## Basismodule

**lök100 - Data Modelling**

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<th>Data Modelling</th>
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<tr>
<td>Credit points</td>
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<td>Workload</td>
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<tr>
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<td>Master Landschaftsökologie &gt; Basismodule</td>
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</table>

### Contact person

- Module responsibility
  - Vanessa Minden
- Authorized examiners
  - Vanessa Minden
  - Cord Peppler-Lisbach
- Module counselling
  - Vanessa Minden

### Entry requirements

- 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>
<th><strong>Reader's advisory</strong></th>
<th>Crawley, M.J. (2007): The R Book. 942 S. Wiley &amp; Sons, Chichester. Additional literature will be announced during the course.</th>
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<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>
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<td><strong>Duration (semesters)</strong></td>
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<td>Wahlpflicht / Elective</td>
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lök110 - Ecology

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<td>▪ Master Landschaftsökologie &gt; Basismodule</td>
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**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

**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**

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**lök120 - Geoeconomic Processes**

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<td></td>
<td>Luise Dorothee Giani</td>
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<td>Authorized examiners</td>
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<td></td>
<td>Holger Freund</td>
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<td>Luise Dorothee Giani</td>
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<td>Gudrun Massmann</td>
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</table>

**Entry requirements**

Skills to be acquired in this module: 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 unit Spiekeroog (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

Modulelevel: MM (Mastermodul / Master module)

Modulart: Wahlpflicht / Elective

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

**Vorkenntnisse / Previous knowledge**

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

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| Used in course of study | Master Landschaftsökologie > Basismodule  
                      | Master Sustainability Economics and Management > Ergänzungsmodul |

**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**

- 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.

**Ranking and position of the module within the course of studies:**

The module offers fundamental and advanced knowledge in the first semester on the basis of which planning exercises can be performed during the Master courses.

**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/](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
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| SWS | 6.00 |
| Frequency |
| Workload attendance | 84 h |
**lök140 - Applied GIS Methods in Landscape Ecology**

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<td>Christian Aden</td>
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**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

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<td><strong>Module capacity</strong></td>
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**Lern-Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type**

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<tr>
<td>4.00</td>
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**Geospatial Datamanagement and Geostatistical Analysis**

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<td>Peter Schaal</td>
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**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** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

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**Course type**

| SWS | 4.00 |
| Frequency | SuSe or WiSe |

**Workload attendance**

56 h
Vertiefungsmodule zweites Fachsemester

lök210 - Practice of Nature Conservation

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<td>Master Water and Coastal Management &gt; Bereich Science</td>
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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) 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

je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

Examination

Time of examination

Type of examination
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<td>Final exam of module</td>
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<td>6 CP – Paper (in the course of a seminar) or excursion report or assignment</td>
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<td>Seminar</td>
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**Total time of attendance for the module**: 98 h
Iök211 - Practice of Nature Conservation

Module label: Practice of Nature Conservation
Module code: Iök211
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Master Landschaftsökologie > Vertiefungsmodul 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
Final exam of module: 9 CP – graded oral examination (Mose/Buchwald), additionally active participation in both seminars

Course type: Comment: Frequency: Workload attendance:
Lecture: 1.00 14 h
<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>Exercises</td>
<td></td>
<td>1.00</td>
<td></td>
<td>14 h</td>
</tr>
<tr>
<td>Seminar</td>
<td></td>
<td>2.00</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Study trip</td>
<td></td>
<td>3.00</td>
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**Total time of attendance for the module** 98 h
# lök225 - Ecology of the Soil-Water-Plant-System

<table>
<thead>
<tr>
<th><strong>Module label</strong></th>
<th>Ecology of the Soil-Water-Plant-System</th>
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<tbody>
<tr>
<td><strong>Module code</strong></td>
<td>lök225</td>
</tr>
<tr>
<td><strong>Credit points</strong></td>
<td>6.0 KP</td>
</tr>
<tr>
<td><strong>Workload</strong></td>
<td>180 h</td>
</tr>
<tr>
<td><strong>Used in course of study</strong></td>
<td>Master Landschaftsökologie &gt; Vertiefungsmodule zweites Fachsemester</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
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<th>German, English</th>
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### Duration (semesters)

<table>
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### Module frequency

### Module capacity

<table>
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### Module level

### Modulart

<table>
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<th>je nach Studiengang Pflicht oder Wahlpflicht</th>
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</table>

### 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></td>
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</table>

### Final exam of module

<table>
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<th>Course type</th>
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<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>
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### Total time of attendance for the module

<table>
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**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**

<table>
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<th>Type of examination</th>
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**Course type**

<table>
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<tbody>
<tr>
<td>Seminar</td>
<td></td>
<td>4.00</td>
<td>SuSe and WiSe</td>
<td>56 h</td>
</tr>
<tr>
<td>Exercises</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**  
84 h
**Module label**
Aquatic Ecology

**Module code**
lök230

**Credit points**
9.0 KP

**Workload**
270 h

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

**Contact person**
Module responsibility
- 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**

<table>
<thead>
<tr>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the end of the module</td>
<td>1 assignment (English, publication form)</td>
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**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>
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<td>SuSe</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td>2.00</td>
<td>SuSe</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Seminar</td>
<td>2.00</td>
<td>SuSe</td>
<td></td>
<td>28 h</td>
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**Total time of attendance for the module**
84 h
**lök240 - Functional ecology of communities in heterogeneous landscapes**

**Module label**  
Functional ecology of communities in heterogeneous landscapes

**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

**Ranking/position of the module within the course of studies:**
The module imparts action-oriented and theoretical knowledge of the conditions of survival in plant and animal species in heterogeneous landscapes. It serves the prognosis of impacts on the biodiversity caused by environmental changes. This represents a crucial qualification for environmental planning and habitat restitution projects.

**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)

**Modular**

Wahlpflicht

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

S/Ü

**Vorkenntnisse / Previous knowledge**

**Examination**

<table>
<thead>
<tr>
<th>Time of examination</th>
<th>Type of examination</th>
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</thead>
<tbody>
<tr>
<td>a) Seminar paper (weighting 20 %)</td>
<td></td>
</tr>
<tr>
<td>b) Specialized practical exercise (weighting 80 %)</td>
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**Course type**  
- Exercises  
- Seminar

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<tbody>
<tr>
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<td>2.00</td>
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**Total time of attendance for the module**

140 h
**Iök250 - Functional Ecology of Plants**

<table>
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<th>Module label</th>
<th>Functional Ecology of Plants</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>Iök250</td>
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<tr>
<td>Credit points</td>
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<tr>
<td>Workload</td>
<td>450 h</td>
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<tr>
<td>Used in course of study</td>
<td>• Master Landschaftsökologie &gt; Vertiefungsmodule zweites Fachsemester</td>
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</tbody>
</table>
| 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

**Reader's advisory**


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

**Links**


**Language of instruction**

English

**Duration (semesters)**

1 Semester

**Module frequency**

jährlich

**Module capacity**

unlimited

**Reference text**

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

**Modullevel**

MM (Mastermodul)

**Modulart**

Wahlpflicht

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

V/S/PR

**Vorkenntnisse / Previous knowledge**


<table>
<thead>
<tr>
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<th>Type of examination</th>
</tr>
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<tbody>
<tr>
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<td>Project report (70%)</td>
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**Course type**

<table>
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<th>Frequency</th>
<th>Workload attendance</th>
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</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2.00</td>
<td>28 h</td>
<td></td>
</tr>
<tr>
<td>Exercises</td>
<td>10.00</td>
<td>140 h</td>
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<tr>
<td>Seminar</td>
<td>2.00</td>
<td>28 h</td>
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**Total time of attendance for the module**

196 h
**lök260 - Restoration of Terrestrial Ecosystems**

**Module label**  
Restoration of Terrestrial Ecosystems

**Module code**  
lök260

**Credit points**  
6.0 KP

**Workload**  
180 h

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

**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  
Seminar paper or assignment

**Course type**  
Comment  
SWS  
Frequency  
Workload attendance

- Lecture  
  2.00  
  28 h

- Exercises  
  2.00  
  28 h

- Seminar  
  0 h

**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 > Vertiefungsmodul 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**

**Examination**  
- Time of examination:  
- Type of examination: 

**Final exam of module**  
- Before the end of the module  
- Specialized practical exercise

<table>
<thead>
<tr>
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<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Exercises</td>
<td></td>
<td>10.00</td>
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<td>140 h</td>
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<tr>
<td>Seminar</td>
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<td>1.00</td>
<td>SuSe and WiSe</td>
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**Total time of attendance for the module**: 154 h
**Iök280 - Special Vegetation Ecology**

<table>
<thead>
<tr>
<th><strong>Module label</strong></th>
<th>Special Vegetation Ecology</th>
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<tbody>
<tr>
<td><strong>Module code</strong></td>
<td>Iök280</td>
</tr>
<tr>
<td><strong>Credit points</strong></td>
<td>6.0 KP</td>
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<tr>
<td><strong>Workload</strong></td>
<td>180 h</td>
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<td><strong>Used in course of study</strong></td>
<td>Master Landschaftsökologie &gt; Vertiefungsmodul zweites Fachsemester</td>
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</table>

**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**
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 Iök285 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules Iök280 and Iök285 simultaneously.
- Module level: MM (Mastermodul)
- Module type: Wahlpflicht

**Lern-/Lehrform / Type of program**
- Vorkenntnisse / Previous knowledge
- Examination: Time of examination: Before the end of the module; Type of examination: Assignment
- Course type: Exercises
- SWS: 4.00
- Frequency: Workload attendance: 56 h
**Iök285 - Special Vegetation Ecology**

<table>
<thead>
<tr>
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<th>Special Vegetation Ecology</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>Iök285</td>
</tr>
<tr>
<td>Credit points</td>
<td>9.0 KP</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>
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**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 Iök280 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules Iök280 and Iök285 simultaneously.

**Modullevel**

- MM (Mastermodul)

**Modulart**

- Wahlpflicht

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

<table>
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<tr>
<th>Examination</th>
<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>Oral examination or assignment</td>
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</table>

**Course type**

<table>
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<tr>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>2.00</td>
<td></td>
<td>28 h</td>
</tr>
<tr>
<td>Exercises</td>
<td>4.00</td>
<td></td>
<td>56 h</td>
</tr>
</tbody>
</table>

**Total time of attendance for the module**

- 84 h
### iök290 - Perspectives of Bioenergy

**Module label**: Perspectives of Bioenergy  
**Module code**: iök290  
**Credit points**: 6.0 KP  
**Workload**: 180 h

**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

**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: Assignment (for the seminar or for the exercise, alternatively) and presentation of 30 min. for a) not marked

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tr>
<td>Exercises</td>
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<td>Seminar</td>
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**Total time of attendance for the module**: 84 h
### Vertiefungsmodul drittes Fachsemester

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

<table>
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<tr>
<th><strong>Module label</strong></th>
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<tbody>
<tr>
<td><strong>Module code</strong></td>
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<tr>
<td><strong>Credit points</strong></td>
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<td><strong>Workload</strong></td>
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</table>
  - Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester |
| **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
- **Modulelevel**: MM (Mastermodul)
- **Modulart**: Wahlpflicht
- **Lern-/Lehrform / Type of program**: P

**Vorkenntnisse / Previous knowledge**

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<td>Before the end of the module</td>
<td>Project paper including presentation</td>
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**Course type**

- Project group

**SWS**

- 6.00

**Frequency**

**Workload attendance**

- 84 h
**lök320 - Sustainable Spatial Development in Europe**

<table>
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<tr>
<td>Module code</td>
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<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. |
Schmied, D. (ed.): Winning and losing. The changing geography of Europe’s rural areas. |
Additional literature will be announced in the seminars.

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<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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Lern-/Lehrform / Type of program

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Course type

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<th>Workload attendance</th>
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Total time of attendance for the module

| 140 h |
Module label | Sustainable Spatial Development in Europe
---|---
Module code | lök321
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)
- 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)
- 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-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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<td>Type of examination</td>
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<td>Seminar</td>
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**lök345 - Advanced Limnology**

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<tr>
<td>Module responsibility</td>
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</tr>
<tr>
<td></td>
<td>• Rolf Niedringhaus</td>
</tr>
<tr>
<td></td>
<td>• Ellen Kiel</td>
</tr>
<tr>
<td>Authorized examiners</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rolf Niedringhaus</td>
</tr>
<tr>
<td></td>
<td>• Ellen Kiel</td>
</tr>
<tr>
<td>Module counseling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Rolf Niedringhaus</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Basic knowledge of taxonomy + determination of mainly invertebrates, basic skills in faunistic field methods, L Animal Ecology</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>Special Aquatic Ecology</td>
</tr>
<tr>
<td>Module contents</td>
<td>L Special Aquatic Ecology</td>
</tr>
<tr>
<td></td>
<td>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 expres-sivity of the (faunistic) biodiversity; description of the 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.</td>
</tr>
<tr>
<td></td>
<td>E Special Aquatic Ecology</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td>Reader's advisory</td>
<td>See announcements in StudIP</td>
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<tr>
<td>Languages of instruction</td>
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<td>The courses of this module are integrated into lök350 &quot;Special Animal Ecology&quot; (9 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.</td>
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**Vorkenntnisse / Previous knowledge**

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<tr>
<td>Final exam of module</td>
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<td>Special exercise or Assignment</td>
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<td>Course type</td>
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<tr>
<td>Lecture</td>
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<td>Exercises</td>
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## lök350 - Advanced Animal Ecology

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### 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); description of the decisive processes in floodplain and water system dynamics as well as the expressively 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 actual state; scientific documentation (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.

### Module level

- MM (Mastermodul)
<table>
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<th>Wahlpflicht</th>
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**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

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**Course type** | **Comment** | **SWS** | **Frequency** | **Workload attendance**
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**Total time of attendance for the module** 84 h
**Iök360 - Special Abiotic Factors (Soil/Water)**

<table>
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**Contact person**

- Luise Dorothee Giani
- Janek Greskowiak
- Birte Junge
- 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:** 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**


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
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<tr>
<td>Vorkenntnisse / Previous knowledge</td>
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<td>Oral examination or housework</td>
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| Total time of attendance for the module | 140 h |
Iök365 - Special Abiotic Factors (Soil/Water)

Module label: Special Abiotic Factors (Soil/Water)
Module code: Iök365
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 Greskowski
  - Birte Junge
  - Gudrun Massmann

Authorized examiners:
- Luise Dorothee Giani
- Janek Greskowski
- 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:

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):
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 substance transfer in ground water:

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://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:

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**

<table>
<thead>
<tr>
<th>Final exam of module</th>
<th>Time of examination</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>Before the end of the module</td>
<td>Oral examination or housework</td>
</tr>
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**Course type**

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>5.00</td>
<td></td>
<td></td>
<td>70 h</td>
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| Exercises | 5.00 | 70 h |

**Total time of attendance for the module**

140 h
# Iök370 - Ornithology

<table>
<thead>
<tr>
<th>Module label</th>
<th>Ornithology</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
<td>Iök370</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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<tr>
<td>Used in course of study</td>
<td>Master Landschaftsökologie &gt; Vertiefungsmodul drittes Fachsemester</td>
</tr>
</tbody>
</table>

## 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

- 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 frequency: 30
- Modullevel: MM (Mastermodul / Master module)
- Modulart: Wahlpflicht / Elective
- Lern-/Lehrform / Type of program: V
- Vorkenntnisse / Previous knowledge:
  - Examination: Time of examination
  - Final exam of module: Written exam in the last week of the term
  - Course type: Lecture
  - Type of examination: Written examination
<table>
<thead>
<tr>
<th>SWS</th>
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<tbody>
<tr>
<td>Frequency</td>
<td>SuSe or WiSe</td>
</tr>
<tr>
<td>Workload attendance</td>
<td>56 h</td>
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**lök375 - Advanced Ornithology**

<table>
<thead>
<tr>
<th><strong>Module label</strong></th>
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<tbody>
<tr>
<td><strong>Module code</strong></td>
<td>lök375</td>
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<tr>
<td><strong>Credit points</strong></td>
<td>6.0 KP</td>
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<tr>
<td><strong>Workload</strong></td>
<td>180 h</td>
</tr>
<tr>
<td><strong>Used in course of study</strong></td>
<td>Master Landschaftsökologie &gt; Vertiefungsmodule drittes Fachsemester</td>
</tr>
</tbody>
</table>

**Contact person**

- Module responsibility
  - Franz Bairlein
  - Georg Martin Klump
- Authorized examiners
  - Franz Bairlein
  - Sandra Bouwhuis
  - Georg Martin Klump
  - Ulrike Langemann
  - Heiko Schmaljohann
- Module counseling
  - Franz Bairlein
  - Georg Martin Klump

**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** 12

**Modullevel** ---

**Modulart** je nach Studiengang Pflicht oder Wahlpflicht

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

**Vorkenntnisse / Previous knowledge**

**Examination**

<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>
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</table>

**Course type** Practical

**SWS** 4.00

**Frequency** SuSe or WiSe

**Workload attendance** 56 h
### Module Information

**Module label**  
Experimental designs in ecological field studies

**Module code**  
lök390

**Credit points**  
6.0 KP

**Workload**  
180 h

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

### Contact person

- **Module responsibility**
  - Ellen Kiel
  - Ines Wolpmann

- **Authorized examiners**
  - Ellen Kiel
  - Ines Wolpmann

### Module Counseling

- Ellen Kiel

### 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

- TIEE: http://www.esa.org/tiee/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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<td>Duration (semesters)</td>
<td>2 Semester</td>
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<td>Module frequency</td>
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<td>Module capacity</td>
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<tr>
<td>Reference text</td>
<td>Independent literature research on specific questions and methods by students.</td>
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<tr>
<td>Modullevel</td>
<td>MM (Mastermodul)</td>
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<tr>
<td>Modulart</td>
<td>Wahlpflicht</td>
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**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>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>
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<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 relevant questions and elaborated hypotheses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4) interdisciplinary analysis of the experiments (oral or in writing)</td>
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<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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<tr>
<td>Lecture</td>
<td></td>
<td>1.00</td>
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<tr>
<td>Exercises</td>
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<td>3.00</td>
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<td>42 h</td>
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**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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<tbody>
<tr>
<td>Module code</td>
<td>mam</td>
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<tr>
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<td>Master Landschaftsökologie &gt; Abschlussmodul</td>
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<tr>
<td>Contact person</td>
<td>Module responsibility</td>
</tr>
<tr>
<td></td>
<td>Lehrende der Landschaftsökologie</td>
</tr>
<tr>
<td></td>
<td>Authorized examiners</td>
</tr>
<tr>
<td></td>
<td>Lehrende der Landschaftsökologie</td>
</tr>
</tbody>
</table>

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

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>Master's Thesis (80%) Oral examination (20%)</td>
</tr>
<tr>
<td>Course type</td>
<td>Seminar</td>
<td></td>
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SWS 2.00

Frequency

Workload attendance 28 h