graded oral examination (Mose/Buchwald), additionally active participation in both seminars

Course type:
- Lecture: 1.00
- Comment: 14 h

Workload attendance:
- SWS: 11 / 42
<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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</thead>
<tbody>
<tr>
<td>Exercises</td>
<td></td>
<td>1.00</td>
<td></td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
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<td>2.00</td>
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<td>28 h</td>
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<tr>
<td>Study trip</td>
<td></td>
<td>3.00</td>
<td></td>
<td>42 h</td>
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<tr>
<td><strong>Total time of attendance for the module</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>98 h</strong></td>
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## lök225 - Ecology of the Soil-Water-Plant-System

**Module label**  
Ecology of the Soil-Water-Plant-System

**Module code**  
lök225

**Credit points**  
6.0 KP

**Workload**  
180 h

**Used in course of study**  
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

**Contact person**

- Module responsibility  
  - Gudrun Massmann

- Authorized examiners  
  - Gudrun Massmann
  - Luise Dorothee Giani
  - Cord Peppler-Lisbach
  - Gerfried Caspers

- Module counseling  
  - Luise Dorothee Giani
  - Gudrun Massmann

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**  
German, English

**Duration (semesters)**  
1 Semester

**Module frequency**

**Module capacity**  
15

**Module level**  
---

**Module type**  
je nach Studiengang Pflicht oder Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**

<table>
<thead>
<tr>
<th>Time of examination</th>
<th>Type of examination</th>
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<tbody>
<tr>
<td>PS</td>
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</table>

**Final exam of module**

<table>
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<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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</thead>
<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
</tr>
<tr>
<td>Study trip</td>
<td></td>
<td>2.00</td>
<td>SuSe and WiSe</td>
<td>28 h</td>
</tr>
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</table>

**Total time of attendance for the module**  
56 h
lök229 - Ecology of the Soil-Water-Plant-System

Module label
Ecology of the Soil-Water-Plant-System

Module code
lök229

Credit points
9.0 KP

Workload
270 h

Used in course of study
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

Contact person
Module responsibility
- Gudrun Massmann

Authorized examiners
- Gudrun Massmann
- Luise Dorothee Giani
- Gerfried Caspers
- Cord Peppler-Lisbach

Module counseling
- Luise Dorothee Giani
- Gudrun Massmann

Entry requirements

Skills to be acquired in this module

Module contents

Reader's advisory

Links

Languages of instruction
German, English

Duration (semesters)
1 Semester

Module frequency

Module capacity
8

Modullevel
---

Modulart
je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination
Time of examination
Type of examination

Final exam of module
HA

Course type
Comment
SWS
Frequency
Workload attendance

Seminar
4.00
SuSe and WiSe
56 h

Exercises
2.00
SuSe and WiSe
28 h

Total time of attendance for the module
84 h
Iök230 - Aquatic Ecology

Module label: Aquatic Ecology
Module code: Iök230
Credit points: 9.0 KP
Workload: 270 h
Used in course of study: Master Landschaftsökologie > Vertiefungsmodul zweites Fachsemester

Contact person:
- Ellen Kiel

Authorized examiners:
- Ellen Kiel

Entry requirements:
Skills to be acquired in this module:
The prior goals and themes of this module are:
- To learn about important parameter and ecological processes of specific aquatic habitats;
- learn about threats and important disturbance factors;
- work independently on scientific question;
- learn methods and learn how to apply specific methods in field and in the laboratory experiments;
- start to development methods on your own;
- analyse the field and laboratory data, and apply modern statistical methods;
- start critical analysis and discussion of field and laboratory data;
- learn to develop mapping and assessment methods;
- study principles of typology and models describing selected systems;
- learn how to deal with nature conservation conflicts by referring to experimental field and laboratory data.

Module contents:
3 courses:
1. Lowland Waters (3 CP); 2. Bioassessment (3 CP); 3. Field Experiments (3 CP)

Reader's advisory:
Relevant literature will be made available in advance via StudIP and during the course.

Links:

Languages of instruction:
German, English

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
20

Modullevel:
MM (Mastermodul)

Modulart:
Wahlpflicht

Lern-/Lehrform / Type of program:
V/S/Ü

Vorkenntnisse / Previous knowledge:

Examination:

Time of examination: Before the end of the module
Type of examination: 1 assignment (English, publication form)

Course type:

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2.00</td>
<td>SuSe</td>
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<td>Exercises</td>
<td>2.00</td>
<td>SuSe</td>
<td>28 h</td>
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</tr>
<tr>
<td>Seminar</td>
<td>2.00</td>
<td>SuSe</td>
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</table>

Total time of attendance for the module: 84 h
**Module code**  lök240

**Credit points**  15.0 KP

**Workload**  450 h

**Used in course of study**  
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

**Contact person**

- Module responsibility
  - Michael Kleyer
- Authorized examiners
  - Michael Kleyer

**Entry requirements**

**Skills to be acquired in this module**

Upon successful completion of the module students will gain:

- Technical skills in ecological field experiments, determination of plants in the field, phytosociological records, soil inventories, biomass determination and determination of biological characteristics
- Technical skills in laboratory work, statistics
- Skills in mapping plants and animals, application of GIS, spatial statistics
- Advanced knowledge of spatial ecology and the conditions of survival in heterogeneous landscapes as well as knowledge of functional ecology; assessment of academic voids between theory and empiricism
- Skills in independently dealing with ecological literature and information, respectively

**Module contents**

- Practical training in the field and in the laboratory, practical training in statistics
- Functional ecology of communities in spatio-temporally heterogeneous landscapes: Literature analyses
- Functional plant ecology: Biological characteristics related to disturbances and soil resources (laboratory analyses, statistical analysis)

**Reader's advisory**

Literature will be announced during the preparatory course and is contingent on the latest developments in the research field.

**Links**

https://www.uni-oldenburg.de/en/landeco/

**Language of instruction**  English

**Duration (semesters)**  1 Semester

**Module frequency**  jährlich

**Module capacity**  unlimited

**Modullevel**  MM (Mastermodul)

**Modulart**  Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
</table>
| Final exam of module |                     | a) Seminar paper (weighting 20 %)  
b) Specialized practical exercise (weighting 80 %) |

**Course type**

<table>
<thead>
<tr>
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<th>Comment</th>
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<th>Frequency</th>
<th>Workload attendance</th>
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<tr>
<td>Exercises</td>
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<td>8.00</td>
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<td>112 h</td>
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<tr>
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<td>28 h</td>
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</table>

**Total time of attendance for the module**  140 h
lök250 - Functional Ecology of Plants

Module label: Functional Ecology of Plants
Module code: lök250
Credit points: 15.0 KP
Workload: 450 h

Used in course of study: Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

Contact person
Module responsibility
- Gerhard Wolfgang Zotz
 Authorized examiners
- Gerhard Wolfgang Zotz
- Helena Einzmann
- Vincent Hoeber
- Maria Will

Entry requirements: none

Skills to be acquired in this module: Lecture: Special subjects of Functional Ecology of Plants are dealt with in detail giving the students a general idea of recent research in the field. Seminar: Giving seminar papers based on own or other people’s research allows the improvement of presentation skills. Practical work: Project work including independent planning, performance, analysis, and presentation will familiarize students with the scientific method.

Module contents: L: "Scaling": Physiological Ecology from individual organ to ecosystem
SE: Recent studies in experimental ecology
E: Independent research project


Additional literature will be announced during the module and is contingent on the latest developments in the research field.


Language of instruction: English

Duration (semesters): 1 Semester

Module capacity: unlimited

Reference text: http://www.uni-oldenburg.de/fun_eco/

Modullevel: MM (Mastermodul)
Modulart: Wahlpflicht

Vorkenntnisse / Previous knowledge

Examination Time of examination Type of examination
Final exam of module Two seminar papers (30%) Project report (70%)

Course type Comment SWS Frequency Workload attendance
Lecture 2.00 28 h
Exercises 10.00 140 h
Seminar 2.00 28 h

Total time of attendance for the module 196 h
**Module Label:** Restoration of Terrestrial Ecosystems  
**Module Code:** lök260  
**Credit Points:** 6.0 KP  
**Workload:** 180 h  
**Used in course of study:** Master Landschaftsökologie > Vertiefungsmodul zweites Fachsemester  
**Contact Person:**  
- Module responsibility: Rainer Buchwald  
- Authorized examiners: Rainer Buchwald  

### Entry Requirements
Basic knowledge in Ecology, Vegetation Science, and Zoology, comparable to the respective Bachelor modules in Environmental Sciences.

### Skills to be Acquired in This Module
The participants will become acquainted with the possibilities and limits of renaturation and restoration projects in terrestrial ecosystems. This implies an extensive knowledge in autecology and population ecology of selected species on the one hand; on the other hand, monitoring by means of hydrological and/or pedological parameters as well as based on the vegetation and selected animal groups is crucial for evaluating such projects. In cooperation with the respective project management, student groups will contribute to the evaluation and advancement of the respective project as well as similar project(s) by performing individual records, analyses and assessments.

### Module Contents
- **Theory and Practice of Restoration Ecology (L):** The lecture deals with the fundamentals of Restoration Ecology and exemplarily with the biotope systems fen and bog, grassland and heath.
- **Restoration of Terrestrial Ecosystems (LC):** The participants collect data contributing to the evaluation of current restoration projects (Hudewald, mesophilic grassland, heath, oligotrophic stagnant waters).

### Reader’s Advisory

### Additional Literature
Additional literature will be announced during the course, if necessary.

### Links
- Language of instruction: English
- Duration (semesters): 1 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Modullevel: MM (Mastermodul)
- Modulart: Wahlpflicht

### Examination / Previous knowledge
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<th>Type of examination</th>
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<tr>
<td>Final exam of module</td>
<td>Before the end of the module</td>
<td>Seminar paper or assignment</td>
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### Course Type
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<th>Frequency</th>
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<tr>
<td>Exercises</td>
<td>2.00</td>
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<td>28 h</td>
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<tr>
<td>Seminar</td>
<td></td>
<td>0</td>
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<td>0 h</td>
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### Total Time of Attendance for the Module
56 h
**lök270 - Landscape Management Support Planning**

**Module label**
Landscape Management Support Planning

**Module code**
lök270

**Credit points**
15.0 KP

**Workload**
450 h

**Used in course of study**
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

**Contact person**
Module responsibility
- Michael Kleyer

**Authorized examiners**
- Michael Kleyer

**Entry requirements**

**Skills to be acquired in this module**
The landscape management support plan aims at compensating for any project-related impacts on the environment. The mitigation and compensation plan is the outcome of a planning process which will be trained in this course.

Upon successful completion of the module students will gain:
- Technical skills in mapping plants and animals in landscapes: Records, sorting of records for preparing mapping keys; field mapping.
- Technical skills in landscape management support planning including GIS analysis, evaluation of the compensation of environmental impacts on selected ecosystem compartments, and planning of compensation and mitigation

**Module contents**
Mapping results obtained in the field study are fed into GIS, compensation and mitigation measures are planned, and finally the impacts are balanced by the compensation measures.

**Reader's advisory**
Relevant literature will be announced during the preparatory course and is contingent on the latest developments in the research field. Additionally, a script for the exercise will be handed over to the participants.

**Links**
https://www.uni-oldenburg.de/en/landeco/

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Modullevel**
MM (Mastermodul)

**Modulart**
Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

<table>
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<th>Type of examination</th>
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<td>Before the end of the module</td>
<td>Specialized practical exercise</td>
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<table>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises</td>
<td>10.00</td>
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<td>140 h</td>
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<tr>
<td>Seminar</td>
<td>1.00</td>
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<td>SuSe and WiSe</td>
<td>14 h</td>
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**Total time of attendance for the module**
154 h
# lök280 - Special Vegetation Ecology

**Module label**  
Special Vegetation Ecology

**Module code**  
lök280

**Credit points**  
6.0 KP

**Workload**  
180 h

**Used in course of study**  
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

**Contact person**  
Module responsibility
- Rainer Buchwald
- Cord Peppler-Lisbach

Authorized examiners
- Rainer Buchwald
- Cord Peppler-Lisbach

Module counselling
- Rainer Buchwald

**Entry requirements**  
Completed Bachelor studies with ecological orientation

**Skills to be acquired in this module**  
The module qualifies the participants to extend their knowledge acquired in their ecologically oriented Master studies of Landscape Ecology. This comprises advanced knowledge of the flora and vegetation types in Central Europe as well as the acquisition of additional methods in vegetation ecology.

**Module contents**  
In the summer term, the module (6 CP) includes a one-week field course in a selected Central European natural landscape focussing on floristic, vegetation ecological, phytosociological (syntaxonomical) aspects as well as on aspects of biocoenology and nature conservation.

**Reader’s advisory**  

**Links**  
- Language of instruction: German
- Duration (semesters): 2 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Reference text: The field course in this module is also part of the 9CP module lök285 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.

**Module level**  
MM (Mastermodul)

**Module type**  
Wahlpflicht

**Vorkenntnisse / Previous knowledge**  
- Time of examination: Before the end of the module
- Type of examination: Assignment

**Course type**  
Exercises

**SWS**  
4.00

**Frequency**  
56 h
Module code: lök285  
Credit points: 9.0 KP  
Workload: 270 h

Entry course of study:  
- Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester

Contact person:
- Module responsibility:
  - Rainer Buchwald
  - Cord Peppler-Lisbach
- Authorized examiners:
  - Rainer Buchwald
  - Cord Peppler-Lisbach
- Module counseling:
  - Rainer Buchwald

Entry requirements:
Completed Bachelor studies with ecological orientation

Skills to be acquired in this module:
The module qualifies the participants to extend their knowledge acquired in their ecologically oriented Master studies of Landscape Ecology. This comprises advanced knowledge of the flora and vegetation types in Central Europe as well as the acquisition of additional methods in vegetation ecology.

Module contents:
Exercise:
In the summer term, the module includes, as a compulsory component (6 CP), a one-week field work in a selected Central European natural landscape focussing on floristic, vegetation ecological, phytosociological (syntaxonomical) aspects as well as on aspects of biocenology and nature conservation.

Lecture:
Additionally, the lecture "Vegetation Ecology" (3 CP) is offered in the winter term, imparting the fundamentals of development, dynamics, dispersal, site conditions, floristic composition as well as protection of decisive Central European vegetation and biotope types, respectively.

Reader's advisory:

Links:
- Language of instruction: German
- Duration (semesters): 2 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Reference text: The field work is also part of the 6 CP module lök280 “Special Vegetation Ecology”. Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.

Modulelevel: MM (Mastermodul)
Modulart: Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:
- Time of examination: Before the end of the module
- Type of examination: Oral examination or assignment

Course type:  
- Lecture: 2.00  
- Exercises: 4.00

Frequency:  
- Lecture: 28 h
- Exercises: 56 h

Workload attendance:  
- Total time of attendance for the module: 84 h
**lök290 - Perspectives of Bioenergy**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Perspectives of Bioenergy</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök290</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
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</table>

- **Used in course of study**
  - Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
  - Master Water and Coastal Management > Bereich Science

**Contact person**

- **Module responsibility**
  - Rainer Buchwald
- **Authorized examiners**
  - Rainer Buchwald
  - Luise Dorothee Giani
  - Megan de Jager
  - Thomas Klenke
  - Michael Wark
  - Kai Michael Röhrdanz

- **Module counseling**
  - Luise Dorothee Giani
  - Thomas Klenke
  - Michael Wark

**Entry requirements**

Bachelor studies of Natural Science, Environmental Science or Economics

**Skills to be acquired in this module**

The module qualifies students to deal with the different forms of bioenergy and their current perspectives. Hereby, they acquire competences in the scientific basal subjects of physics, chemistry, and biology as well as with respect to the energetic, technical, ecological, and economic aspects that have to be considered for a synoptic assessment of different forms of bioenergy.

**Module contents**

**Reader's advisory**

**Links**

**Languages of instruction**

- German, English

**Duration (semesters)**

1 Semester

**Module frequency**

jährlich

**Module capacity**

unlimited

**Modullevel**

MM (Mastermodul)

**Modulart**

Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**

- Time of examination: Before the end of the module
- Type of examination: Assignment (for the seminar or for the exercise, alternatively) and presentation of 30 min. for a) not marked

**Course type**

<table>
<thead>
<tr>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
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<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
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**Total time of attendance for the module**

84 h
**Vertiefungsmodule drittes Fachsemester**

**lök310 - Group Project: Sustainable Spatial Development**

<table>
<thead>
<tr>
<th>Module label</th>
<th>Group Project: Sustainable Spatial Development</th>
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<tbody>
<tr>
<td>Module code</td>
<td>lök310</td>
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<tr>
<td>Credit points</td>
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<tr>
<td>Workload</td>
<td>270 h</td>
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<tr>
<td>Used in course of study</td>
<td>• Master Landschaftsökologie &gt; Vertiefungsmodule drittes Fachsemester</td>
</tr>
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**Contact person**
- Module responsibility
  - Ingo Mose
- Authorized examiners
  - Ingo Mose
  - Peter Schaal
- Module counseling
  - Peter Schaal

**Entry requirements**
- Participation in the module Environmental Planning

**Skills to be acquired in this module**
- Upon successful completion of the module the students will have gained various skills in the independent use and application of planning methods to develop appropriate solutions to selected problems in spatial planning and regional development, additionally experiences will be gained in organizing group work and the successful integration of individual tasks in a wider project context.

**Module contents**
- Review of theoretical knowledge in spatial and environmental planning based on a specific planning task reflecting or integrating practical requirements.

**Reader's advisory**
- Literature will be announced during the lectures.

**Links**
- Language of instruction: German
- Duration (semesters): 1 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Modullevel: MM (Mastermodul)
- Modulart: Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**
- Time of examination: Before the end of the module
- Type of examination: Project paper including presentation

**Course type**
- Project group

**SWS**
- 6.00

**Frequency**

**Workload attendance**
- 84 h
### iök320 - Sustainable Spatial Development in Europe

<table>
<thead>
<tr>
<th>Module label</th>
<th>Sustainable Spatial Development in Europe</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök320</td>
</tr>
<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
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**Used in course of study**
- Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
- Master Sustainability Economics and Management > Ergänzungsmodul
- Master Water and Coastal Management > Bereich Planning

**Contact person**
- Module responsibility
  - Ingo Mose
- Authorized examiners
  - Ingo Mose
  - Thomas Klenke
  - Markus Prinz
  - Peter Schaal
- Module counseling
  - Ingo Mose

**Entry requirements**
- Good command of English

**Skills to be acquired in this module**
- Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context.
- Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.

**Module contents**
- **SE/EX Multifunctionality and rural development (3 CP)**
- **V Topical issues of agriculture and nutrition (1.5 CP)**
- **SE/EX Sustainable tourism (3 CP)**
- **SE/EX Renewable energy planning (3 CP)**
- **V Colloquium on sustainable spatial development (1.5 CP)**
- **SE Special subject job market: Job market and inequality in Europe (3 CP)** – This course (1.07.211 / FK I) takes place in the summer semester.

**Multifunctionality and rural development**
- Survey of the multifunctionality of rural areas, especially the importance of agriculture and forestry, tourism and recreational activities, habitation, and protection of nature as well as the demands on spatial planning and regional development involved under the conditions of sustainability. Illustration by means of selected examples in a European context.

**Agriculture and agricultural policy**
- Survey of EU agricultural policy programmes and their strategic-instrumental implementation as well as of selected topics of current developments in agriculture presented by various guest lecturers.

**Sustainable tourism**
- Presentation of various concepts of sustainable tourism and its realization from the viewpoint of offer and demand. Illustration by means of selected examples in a European context.

**Renewable energy planning**
- Survey of different forms of renewable energy and related demands on spatial development seen from a mainly planning and actor-oriented point of view. Illustration by means of selected examples in a European context.

**Colloquium on sustainable spatial development**
- Survey of up-to-date theoretical approaches, concepts, instruments as well as practical fields of activities in sustainable spatial development in a national and European context.

**Special subject job market: Job market and inequality**
- This course (1.07.211 / FK I) takes place in the summer semester.
- Three one-day excursions with varying emphasis will be performed in the vicinity of Oldenburg as an integral part of the module seminars.

**Reader's advisory**
- Schmied, D. (ed.): Winning and losing. The changing geography of Europe’s rural areas.
Additional literature will be announced in the seminars.

<table>
<thead>
<tr>
<th>Links</th>
<th><a href="https://www.uni-oldenburg.de/en/geo/">https://www.uni-oldenburg.de/en/geo/</a></th>
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<td>Languages of instruction</td>
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</tr>
<tr>
<td>Module frequency</td>
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</tr>
<tr>
<td>Module capacity</td>
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<tr>
<td>Modullevel</td>
<td>MM (Mastermodul / Master module)</td>
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<tr>
<td>Modulart</td>
<td>Wahlpflicht / Elective</td>
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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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<th>Time of examination</th>
<th>Type of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
<td>Before the end of the module</td>
<td>6 CP – Report or assignment</td>
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<table>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
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<tr>
<td>Lecture</td>
<td>2.00</td>
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<td>28 h</td>
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<tr>
<td>Seminar</td>
<td>6.00</td>
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<td>84 h</td>
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<td>28 h</td>
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**Total time of attendance for the module**

140 h
### iök321 - Sustainable Spatial Development in Europe

**Module label**  
Sustainable Spatial Development in Europe

**Module code**  
iök321

**Credit points**  
9.0 KP

**Workload**  
270 h

**Used in course of study**  
- Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester

**Contact person**

- Module responsibility
  - Ingo Mose
- Authorized examiners
  - Ingo Mose
  - Thomas Klenke
  - Markus Prinz
  - Peter Schaal

**Entry requirements**  
Good command of English

**Skills to be acquired in this module**

- Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context.
- Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.

**Module contents**

- **SE/EX Multifunctionality and rural development** (3 CP)  
  Survey of the multifunctionality of rural areas, especially the importance of agriculture and forestry, tourism and recreational activities, habitation, and protection of nature as well as the demands on spatial planning and regional development involved under the conditions of sustainability. Illustration by means of selected examples in a European context.

- **V Topical issues of agriculture and agricultural policy** (1.5 CP)
- **SE/EX Sustainable tourism** (3 CP)
- **SE/EX Renewable energy planning** (3 CP)
- **V Colloquium on sustainable spatial development** (1.5 CP)
  - This course (1.07.211 / FK I) takes place in the summer semester.

- **Multifunctionality and rural development**
  - Survey of the multifunctionality of rural areas, especially the importance of agriculture and forestry, tourism and recreational activities, habitation, and protection of nature as well as the demands on spatial planning and regional development involved under the conditions of sustainability. Illustration by means of selected examples in a European context.

- **Agriculture and agricultural policy**
  - Survey of EU agricultural policy programmes and their strategic-instrumental implementation as well as of selected topics of current developments in agriculture presented by various guest lecturers.

- **Sustainable tourism**
  - Presentation of various concepts of sustainable tourism and its realization from the viewpoint of offer and demand. Illustration by means of selected examples in a European context.

- **Renewable energy planning**
  - Survey of different forms of renewable energy and related demands on spatial development seen from a mainly planning and actor-orientated point of view. Illustration by means of selected examples in a European context.

- **Colloquium on sustainable spatial development**
  - Survey of up-to-date theoretical approaches, concepts, instruments as well as practical fields of activities in sustainable spatial development in a national and European context.

- **Special subject job market: Job market and inequality**
  - This course (1.07.211 / FK I) takes place in the summer semester.
  - Three one-day excursions with varying emphasis will be performed in the vicinity of Oldenburg as an integral part of the module seminars.

**Reader's advisory**

Schmied, D. (ed.): Winning and losing. The changing geography of Europe’s rural areas.
Additional literature will be announced in the seminars.

**Links**

https://www.uni-oldenburg.de/en/geo/

**Languages of instruction**

German, English

**Duration (semesters)**

1 Semester

**Module frequency**

jährlich

**Module capacity**

unlimited

**Modullevel**

MM (Mastermodul)

**Modulart**

Wahlpflicht
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<th>Vorkenntnisse / Previous knowledge</th>
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<th>Time of examination</th>
<th>Type of examination</th>
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<td>Seminar</td>
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**Total time of attendance for the module**: 140 h
Iök345 - Advanced Limnology

Module label: Advanced Limnology

Module code: Iök345

Credit points: 6.0 KP

Workload: 180 h

Used in course of study:
- Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester

Contact person:

Module responsibility
- Rolf Niedringhaus
- Ellen Kiel

Authorized examiners
- Rolf Niedringhaus
- Ellen Kiel

Module counseling
- Rolf Niedringhaus

Entry requirements:
Basic knowledge of taxonomy + determination of mainly invertebrates, basic skills in faunistic field methods, L Animal Ecology

Skills to be acquired in this module:
Special Aquatic Ecology

The module imparts general and special knowledge of the ecology of typical floodplain water systems with special emphasis on floodplain dynamics and the resulting processes related to those water systems. Floodplain development and (faunistic) biodiversity are further main topics comprising e.g. the explanation of ecological conditions and colonisation processes and referring to questions of nature protection, examining the habitat preference of selected species and describing the population development of typical floodplain species.

E Special Aquatic Ecology

Familiarization with the course of a planning process on the basis of an exemplary project in Northwest Germany; independent development of a concept of methods for assessing the faunistic actual state and subsequent realization in the field; scientific documentation and ecologically relevant assessment of the situation in the project area using selected indicator groups (scientific determination of selected taxa); preparation of final expert opinions on the project

Module contents:

L Special Aquatic Ecology

Ecology of typical floodplain water systems (mainly oxbow lakes bodies and temporary water bodies); description of the decisive processes in floodplain and water system dynamics as well as the express-sivit of the (faunistic) biodiversity; description of the ecological conditions and colonisation processes relevant to questions of nature protection, aspects of biodiversity as well as habitat preference and population development of typical floodplain species.

E Special Aquatic Ecology

Description of legal and planning procedures based on a case study; development and realization of a concept of methods for assessing the faunistic current status; scientific documentation (determination of taxa), analysis (determination and classification of species-related characteristics of the taxa relevant to the planning) and ecologically relevant assessment of the situation in the project area; final expert opinion on the project

Reader's advisory:
See announcements in StudIP

Links:

Languages of instruction:
German, English

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
unlimited

Reference text:
The courses of this module are integrated into Iök350 "Special Animal Ecology" (9 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.

Modullevel:
MM (Mastermodul)

Modulart:
Wahlpflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:
Type of examination
- Time of examination
- Special exercise or Assignment

Final exam of module:
Before the end of the module.
- Course type
- Comment
- SWS
- Frequency
- Workload attendance

- Lecture
  - 1.00
  - 14 h

- Exercises
  - 3.00
  - 42 h

Languages of instruction:
German, English

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
unlimited

Reference text:
The courses of this module are integrated into Iök350 "Special Animal Ecology" (9 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.

Modullevel:
MM (Mastermodul)

Modulart:
Wahlpflicht
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**lök350 - Advanced Animal Ecology**

**Module label**  
Advanced Animal Ecology

**Module code**  
lök350

**Credit points**  
9.0 KP

**Workload**  
270 h

**Used in course of study**  
- Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester

**Contact person**

- **Module responsibility**
  - Rolf Niedringhaus
  - Ellen Kiel

- **Authorized examiners**
  - Ellen Kiel
  - Rolf Niedringhaus

- **Module counseling**
  - Ellen Kiel

**Entry requirements**
Basic knowledge of taxonomy + determination of mainly vertebrates, basic skills in faunistic field methods, L Animal Ecology

**Skills to be acquired in this module**

**L Special Aquatic Ecology**
The module imparts general and special knowledge of the ecology of typical floodplain water systems with special emphasis on floodplain dynamics and the resulting processes related to those water systems. Floodplain development and (faunistic) biodiversity are further main topics comprising e.g. the explanation of ecological conditions and colonisation processes and referring to questions of nature protection, examining the habitat preference of selected species and describing the population development of typical floodplain species.

**E Special Aquatic Ecology**
Familiarization with the course of a planning process on the basis of an exemplary project in North-west Germany; independent development of a concept of methods for assessing the faunistic actual state and subsequent realization in the field; scientific documentation and ecologically relevant assessment of the situation in the project area using selected indicator groups (scientific determination of selected taxa); preparation of final expert opinions on the project

**L Applied Animal Ecology**
Qualification for preparing a professional zooecological contribution within the scope of an expert opinion; familiarization with the most important faunistic indicator groups for scientific objectives relevant to a project

**Module contents**

**L Special Aquatic Ecology**
Ecology of typical floodplain water systems (mainly old water bodies and temporary water bodies); decription of the decisive processes in floodplain and water system dynamics as well as the expressivity of the (faunistic) biodiversity; description of the ecological conditions and colonisation processes relevant to questions of nature protection, aspects of biodiversity as well as habitat preference and population development of typical floodplain species.

**E Special Aquatic Ecology**
Description of legal and planning procedures based on a case study; development and realization of a concept of methods for assessing the faunistic current status; scientific documentation (determination of taxa), analysis (determination and classification of species-related characteristics of the taxa relevant to the planning) and ecologically relevant assessment of the situation in the project area; final expert opinion on the project

**L Applied Animal Ecology**
Importance of professional zooecological contributions within the scope of ecologically relevant planning; legal and qualified arguments; regulations for the conservation of species under national and international law; faunistic indication: complex of problems related to vicarious species, well-founded selection of indicator groups; Principles of developing a concept of sampling and of performing field work; description of standard methods of sampling and analysis, essential aspects of a professional zooecological contribution for an expert opinion on a project; detailed description of the most important faunistic indicator groups for scientific objectives relevant to a project

**Reader's advisory**
See announcements in StudIP

**Links**

**Languages of instruction**
German, English

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Reference text**
Special Animal Ecology (9 CP) integrates the courses of the module Special Aquatic Ecology (6 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.

**Modullevel**
MM (Mastermodul)
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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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<td>Special exercise or Assignment</td>
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**Total time of attendance for the module**

84 h
### lök360 - Special Abiotic Factors (Soil/Water)

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</tr>
<tr>
<td></td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Luise Dorothee Giani</td>
</tr>
<tr>
<td></td>
<td>• Janek Greskowiak</td>
</tr>
<tr>
<td></td>
<td>• Birte Junge</td>
</tr>
<tr>
<td></td>
<td>• Gudrun Massmann</td>
</tr>
<tr>
<td>Authorized examiners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Luise Dorothee Giani</td>
</tr>
<tr>
<td></td>
<td>• Janek Greskowiak</td>
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<td>• Birte Junge</td>
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<td>• Gudrun Massmann</td>
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<td>Module counseling</td>
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</tr>
<tr>
<td></td>
<td>• Luise Dorothee Giani</td>
</tr>
<tr>
<td></td>
<td>• Gudrun Massmann</td>
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</table>

#### 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.

**E**: Hydrochemical modelling of water-rock interactions using 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


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](http://www.fao.org/3/a-i3794e.pdf)
- see also announcements in StudIP

#### Links

- [www.simcore.com](http://www.simcore.com)
- [www.fao.org/3/a-i3794e.pdf](http://www.fao.org/3/a-i3794e.pdf)

#### Languages of instruction

German, English
<table>
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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type**

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**Total time of attendance for the module**

|                          | 140 h        |
lök365 - Special Abiotic Factors (Soil/Water)

Module label  Special Abiotic Factors (Soil/Water)
Module code  lök365
Credit points  9.0 KP
Workload  270 h

Used in course of study  • Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester

Contact person

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:
  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, reduct reactions, ion exchange, equilibrium reactions and reaction kinetics) using
  the software PHREEQC (http://www.brr.cr.usgs.gov/projects/GWC_coupled/phreeqc/)

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 transfer in groundwater:
  Performance of a box core experiment. Numerical modelling of groundwater currents and solute transfer
  using PMWIN (http://www.simcore.com): Model setup, parameterization and numerical solution of groundwater
  current 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 substances, redox reactions, ion exchange, balance reactions and reaction kinetics) using
  the software PHREEQC (http://www.brr.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

  Borntraeger Berlin.

  Heidelberg, 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.

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<td>Module frequency</td>
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<td>Vorkenntnis / Previous knowledge</td>
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<td>Oral examination or housework</td>
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<td>5.00</td>
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| Total time of attendance for the module | 140 h |
## Module: lök370 - Ornithology

**Module label**: Ornithology  
**Module code**: lök370  
**Credit points**: 6.0 KP  
**Workload**: 180 h  
**Used in course of study**: Master Landschaftsökologie > Vertiefungsmodul drittes Fachsemester

### Contact person
- **Module responsibility**: Franz Bairlein, Georg Martin Klump
- **Authorized examiners**: Franz Bairlein, Sandra Bouwhuis, Georg Martin Klump, Christine Köppl, Ulrike Langemann, Henrik Mouritsen, Heiko Schmaljohann
- **Module counseling**: Franz Bairlein, Georg Martin Klump

### Entry requirements
**Skills to be acquired in this module**: The module imparts advanced knowledge on different aspects of ornithology. The students acquire:
- An extended knowledge of morphological and physiological fundamentals and the resulting ecological and behaviour-biological consequences in birds
- Knowledge, presentation and discussion of relevant English literature from various fields of ornithology

### Module contents
Lecture "Ecology and Physiology of Birds": This lecture consolidates special aspects of systematics, morphology, physiology, migration, orientation, population biology, communication and behavioural ecology in birds.

### Reader's advisory

### Links
- **Languages of instruction**: German, English
- **Duration (semesters)**: 1 Semester
- **Module capacity**: 30
- **Modullevel**: MM (Mastermodul / Master module)
- **Modulart**: Wahlpflicht / Elective
- **Lern-/Lehrform / Type of program**: V
- **Vorkenntnisse / Previous knowledge**: Time of examination: Written exam in the last week of the term  
  Type of examination: Written examination
- **Course type**: Lecture
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**lök375 - Advanced Ornithology**

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<td></td>
<td>- Franz Bairlein</td>
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<td></td>
<td>- Franz Bairlein</td>
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<tr>
<td></td>
<td>- Georg Martin Klump</td>
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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

<table>
<thead>
<tr>
<th>Languages of instruction</th>
<th>German, English</th>
</tr>
</thead>
</table>

**Duration (semesters)**

| 1 Semester |

**Module frequency**

| --- |

**Module capacity**

| 12 |

**Modullevel**

| --- |

**Modulart**

| je nach Studiengang Pflicht oder Wahlpflicht |

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

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td></td>
<td>PT</td>
</tr>
</tbody>
</table>

**Course type**

| Practical |

**SWS**

| 4.00 |

**Frequency**

| SuSe or WiSe |

**Workload attendance**

| 56 h |
lök390 - Experimental designs in ecological field studies

<table>
<thead>
<tr>
<th>Module label</th>
<th>Experimental designs in ecological field studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module code</td>
<td>lök390</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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<tr>
<td>Used in course of study</td>
<td>• Master Landschaftsökologie &gt; Vertiefungsmodule drittes Fachsemester</td>
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<tr>
<td>Contact person</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>• Ellen Kiel</td>
</tr>
<tr>
<td></td>
<td>• Ines Wolpmann</td>
</tr>
<tr>
<td>Authorized examiners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ellen Kiel</td>
</tr>
<tr>
<td></td>
<td>• Ines Wolpmann</td>
</tr>
<tr>
<td>Module counseling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ellen Kiel</td>
</tr>
</tbody>
</table>

Entry requirements

- Basic courses of Ecology (1st and 2nd semesters LÖK)
- Skills in determining aquatic organisms, e.g. via Bachelor modules
  - Knowledge of forms
  - Running water ecology
  - Aquatic habitats
  - Master course in the module “Aquatic Ecology”
  - Comparable courses at other universities

Skills to be acquired in this module

- Qualification to independently plan field experiments suitable for answering current ecological questions (individuals, populations, communities)
- Methodological competence/independence in performing field experiments
- Qualification to independently analyse the experiments in the laboratory guided by hypotheses and using adequate methods, materials and statistical methods
- Competence in presenting results on a scientific level (scientific report presenting and discussing the method; scientific publication; both in English)
- Impartment of manifold methodological skills in the field of aquatic ecology, experimental field research (autecological, population-ecological and synecological research approaches)
- Impartment of extended expertise in planning experiments in general and their analysis in the field of animal ecology (application and linking of acquired skills; generalisable knowledge)
- Practical experience in analysing field experiments in general (comprising laboratory phases, access to literature and databases, preparation of scientific publications)
- Preparation of Master and Ph.D. theses requiring skills in experimental field research

Module contents

1st course phase (theoretical preparation and planning)
- Picking up current ecological research topics related to aquatic habitats, e.g. in streams and ditches (the respective system is selected prior to the start of the course and should change)
- Specification of questions and frame conditions by the course lecturer concerning current research questions in the fields of autecology, population ecology, and synecology
- Instructions for literature research and the respective analysis by students
- Summary and presentation of the current standard of knowledge (structured brief reviews presented to the course participants by students and commented by the lecturer as well as preparation of a synopsis as part of the term paper or the oral examination (see below))
- Concrete formulation of questions and working hypotheses based on literature research

2nd course phase (practical preparation and planning; laboratory and field work)
- Preparatory inspection of the investigation area accompanied by the lecturer
- Independent development of a concept of methods (advised by the lecturer)
- Presentation of the planned experiment and of the analysis (treatment of samples, data processing etc.)
- Independent practical preparation of experiments (calibrate equipment, prepare solutions, prepare trapping jars, determine aquatic data etc.), analysis steps (e.g. prepare laboratory equipment), and logistics (transportation, entry permissions etc.)
- Description of methods for all working steps in writing
- Independent realization of planning (advised by lecturer)
- Report on all procedures including reflection

3rd course phase (further development and application of acquired knowledge; theoretical phase)
- Common discussion about the possibilities of and limits to applying the procedure to concrete questions concerning other habitats, other animal associations etc.

Reader's advisory

Methods in Ecology and Evolution (British Ecological Society):
http://www.methodsinecologyandevolution.org/view/0/index.html
TIEE: http://www.esa.org/tee/misc/about.html

Additional scientific publications and materials with examples of relevant research work will be made available via StudIP as an E-reserve of reference literature prior to the start of the course.
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Language of instruction</td>
<td>English</td>
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<tr>
<td>Duration (semesters)</td>
<td>2 Semester</td>
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<tr>
<td>Module frequency</td>
<td>jährlich</td>
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<tr>
<td>Module capacity</td>
<td>unlimited</td>
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<tr>
<td>Reference text</td>
<td>Independent literature research on specific questions and methods by students.</td>
</tr>
<tr>
<td>Modullevel</td>
<td>MM (Mastermodul)</td>
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<tr>
<td>Modulart</td>
<td>Wahlpflicht</td>
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</table>

<table>
<thead>
<tr>
<th>Lern-Lehrform / Type of program</th>
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<tbody>
<tr>
<td>Vorkenntnisse / Previous knowledge</td>
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<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>as agreed</td>
<td>Oral examination or housework</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1) oral or written presentation of the method design</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) documentation of experimental procedure, data analysis and data processing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3) oral or written subject-specific analysis of the planning in respect of the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>relevant questions and elaborated hypotheses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) interdisciplinary analysis of the experiments (oral or in writing)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td></td>
<td>1.00</td>
<td></td>
<td>14 h</td>
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<tr>
<td>Exercises</td>
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<td>3.00</td>
<td></td>
<td>42 h</td>
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</table>

| Total time of attendance for the module                                | 56 h     |


# Abschlussmodul

**mam - Master´s Degree Module**

<table>
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<tr>
<th>Module label</th>
<th>Master’s Degree Module</th>
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<tr>
<td>Module code</td>
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<tr>
<td>Credit points</td>
<td>30.0 KP</td>
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<tr>
<td>Workload</td>
<td>900 h</td>
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<td>Used in course of study</td>
<td>Master Landschaftsökologie &gt; Abschlussmodul</td>
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</table>

**Contact person**

- Lehrende der Landschaftsoekologie
- Authorized examiners
  - Lehrende der Landschaftsoekologie

**Entry requirements**

**Skills to be acquired in this module**

Successful completion of the Master module demonstrates that students are able to work on a problem in the field of Landscape Ecology within a fixed period applying scientific methods.

**Module contents**

- E: Preparing the Master thesis
- SE: Active participation in the seminar of the research group, in which the Master thesis is written.

**Reader’s advisory**

Supervisors may supply an initial reading list with important literature. The students are expected to find and use further literature as needed.

**Links**

- Languages of instruction
- Duration (semesters) 1 Semester
- Module frequency semiannual
- Module capacity unlimited
- Modul level ---
- Modulart je nach Studiengang Pflicht oder Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
</table>
| Final exam of module | | Master's Thesis (80%)
| | | Oral examination (20%)

**Course type**

- Seminar

**SWS**

2.00

**Frequency**

**Workload attendance**

28 h