

## Modules for Landscape Ecology

Date 16/09/19

# Basismodule

## lök100 - Data Modelling

<b>Module label</b>	Data Modelling
<b>Module code</b>	lök100
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>Vanessa Minden</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>Vanessa Minden</li> <li>Cord Pepler-Lisbach</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>Vanessa Minden</li> </ul>

### 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
- Chi<sup>2</sup> 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 (Pepler-Lisbach)

Classification:

- Cluster analysis
- Statistical degrees of fidelity

Ordination:

- Indirect procedures: PCA, CA, DCA
- Canonical procedures: RDA, CCA

<b>Literaturempfehlungen</b>	Crawley, M.J. (2007): The R Book. 942 S. Wiley & Sons, Chichester. Additional literature will be announced during the course.	
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a>	
<b>Language of instruction</b>	German	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	unlimited	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>		
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the course	Assignment
<b>Course type</b>	Exercises	
<b>SWS</b>	6.00	
<b>Frequency</b>	WiSe	
<b>Workload attendance</b>	84 h	

## lök110 - Ecology

<b>Module label</b>	Ecology	
<b>Module code</b>	lök110	
<b>Credit points</b>	6.0 KP	
<b>Workload</b>	180 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Michael Kleyer</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Michael Kleyer</li> <li>◦ Gerhard Wolfgang Zotz</li> <li>◦ Ellen Kiel</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Gerhard Wolfgang Zotz</li> <li>◦ Ellen Kiel</li> <li>◦ Michael Kleyer</li> </ul>	
<b>Entry requirements</b>	Knowledge of phytosociology, zoo-ecology, pedology and ecology, comparable to the corresponding modules of BSc. Environmental Sciences	
<b>Skills to be acquired in this module</b>	<p>Qualification imparted to students: Upon successful completion of the module the students will gain:</p> <ul style="list-style-type: none"> <li>• a thorough knowledge of environmental conditions and biological mechanisms enabling plant species to survive in landscapes</li> <li>• a thorough knowledge of the eco-physiology of plants in landscapes</li> <li>• a thorough knowledge of the environmental conditions and biological mechanisms enabling animals to survive in landscapes</li> </ul> <p>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.</p>	
<b>Module contents</b>	<p>Ecology of plants in landscapes Eco-physiology of plants in landscapes Ecology of animals in landscapes</p>	
<b>Literatureempfehlungen</b>	Literature will be announced during the course.	
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a>	
<b>Language of instruction</b>	German	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	unlimited	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>		
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the module	<ul style="list-style-type: none"> <li>a) Written examination (33 %)</li> <li>b) Written examination (33 %)</li> <li>c) Written examination (33 %)</li> </ul>
<b>Course type</b>	Lecture	
<b>SWS</b>	3.00	
<b>Frequency</b>		
<b>Workload attendance</b>	42 h	

## lök120 - Geoecological Processes

<b>Module label</b>	Geoecological Processes			
<b>Module code</b>	lök120			
<b>Credit points</b>	6.0 KP			
<b>Workload</b>	180 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Holger Freund</li> <li>◦ Luise Dorothee Giani</li> <li>◦ Gudrun Massmann</li> </ul>			
<b>Entry requirements</b>				
<b>Skills to be acquired in this module</b>	<p>Upon successful completion of the module the students will gain:</p> <ul style="list-style-type: none"> <li>- advanced skills in analysing a landscape unit</li> <li>- a thorough knowledge of geological, pedological, hydrological, hydrogeological, and botanical relationships within an ecosystem</li> <li>- a thorough knowledge of the genesis and properties of Northwest German soils</li> <li>- a thorough knowledge of hydrological and hydrogeological properties of Northwest Germany</li> <li>- a fundamental knowledge of national and international soil systematics</li> <li>- the qualification to ecologically record and assess soils (including humus form)</li> <li>- the ability to perform soil ecological interpretations</li> </ul>			
<b>Module contents</b>	<p>Landscape unit Spiekerooog (EX/E)  Special Pedology (L)  Special Hydrogeology (L)  Pedological field work (E)</p>			
<b>Literaturempfehlungen</b>	Literature will be announced during the lecture.			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/bodenkunde/">https://www.uni-oldenburg.de/bodenkunde/</a>			
<b>Language of instruction</b>	German			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	30			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>	V, Ü/EX			
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Before the end of the module		Written examination	
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises (mit Exkursion)		2.00	WiSe	28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>56 h</b>

## lök130 - Environmental Planning

<b>Module label</b>	Environmental Planning
<b>Module code</b>	lök130
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> <li>• Master's Programme Sustainability Economics and Management (Master) &gt; Additional Modules</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal Prüfungsberechtigt</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Peter Schaal</li> <li>◦ Thomas Lecke-Lopatta</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> </ul>
<b>Entry requirements</b>	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.
<b>Skills to be acquired in this module</b>	<p>The students will</p> <ul style="list-style-type: none"> <li>• gain advanced knowledge into the formal and informal organization of spatial developmental processes in a combination of disciplinary and interdisciplinary concepts;</li> <li>• 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;</li> <li>• elaborate case studies and typical planning problems in seminar papers and develop their own positions regarding the instruments;</li> <li>• get to know assessment methods for all important ecosystem compartments and gain the skills to deduce ecosystem services from ecosystem functions.</li> </ul> <p>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</p>
<b>Module contents</b>	<p>a) Development of models and assessment of ecosystem functions for environmental planning: Presentation of theoretical concepts and practicable methods applied to assess ecosystem functions</p> <p>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</p> <p>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</p> <p>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.</p>
<b>Literaturempfehlungen</b>	<p>Akademie für Raumforschung und Landesplanung (ed.): Handwörterbuch der Raumordnung, Hannover 1995. Benz, A.: Governance. Regieren in komplexen Regelsystemen. Eine Einführung. 2nd edition. Wiesbaden 2010. Grundwasserbewirtschaftungsplan Hessisches Ried. Darmstadt 1999. Moseley, M.J. (Ed.): Local Partnerships for Rural Development. The European Experience. Cambridge 2003. Pütz, M.; Buchholz, K.-H. (2003): Anzeige- und Genehmigungsverfahren nach dem Bundes-Immissionsschutzgesetz. 7th edition. Berlin. Wikipedia: <a href="http://de.wikipedia.org/wiki/Fachplanung">http://de.wikipedia.org/wiki/Fachplanung</a> Additional literature will be announced during the lectures.</p>
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a>
<b>Language of instruction</b>	German
<b>Duration (semesters)</b>	1 Semester
<b>Module frequency</b>	jährlich
<b>Module capacity</b>	unlimited
<b>Modullevel</b>	MM (Mastermodul / Master module)
<b>Modulart</b>	Wahlpflicht / Elective

**Lern-/Lehrform / Type of program** a) V/SE 2 SWS  
b) SE 2 SWS  
c) SE 2 SWS  
Gruppengröße entsprechend der Zulassungszahl

**Vorkenntnisse / Previous knowledge**

Examination	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the module	Seminar paper
<b>Course type</b>	Seminar	
<b>SWS</b>	6.00	
<b>Frequency</b>		
<b>Workload attendance</b>	84 h	

## Iök140 - Applied GIS Methods in Landscape Ecology

<b>Module label</b>	Applied GIS Methods in Landscape Ecology
<b>Module code</b>	Iök140
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> <li>◦ Christian Aden</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> <li>◦ Christian Aden</li> </ul>
<b>Entry requirements</b>	Grundlegende GIS-Kenntnisse (Basiswissen). Studierende, die diese im Bachelor-Studiengang nicht erhalten haben, wenden sich bitte an die Dozenten, die mit ihnen Möglichkeiten für das Nachholen der Kenntnisse festlegen.
<b>Skills to be acquired in this module</b>	<p>Vermittelte Qualifikation: Mit diesem Modul werden im Masterstudium Basiskompetenzen zur Analyse von raumbezogenen Daten und zur Modellierung von landschaftsökologischen Aufgabenstellungen ausgebildet. Die Kenntnisse sind sowohl im Bereich der Vektordatenanalyse als auch im Bereich der Rasterdatenanalyse angesiedelt und umfassen das Spektrum der Anwendungen der ArcGIS-Toolbox. Stellenwert/Verortung Modul im Studiengang Das Modul bietet im ersten Semester grundlegende und vertiefende Kenntnisse, auf denen das Master - Folgemodul „GIS Datenmanagement und geostatistische Analysen“ aufbaut.</p> <p>+ Erkennen und analysieren komplexer ökologischer Interdependenzen und Zusammenhänge im Rahmen eines landschaftsökologischen Systemverständnisses ++ Befähigung zum Transfer, d.h. Übertragen, Anpassen und Erweitern von erlerntem Wissen auf neue Problemstellungen und Kompetenz zur Problemlösung ++ Erlernen und selbständiges, zielgerichtetes Anwenden von Methoden-kenntnissen in wissenschaftlichen Forschungsarbeiten: Erfassungs-, Mess-, Auswertungs-, Modellierungs-, Bewertungs- und Planungsmethoden + Befähigung zur (auch englischsprachigen) fachlichen und fachübergreifenden Präsentation und Kommunikation von Arbeitsergebnissen gegenüber unterschiedlichen Adressatengruppen + Soziale und interkulturelle Kompetenz zur Zusammenarbeit in Teams unterschiedlicher Zusammensetzung ++ Verantwortungsvolles Anwenden der erlernten Kompetenzen, Fähigkeiten und Fertigkeiten in verschiedenen Feldern der landschaftsökologischen Berufspraxis</p>
<b>Module contents</b>	<p>a) Praktisches Arbeiten mit GIS (Ü) Die Studierenden erlernen die Entwicklung von Geodatenbanken sowie die Nutzung komplexerer geographischer Analysewerkzeuge im Bereich der Vektor- und Rasteranalyse.</p> <p>b) Analysen und Modelle (Se/Ü) Die Studierenden werden dazu befähigt, raumbezogene bzw. landschaftsökologische Fragestellungen anhand von komplexen GIS-Analysen (Erosionsmodelle, Routenplanung) zu beantworten und in die räumliche Modellierung von Daten einzusteigen.</p>
<b>Literaturempfehlungen</b>	<p>GI Geoinformatik GmbH (Hrsg.) ArcGIS 10.3: Das deutschsprachige Handbuch für ArcGIS for Desktop Basic und Standard mit Funktionen von ArcGIS Online für Desktopanwender– 2015 Law, Michael; Collins, Amy: Getting to Know ArcGIS (Englisch), 2015. Liebig, W.; Mumenthey, R.-D.: ArcGIS-ArcView. Band 2 ArcGIS-Analysen. Norden. 2005. Liebig, W.: ArcGIS-ArcView 9 - Personal Geodatabase. Norden. 2006. Bill, R.: Grundlagen der Geo-Informationssysteme. Band 2. Analysen, Anwendungen und neue Entwicklungen. 5. Aufl. Heidelberg. 2010. Albertz, J.: Einführung in die Fernerkundung. 3. Aufl. Darmstadt. 2007. Haverkamp, Wegener: Methodenentwicklung zur GIS-gestützten Modellierung des Landschaftswasserhaushaltes. Gießen. 2000. Berkhoff, K.: GIS-basierte Modellierung der Grundwasserempfindlichkeit in einer agrarischen Intensivregion. 2008.</p>
<b>Links</b>	
<b>Language of instruction</b>	German
<b>Duration (semesters)</b>	1 Semester

<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	30	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>	S, Ü	
<b>Vorkenntnisse / Previous knowledge</b>		
Examination	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Veranstaltungsende	Ü
<b>Course type</b>	Exercises	
<b>SWS</b>	4.00	
<b>Frequency</b>	SoSe oder WiSe	
<b>Workload attendance</b>	56 h	



## lök145 - Geospatial Datamanagement and Geostatistical Analysis

<b>Module label</b>	Geospatial Datamanagement and Geostatistical Analysis
<b>Module code</b>	lök145
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Basismodule</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> <li>◦ Christian Aden</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> </ul>
<b>Entry requirements</b>	Wer in seinem Bachelorstudium keine vertiefenden GIS-Kenntnisse erworben hat, sollte das vorlaufende Modul „GIS-Anwendungen in der Landschaftsökologie“ absolviert haben.
<b>Skills to be acquired in this module</b>	<p>Vermittelte Qualifikation:</p> <p>Basiswissen über die Ziele und Nutzen von Geodateninfrastrukturen und internationalen Standards für Geodaten und Geodatendienste</p> <p>Implementieren und Anwenden von Standards für die Publikation von Geodaten und Geodatendiensten (WMS, WPS, CSW)</p> <p>Einsatz von Geodatenbanken für das Management von Geodaten und deren Analyse</p> <p>Verwendung geostatistischer Verfahren und GIS-Analysen mittels GIS und Statistik-Software</p> <p>Stellenwert/Verortung Modul im Studiengang</p> <p>Das Modul baut auf dem vorlaufenden Master - Modul „GIS-Anwendungen in der Landschaftsökologie“ auf.</p> <p>++ An aktuellen Forschungsfragen orientierte sowie theoriegestützte Vertiefung von Grundlagenwissen sowie Aneignung von Detailwissen in den Einzeldisziplinen der Landschaftsökologie</p> <p>++ Erkennen und analysieren komplexer ökologischer Interdependenzen und Zusammenhänge im Rahmen eines landschaftsökologischen Systemverständnisses</p> <p>++ Befähigung zum Transfer, d.h. Übertragen, Anpassen und Erweitern von erlerntem Wissen auf neue Problemstellungen und Kompetenz zur Problemlösung</p> <p>++ Erlernen und selbständiges, zielgerichtetes Anwenden von Methoden-kenntnissen in wissenschaftlichen Forschungsarbeiten: Erfassungs-, Mess-, Auswertungs-, Modellierungs-, Bewertungs- und Planungsmethoden</p> <p>+ Befähigung zur (auch englischsprachigen) fachlichen und fachübergreifenden Präsentation und Kommunikation von Arbeitsergebnissen gegenüber unterschiedlichen Adressatengruppen</p> <p>+ Soziale und interkulturelle Kompetenz zur Zusammenarbeit in Teams unterschiedlicher Zusammensetzung</p> <p>++ Verantwortungsvolles Anwenden der erlernten Kompetenzen, Fähigkeiten und Fertigkeiten in verschiedenen Feldern der landschaftsökologischen Berufspraxis</p>
<b>Module contents</b>	<p>a) WebGIS und Datenmanagement (Ü)</p> <p>Einführung in Geodateninfrastrukturen, Web Mapping, WebGIS und internationale Standards</p> <p>Arbeiten mit (Geo-)Datenbanken für Vektor- und Rasterdaten</p> <p>Aufbereitung, Integration und Vorhaltung von Geodaten in verschiedenen Formaten und Geodatenbanken</p> <p>Gezielte Abfragen von Vektordaten und Einbindung von GIS-Analysen mit der Structured Query Language (SQL) und PostGIS-Funktionen</p> <p>Einsetzen von MapClients in Webseiten, Erfassen von Geodaten mit Hilfe von Formularen und digitalen Karten sowie Speicherung der Daten in Geodatenbanken</p> <p>Herstellen und Abbilden von Karten in MapClients und interoperablen GIS auf Basis von Standards des Open Geospatial Consortiums (OGC), einschl. Symbologie, Labels, Charts, Datenabfragen, ...</p> <p>b) Rasteranalysen und Geostatistik (Se/Ü)</p> <p>Geostatistische Verfahren und Herstellung von Rasterdaten</p>

Rastermanagement (Aufbereitung, Integration und Vorhaltung in Geodatenbanken, Export von Rasterformaten)

Verarbeitung und Analyse von Rasterdaten mit Hilfe von

- PostGIS (Rasterstatistiken und Manipulation)
- GRASS GIS (Surface-Analysen und Interpolationen analog zu ArcGIS)
- R for Statistics (Integration von Rasterdaten, Reklassifizieren, Clip/Mask, zonale Statistiken, Habitatmodellierung)
- Web Processing Services (Einbindung von Funktionen aus R und GRASS GIS in Python-Skripte, webbasierte Ansprachen von Funktionen unter Beachtung von Standards des Open Geospatial Consortiums (OGC))

#### Literaturempfehlungen

KORDUAN, P. & ZEHNER, M. L. (2008): Geoinformation im Internet. Technologien zur Nutzung raumbezogener Informationen im WWW. Wichmann, Heidelberg.  
 KRESSE, W. & FADAIE, K. (2004): ISO Standards for Geographic Information, Springer, Berlin.  
 MITCHELL, T. (2008): Web Mapping Illustrated: Using Open Source GIS Toolkits. O'Reilly, Sebastopol, CA.  
 PENG, Z.-R. & TSOU, M.-H. (2003): Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks, Wiley, Hoboken, NJ.  
 PEREZ, A. S. (2012): OpenLayers Cookbook. Packt Publishing.  
 OBE, R. O. & HSU, L. (2014): PostGIS in Action. Manning Publications.  
 FISCHER-STABEL, P. (2013): Umweltinformationssysteme: Grundlegende

#### Links

<b>Language of instruction</b>	German	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>		
<b>Module capacity</b>	30	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>	Ü	
<b>Vorkenntnisse / Previous knowledge</b>		
Examination	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Veranstaltungsende	Ü
<b>Course type</b>	Exercises	
<b>SWS</b>	4.00	
<b>Frequency</b>	SoSe oder WiSe	
<b>Workload attendance</b>	56 h	

## Vertiefungsmodule zweites Fachsemester

### lök210 - Practice of Nature Conservation

<b>Module label</b>	Practice of Nature Conservation	
<b>Module code</b>	lök210	
<b>Credit points</b>	6.0 KP	
<b>Workload</b>	180 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> <li>• Master's Programme Sustainability Economics and Management (Master) &gt; Additional Modules</li> <li>• Master's Programme Water and Coastal Management (Master) &gt; Science</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Ingo Mose</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Ingo Mose</li> <li>◦ Thomas Fartmann</li> <li>◦ Robert Sprenger</li> </ul>	
<b>Entry requirements</b>	Completed ecology-oriented Bachelor course	
<b>Skills to be acquired in this module</b>	<p>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.</p> <p>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.</p>	
<b>Module contents</b>	<p>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</p> <p>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. <b>this seminar takes place in the winter term</b></p> <p>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</p> <p>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</p>	
<b>Literatureempfehlungen</b>	<p>Amler, K. et al. (1999): Populationsbiologie in der Praxis. Stuttgart.</p> <p>Corbet, Ph. S. (1999): Dragonflies: Behaviour and ecology of Odonata. Chichester.</p> <p>Hammer, T. (ed., 2003): Großschutzgebiete - Instrumente nachhaltiger Entwicklung. München.</p> <p>Jedicke, E. (1990): Biotopverbund. Stuttgart.</p> <p>Jessel, B. &amp; K. Tobias (2002): Ökologisch orientierte Planung. Stuttgart.</p> <p>Köppel, J. et al. (1998): Praxis der Eingriffsregelung. Stuttgart.</p> <p>Mose, I. (ed., 2007): Protected areas and regional development in Europe. Aldershot.</p> <p>Sternberg, K. &amp; R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.</p>	
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>	
<b>Languages of instruction</b>	German, English	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	35	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>		
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination

Examination	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module	6 CP = Paper (in the course of a seminar) or excursion report or assignment		
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		1.00		14 h
Exercises		1.00		14 h
Seminar		2.00		28 h
Study trip		3.00		42 h
<b>Präsenzzeit Modul insgesamt</b>				<b>98 h</b>

## lök211 - Practice of Nature Conservation

<b>Module label</b>	Practice of Nature Conservation			
<b>Module code</b>	lök211			
<b>Credit points</b>	9.0 KP			
<b>Workload</b>	270 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Ingo Mose</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Ingo Mose</li> <li>◦ Thomas Fartmann</li> <li>◦ Robert Sprenger</li> </ul>			
<b>Entry requirements</b>	Completed ecology-oriented Bachelor course			
<b>Skills to be acquired in this module</b>	<p>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.</p> <p>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.</p>			
<b>Module contents</b>	<p>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</p> <p>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. <b>this seminar takes place in the winter term</b></p> <p>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</p> <p>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</p>			
<b>Literatureempfehlungen</b>	<p>Amler, K. et al. (1999): Populationsbiologie in der Praxis. Stuttgart.</p> <p>Corbet, Ph. S. (1999): Dragonflies: Behaviour and ecology of Odonata. Chichester.</p> <p>Hammer, T. (ed., 2003): Großschutzgebiete - Instrumente nachhaltiger Entwicklung. München.</p> <p>Jedicke, E. (1990): Biotopverbund. Stuttgart.</p> <p>Jessel, B. &amp; K. Tobias (2002): Ökologisch orientierte Planung. Stuttgart.</p> <p>Köppel, J. et al. (1998): Praxis der Eingriffsregelung. Stuttgart.</p> <p>Mose, I. (ed., 2007): Protected areas and regional development in Europe. Aldershot.</p> <p>Sternberg, K. &amp; R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.</p>			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>			
<b>Languages of instruction</b>	German, English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	35			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
<b>Examination</b>	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module	9 CP = graded oral examination (Mose/Buchwald), additionally active participation in both seminars		
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Lecture		1.00		14 h

Course type	Comment	SWS	Frequency	Workload attendance
Exercises		1.00		14 h
Seminar		2.00		28 h
Study trip		3.00		42 h
<b>Präsenzzeit Modul insgesamt</b>				<b>98 h</b>

## lök225 - Ecology of the Soil-Water-Plant-System

<b>Module label</b>	Ecology of the Soil-Water-Plant-System	
<b>Module code</b>	lök225	
<b>Credit points</b>	6.0 KP	
<b>Workload</b>	180 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Gudrun Massmann</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Gudrun Massmann</li> <li>◦ Luise Dorothee Giani</li> <li>◦ Cord Pepler-Lisbach</li> <li>◦ Gerfried Caspers</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Gudrun Massmann</li> </ul>	
<b>Entry requirements</b>		
<b>Skills to be acquired in this module</b>	<p>Ziel des Moduls ist es, den Studierenden ökosystemare Zusammenhänge im Moor aus pedologischer, hydrologischer und vegetationskundlicher Sicht zu vermitteln. Zu Beginn des Moduls werden die Grundlagen zur Moorökologie im Seminar vermittelt. In fünf eintägigen Exkursionen werden verschiedene Moore besucht und durch die Einbeziehung von externen Moorfachleuten unter verschiedensten Gesichtspunkten beleuchtet.</p> <p>Studierende besitzen nach erfolgreichem Besuch des Moduls</p> <ul style="list-style-type: none"> <li>• vertiefte theoretische Kenntnisse über das Ökosystem Moor</li> <li>• vertiefte bodenkundlich-hydrologische-vegetationsökologische Kenntnisse</li> <li>• vertiefte Kenntnisse ökosystemarer Prozessabläufe</li> <li>• vertiefte Kenntnisse bezüglich aktueller Forschungsthemen</li> </ul> <p>++ An aktuellen Forschungsfragen orientierte sowie theoriegestützte Vertiefung von Grundlagenwissen sowie Aneignung von Detailwissen in den Einzeldisziplinen der Landschaftsökologie</p> <p>++ Erkennen und analysieren komplexer ökologischer Interdependenzen und Zusammenhänge im Rahmen eines landschaftsökologischen Systemverständnisses</p> <p>++ Einordnung und Reflexion landschaftsökologischer Kenntnisse in inter-(und trans-)disziplinären Zusammenhängen</p> <p>+ Befähigung zum Transfer, d.h. Übertragen, Anpassen und Erweitern von erlerntem Wissen auf neue Problemstellungen und Kompetenz zur Problemlösung</p> <p>++ Erlernen und selbständiges, zielgerichtetes Anwenden von Methoden-kenntnissen in wissenschaftlichen Forschungsarbeiten: Erfassungs-, Mess-, Auswertungs-, Modellierungs-, Bewertungs- und Planungsmethoden</p> <p>++ Befähigung zur (auch englischsprachigen) fachlichen und fachübergreifenden Präsentation und Kommunikation von Arbeitsergebnissen gegenüber unterschiedlichen Adressatengruppen</p> <p>++ Soziale und interkulturelle Kompetenz zur Zusammenarbeit in Teams unterschiedlicher Zusammensetzung</p> <p>++ Verantwortungsvolles Anwenden der erlernten Kompetenzen, Fähigkeiten und Fertigkeiten in verschiedenen Feldern der landschaftsökologischen Berufspraxis</p>	
<b>Module contents</b>	<ul style="list-style-type: none"> <li>• Applied Peat Ecology (Ex)</li> <li>• Ecology of Peatlands (S)</li> </ul>	
<b>Literaturempfehlungen</b>	Literatur wird je nach Entwicklung des Forschungsfeldes im Rahmen der Vorbereitung zum Seminar bekannt gegeben.	
<b>Links</b>		
<b>Languages of instruction</b>	German, English	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	15	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>	S / Ex	
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Veranstaltungsende	PS

Course type	Comment	SWS	Frequency	Workload attendance
Seminar		2.00	SoSe und WiSe	28 h
Study trip		2.00	SoSe und WiSe	28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>56 h</b>



## lök229 - Ecology of the Soil-Water-Plant-System

<b>Module label</b>	Ecology of the Soil-Water-Plant-System
<b>Module code</b>	lök229
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Gudrun Massmann</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Gudrun Massmann</li> <li>◦ Luise Dorothee Giani</li> <li>◦ Gerfried Caspers</li> <li>◦ Cord Pepler-Lisbach</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Gudrun Massmann</li> </ul>
<b>Entry requirements</b>	
<b>Skills to be acquired in this module</b>	<p>Mit diesem Modul werden Kenntnisse zu Datenaufnahme, Probenanalyse und Dateninterpretation im System Boden-Wasser-Pflanze vermittelt. Geländearbeiten dienen der Analyse und Prognose der Auswirkungen von Umweltveränderungen auf die Wasser- und Stoffflüsse in Landschaften auf unterschiedlichen Skalen sowie der Hinführung zu vertiefender forschender Tätigkeit. Die erhobenen Felddaten bilden die Grundlage für die sich anschließenden Arbeiten im Labor und die Erstellung von Karten im GIS.</p> <p>Studierende besitzen nach erfolgreichem Besuch des Moduls</p> <ul style="list-style-type: none"> <li>• Handlungswissen über bodenkundlich-hydrologische-vegetationsökologische Feldaufnahmen</li> <li>• Vertiefte Kenntnisse in der Laboranalyse von Boden-, Pflanzen- und Wasserproben</li> <li>• vertiefte Kenntnisse ökosystemarer Prozessabläufe</li> <li>• vertiefte Kenntnisse bezüglich aktueller Forschungsthemen</li> <li>• vertiefte Kenntnisse in der Anwendung von GIS</li> </ul> <p>++ An aktuellen Forschungsfragen orientierte sowie theoriegestützte Vertiefung von Grundlagenwissen sowie Aneignung von Detailwissen in den Einzeldisziplinen der Landschaftsökologie          ++ Erkennen und analysieren komplexer ökologischer Interdependenzen und Zusammenhänge im Rahmen eines landschaftsökologischen Systemverständnisses          ++ Einordnung und Reflexion landschaftsökologischer Kenntnisse in inter-(und trans-)disziplinären Zusammenhängen          + Befähigung zum Transfer, d.h. Übertragen, Anpassen und Erweitern von erlerntem Wissen auf neue Problemstellungen und Kompetenz zur Problemlösung          ++ Erlernen und selbständiges, zielgerichtetes Anwenden von Methoden-kenntnissen in wissenschaftlichen Forschungsarbeiten: Erfassungs-, Mess-, Auswertungs-, Modellierungs-, Bewertungs- und Planungsmethoden          ++ Befähigung zur (auch englischsprachigen) fachlichen und fachübergreifenden Präsentation und Kommunikation von Arbeitsergebnissen gegenüber unterschiedlichen Adressatengruppen          ++ Soziale und interkulturelle Kompetenz zur Zusammenarbeit in Teams unterschiedlicher Zusammensetzung          ++ Verantwortungsvolles Anwenden der erlernten Kompetenzen, Fähigkeiten und Fertigkeiten in verschiedenen Feldern der landschaftsökologischen Berufspraxis</p>
<b>Module contents</b>	<ul style="list-style-type: none"> <li>• Field and laboratory work soil-water-plant system (Ü)</li> <li>• Interdisciplinary analysis of ecosystem processes and water and nutrient transport in landscapes (S)</li> </ul>
<b>Literatureempfehlungen</b>	Literatur wird je nach Entwicklung des Forschungsfeldes im Rahmen der Vorbereitung zum Seminar bekannt gegeben.
<b>Links</b>	
<b>Languages of instruction</b>	German, English
<b>Duration (semesters)</b>	1 Semester
<b>Module frequency</b>	jährlich
<b>Module capacity</b>	8
<b>Modullevel</b>	MM (Mastermodul / Master module)
<b>Modulart</b>	Wahlpflicht / Elective
<b>Lern-/Lehrform / Type of program</b>	Ü / S
<b>Vorkenntnisse / Previous knowledge</b>	

Examination	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Veranstaltungsende	HA		
Course type	Comment	SWS	Frequency	Workload attendance
Seminar		4.00	SoSe und WiSe	56 h
Exercises		2.00	SoSe und WiSe	28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>84 h</b>

## lök230 - Aquatic Ecology

<b>Module label</b>	Aquatic Ecology			
<b>Module code</b>	lök230			
<b>Credit points</b>	9.0 KP			
<b>Workload</b>	270 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodul zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	Module responsibility <ul style="list-style-type: none"> <li>◦ Ellen Kiel Prüfungsberechtigt</li> <li>◦ Ellen Kiel</li> </ul>			
<b>Entry requirements</b>	Gewässerökologische Grundkenntnisse (entsprechend den Angeboten B.Sc. UWI)			
<b>Skills to be acquired in this module</b>	The prior goals and themes of this module are: <ul style="list-style-type: none"> <li>- To learn about important parameter and ecological processes of specific aquatic habitats;</li> <li>- learn about threats and important disturbance factors;</li> <li>- work independently on scientific question;</li> <li>- learn methods and learn how to apply specific methods in field and in the laboratory experiments;</li> <li>- start to development methods on your own;</li> <li>- analyse the field and laboratory data, and apply modern statistical methods;</li> <li>- start critical analysis and discussion of field and laboratory data;</li> <li>- learn to develop mapping and assessment methods;</li> <li>- study principles of typology and models describing selected systems;</li> <li>- learn how to deal with nature conservation conflicts by referring to experimental field and laboratory data.</li> </ul>			
<b>Module contents</b>	3 courses: 1. Lowland Waters (3 CP); 2. Bioassessment (3 CP); 3. Field Experiments (3 CP)			
<b>Literatureempfehlungen</b>	Relevant literature will be made available in advance via StudIP and during the course.			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/">https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/</a>			
<b>Languages of instruction</b>	German, English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	20			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>	V, S, Ü			
<b>Vorkenntnisse / Previous knowledge</b>	Theorie u. Methoden der aquatischen Ökologie			
<b>Examination</b>	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module	1 assignment (English, publication form)		
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Lecture		2.00	SoSe	28 h
Exercises		2.00	SoSe	28 h
Seminar		2.00	SoSe	28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>84 h</b>

## lök240 - Functional ecology of communities in heterogeneous landscapes

<b>Module label</b>	Functional ecology of communities in heterogeneous landscapes			
<b>Module code</b>	lök240			
<b>Credit points</b>	15.0 KP			
<b>Workload</b>	450 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	Module responsibility <ul style="list-style-type: none"> <li>Michael Kleyer</li> </ul> Prüfungsberechtigt <ul style="list-style-type: none"> <li>Michael Kleyer</li> </ul>			
<b>Entry requirements</b>				
<b>Skills to be acquired in this module</b>	Upon successful completion of the module students will gain: <ul style="list-style-type: none"> <li>Technical skills in ecological field experiments, determination of plants in the field, phytosociological records, soil inventories, biomass determination and determination of biological characteristics</li> <li>Technical skills in laboratory work, statistics</li> <li>Skills in mapping plants and animals, application of GIS, spatial statistics</li> <li>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</li> <li>Skills in independently dealing with ecological literature and information, respectively</li> </ul> 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.			
<b>Module contents</b>	<ul style="list-style-type: none"> <li>Practical training in the field and in the laboratory, practical training in statistics</li> <li>Functional ecology of communities in spatio-temporally heterogeneous landscapes: Literature analyses</li> <li>Functional plant ecology: Biological characteristics related to disturbances and soil resources (laboratory analyses, statistical analysis)</li> </ul>			
<b>Literaturempfehlungen</b>	Literature will be announced during the preparatory course and is contingent on the latest developments in the research field.			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a>			
<b>Language of instruction</b>	English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
<b>Examination</b>	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Veranstaltungsende		a) Seminar paper (weighting 20 %) b) Specialized practical exercise (weighting 80 %)	
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Exercises		8.00		112 h
Seminar		2.00		28 h
<b>Präsenzzeit Modul insgesamt</b>				140 h

## lök250 - Functional Ecology of Plants

<b>Module label</b>	Functional Ecology of Plants			
<b>Module code</b>	lök250			
<b>Credit points</b>	15.0 KP			
<b>Workload</b>	450 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Gerhard Wolfgang Zotz</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Gerhard Wolfgang Zotz</li> <li>◦ Helena Einzmann</li> <li>◦ Vincent Hoerber</li> <li>◦ Maria Will</li> </ul>			
<b>Entry requirements</b>	none			
<b>Skills to be acquired in this module</b>	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.			
<b>Module contents</b>	L: "Scaling": Physiological Ecology from individual organ to ecosystem SE: Recent studies in experimental ecology E: Independent research project			
<b>Literatureempfehlungen</b>	<p>von Willert, D. J., R. Matyssek and W. Herppich (1995). Experimentelle Pflanzenökologie. Stuttgart, Thieme Verlag</p> <p>Lambers, H., F. S. Chapin III and T. L. Pons (2008). Plant Physiological Ecology. New York, Springer.</p> <p>Schulze, E. D., E. Beck and K. Müller-Hohenstein (2002). Pflanzenökologie. Berlin, Springer.</p> <p>Additional literature will be announced during the module and is contingent on the latest developments in the research field.</p>			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/biology/functional-ecology/">https://www.uni-oldenburg.de/en/biology/functional-ecology/</a>			
<b>Language of instruction</b>	English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	<a href="http://www.uni-oldenburg.de/fun_eco/">http://www.uni-oldenburg.de/fun_eco/</a>			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>			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
<b>Präsenzzeit Modul insgesamt</b>				196 h

## lök260 - Restoration of Terrestrial Ecosystems

<b>Module label</b>	Restoration of Terrestrial Ecosystems			
<b>Module code</b>	lök260			
<b>Credit points</b>	6.0 KP			
<b>Workload</b>	180 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> </ul>			
<b>Entry requirements</b>	Basic knowledge in Ecology, Vegetation Science, and Zoology, comparable to the respective Bachelor modules in Environmental Sciences			
<b>Skills to be acquired in this module</b>	<p>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.</p> <p>Ranking/position of the module within the course of studies: The module is closely related to the Master modules "Practice of Nature Conservation", "Special Ecology" and "Ecology of Soil-Water-Plant Systems" and comprises questions of scientific and applied nature conservation.</p>			
<b>Module contents</b>	<p>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.</p> <p>Restoration of Terrestrial Ecosystems (LC): The participants collect data contributing to the evaluation of current restoration projects (Hudewald, mesophilic grassland, heath, oligotrophic stagnant waters).</p>			
<b>Literaturempfehlungen</b>	<p>Bakker, J.P.: Nature management by grazing and cutting. Dordrecht 1989.  Van Andel, J., Bakker, J.P., Snaydon, R.: Disturbance in grasslands. Dordrecht 1987.  Zerbe, S. &amp; Wiegleb, G. (Hrsg.): Renaturierung von Ökosystemen in Mitteleuropa. Heidelberg 2009.  Schopp-Guth, A.: Renaturierung von Moorlandschaften. Bonn 1999.  Nick, K.J. et al.: Moorregeneration im Leegmoor/Emsland nach Schwarztorfabbau und Wiedervernässung. Bonn 2001.  Wheeler, B.D. et al.: Restoration of temperate wetlands. Baffins Lane u.a. 1995.  Perrow, M.R. &amp; Davy, A.J.: Handbook of ecological restoration; 2 volumes. Cambridge 2002.</p> <p>Additional literature will be announced during the course, if necessary.</p>			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>			
<b>Language of instruction</b>	English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	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
<b>Präsenzzeit Modul insgesamt</b>				56 h

## lök270 - Landscape Management Support Planning

<b>Module label</b>	Landscape Management Support Planning			
<b>Module code</b>	lök270			
<b>Credit points</b>	15.0 KP			
<b>Workload</b>	450 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>Michael Kleyer Prüfungsberechtigt</li> <li>Michael Kleyer</li> </ul>			
<b>Entry requirements</b>				
<b>Skills to be acquired in this module</b>	<p>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.</p> <p>Upon successful completion of the module students will gain:</p> <ul style="list-style-type: none"> <li>Technical skills in mapping plants and animals in landscapes: Records, sorting of records for preparing mapping keys; field mapping.</li> <li>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</li> </ul> <p>Ranking/position of the module within the course of studies: This module imparts both action-oriented and theoretical knowledge required for landscape management support planning.</p>			
<b>Module contents</b>	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.			
<b>Literatureempfehlungen</b>	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.			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/landeco/">https://www.uni-oldenburg.de/en/landeco/</a>			
<b>Language of instruction</b>	German			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	Medienformen: Geländearbeit, GIS-Arbeit, Präsentation der Inhalte über Beamer, Folie und Tafel, Selbststudium mit dem e-learning System <a href="http://www.GIMOLUS.de">www.GIMOLUS.de</a> ,			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>	Ü			
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Before the end of the module		Specialized practical exercise	
Course type	Comment	SWS	Frequency	Workload attendance
Exercises		10.00		140 h
Seminar		1.00	SoSe und WiSe	14 h
<b>Präsenzzeit Modul insgesamt</b>				154 h

## lök280 - Special Vegetation Ecology

<b>Module label</b>	Special Vegetation Ecology	
<b>Module code</b>	lök280	
<b>Credit points</b>	6.0 KP	
<b>Workload</b>	180 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodul zweites Fachsemester</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Cord Pepler-Lisbach</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Cord Pepler-Lisbach</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> </ul>	
<b>Entry requirements</b>	Completed Bachelor studies with ecological orientation	
<b>Skills to be acquired in this module</b>	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	
<b>Module contents</b>	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.	
<b>Literatureempfehlungen</b>	<p>Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart.</p> <p>Ellenberg, H. &amp; Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart.</p> <p>Frey, W. &amp; Lösch, R. (2010): Lehrbuch der Geobotanik. 3rd edition, Stuttgart and others.</p> <p>Pott, R. (1995): Die Pflanzengesellschaften Deutschlands. 2nd edition; Stuttgart.</p> <p>Van der Maarel, E. (ed.) (2005): Vegetation Ecology; Malden.</p> <p>Wilmanns, O. (1998): Ökologische Pflanzensoziologie. 6th edition; Heidelberg.</p>	
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>	
<b>Language of instruction</b>	German	
<b>Duration (semesters)</b>	2 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	unlimited	
<b>Reference text</b>	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.	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>		
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the module	Assignment
<b>Course type</b>	Exercises	
<b>SWS</b>	4.00	
<b>Frequency</b>		
<b>Workload attendance</b>	56 h	



## lök285 - Special Vegetation Ecology

<b>Module label</b>	Special Vegetation Ecology			
<b>Module code</b>	lök285			
<b>Credit points</b>	9.0 KP			
<b>Workload</b>	270 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Cord Pepler-Lisbach</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Cord Pepler-Lisbach</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> </ul>			
<b>Entry requirements</b>	Completed Bachelor studies with ecological orientation			
<b>Skills to be acquired in this module</b>	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.			
<b>Module contents</b>	<p>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 biocoenology and nature conservation.</p> <p>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.</p>			
<b>Literatureempfehlungen</b>	<p>Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart.</p> <p>Ellenberg, H. &amp; Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart.</p> <p>Frey, W. &amp; Lösch, R. (2010): Lehrbuch der Geobotanik. 3rd edition, Stuttgart and others.</p> <p>Pott, R. (1995): Die Pflanzengesellschaften Deutschlands. 2nd edition; Stuttgart.</p> <p>Van der Maarel, E. (ed.) (2005): Vegetation Ecology; Malden.</p> <p>Wilmanns, O. (1998): Ökologische Pflanzensoziologie. 6th edition; Heidelberg.</p>			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>			
<b>Language of instruction</b>	German			
<b>Duration (semesters)</b>	2 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	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.			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Before the end of the module		Oral examination or assignment	
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises		4.00		56 h
<b>Präsenzzeit Modul insgesamt</b>				84 h

## lök290 - Perspectives of Bioenergy

<b>Module label</b>	Perspectives of Bioenergy			
<b>Module code</b>	lök290			
<b>Credit points</b>	6.0 KP			
<b>Workload</b>	180 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule zweites Fachsemester</li> <li>• Master's Programme Water and Coastal Management (Master) &gt; Science</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald Prüfungsberechtigt</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Rainer Buchwald</li> <li>◦ Luise Dorothee Giani</li> <li>◦ Megan de Jager</li> <li>◦ Thomas Klenke</li> <li>◦ Michael Wark</li> <li>◦ Kai Michael Röhrdanz</li> </ul>			
<b>Entry requirements</b>	Bachelor studies of Natural Science, Environmental Science or Economics			
<b>Skills to be acquired in this module</b>	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.			
<b>Module contents</b>	<p>Das Wahlpflichtmodul gibt einen Einblick in die historische Entstehung und Entwicklung, die naturwissenschaftlichen, verfahrenstechnischen, energetischen, ökologischen (incl. naturschutzfachlichen) und ökonomischen Grundlagen der Bioenergie. Besonderes Augenmerk wird auf die Perspektiven verschiedener Formen der Bioenergie, gelegt, damit gleichermaßen auf ihre Möglichkeiten und Grenzen.</p> <p>a) Vorlesung "Perspektiven der Bioenergie" (Pflichtteil)  b) Seminar "Formen und Beispiele der Bioenergie" (<b>wahlweise zu c</b>)  c) Übung "Praktische Bioenergie" (<b>wahlweise zu b</b>)</p>			
<b>Literaturempfehlungen</b>				
<b>Links</b>	<a href="https://www.uni-oldenburg.de/vegetationskunde/">https://www.uni-oldenburg.de/vegetationskunde/</a>			
<b>Languages of instruction</b>	German, English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
<b>Examination</b>	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module	Assignment (for the seminar or for the exercise, alternatively) and presentation of 30 min. for a) not marked		
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Lecture		2.00		28 h
Exercises		2.00		28 h
Seminar		2.00		28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>84 h</b>

## Vertiefungsmodule drittes Fachsemester

### lök310 - Group Project: Sustainable Spatial Development

<b>Module label</b>	Group Project: Sustainable Spatial Development	
<b>Module code</b>	lök310	
<b>Credit points</b>	9.0 KP	
<b>Workload</b>	270 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose Prüfungsberechtigt</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> <li>◦ Peter Schaal</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Peter Schaal</li> </ul>	
<b>Entry requirements</b>	Participation in the module Environmental Planning	
<b>Skills to be acquired in this module</b>	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	
<b>Module contents</b>	Review of theoretical knowledge in spatial and environmental planning based on a specific planning task reflecting or integrating practical requirements.	
<b>Literaturempfehlungen</b>	Literature will be announced during the lectures.	
<b>Links</b>		
<b>Language of instruction</b>	German	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	unlimited	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>		
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the module	Special exercise (70%) und presentation (30%)
<b>Course type</b>	Project group	
<b>SWS</b>	6.00	
<b>Frequency</b>		
<b>Workload attendance</b>	84 h	

## lök320 - Sustainable Spatial Development in Europe

<b>Module label</b>	Sustainable Spatial Development in Europe
<b>Module code</b>	lök320
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> <li>• Master's Programme Sustainability Economics and Management (Master) &gt; Additional Modules</li> <li>• Master's Programme Water and Coastal Management (Master) &gt; Planning</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> <li>◦ Thomas Klenke</li> <li>◦ Markus Prinz</li> <li>◦ Peter Schaal</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> </ul>
<b>Entry requirements</b>	Good command of English
<b>Skills to be acquired in this module</b>	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.
<b>Module contents</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<b>Literatureempfehlungen</b>	<p>Akademie für Raumforschung und Landesplanung (Hrsg.): Handwörterbuch der Raumordnung. Hannover 2017.</p> <p>Cloke, P.; Marsden, T.; Mooney, P.H. (eds.): Handbook of rural studies. London 2006.</p> <p>Ermann, U. et al.: Agro-Food Studies. Eine Einführung. Köln 2018</p> <p>Fischer, A.: Sustainable Tourism. Bern 2014.</p> <p>Grabski-Kieron, U.; Mose, I.; Reichert-Schick, A.; Steinführer, A. (eds.): European rural peripheries revalued. Governance, actors, impacts. Münster 2016.</p> <p>Küster, H.: Die Entdeckung der Landschaft. Einführung in eine neue Wissenschaft. München 2012.</p> <p>Lössau, J.; Freytag, T.; Lippuner, R. (Hrsg.): Schlüsselbegriffe der Kultur- und Sozialgeographie. Stuttgart 2014</p> <p>Schmied, D. (ed.): Winning and losing. The changing geography of Europe's rural areas.</p>

Additional literature will be announced in the seminars.

<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/geo/">https://www.uni-oldenburg.de/en/geo/</a>			
<b>Languages of instruction</b>	German, English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Before the end of the module		6 CP = Report or assignment	
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Seminar		6.00		84 h
Study trip		2.00		28 h
<b>Präsenzzeit Modul insgesamt</b>				140 h

## lök321 - Sustainable Spatial Development in Europe

<b>Module label</b>	Sustainable Spatial Development in Europe
<b>Module code</b>	lök321
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodul drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Ingo Mose</li> <li>◦ Thomas Klenke</li> <li>◦ Markus Prinz</li> <li>◦ Peter Schaal</li> </ul>
<b>Entry requirements</b>	Good command of English
<b>Skills to be acquired in this module</b>	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.
<b>Module contents</b>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<b>Literatureempfehlungen</b>	<p>Cloke, P.; Marsden, T.; Mooney, P.H. (eds.): Handbook of rural studies. London 2006.  Schmied, D. (ed.): Winning and losing. The changing geography of Europe's rural areas.  Additional literature will be announced in the seminars.</p>
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/geo/">https://www.uni-oldenburg.de/en/geo/</a>
<b>Languages of instruction</b>	German, English
<b>Duration (semesters)</b>	1 Semester
<b>Module frequency</b>	jährlich
<b>Module capacity</b>	unlimited
<b>Modullevel</b>	MM (Mastermodul / Master module)
<b>Modulart</b>	Wahlpflicht / Elective

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

**Vorkenntnisse / Previous knowledge**

Examination	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Before the end of the module	9 CP = Report or assignment or oral examination (extended version)

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Seminar		6.00		84 h
Study trip		2.00		28 h
<b>Präsenzzeit Modul insgesamt</b>				<b>140 h</b>

## Iök345 - Advanced Limnology

<b>Module label</b>	Advanced Limnology			
<b>Module code</b>	Iök345			
<b>Credit points</b>	6.0 KP			
<b>Workload</b>	180 h			
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodul drittes Fachsemester</li> </ul>			
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rolf Niedringhaus</li> <li>◦ Ellen Kiel</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Rolf Niedringhaus</li> <li>◦ Ellen Kiel</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Rolf Niedringhaus</li> </ul>			
<b>Entry requirements</b>	Basic knowledge of taxonomy + determination of mainly invertebrates, basic skills in faunistic field methods, L Animal Ecology			
<b>Skills to be acquired in this module</b>	<p>Special Aquatic Ecology</p> <p>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.</p> <p>E Special Aquatic Ecology</p> <p>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</p>			
<b>Module contents</b>	<p>L Special Aquatic Ecology</p> <p>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 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.</p> <p>E Special Aquatic Ecology</p> <p>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</p>			
<b>Literatureempfehlungen</b>	See announcements in StudIP			
<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/">https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/</a>			
<b>Languages of instruction</b>	German, English			
<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	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.			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
<b>Examination</b>	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module.	Special exercise or Assignment		
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Lecture		1.00		14 h
Exercises		3.00		42 h



Course type	Comment	SWS	Frequency	Workload attendance
<b>Präsenzzeit Modul insgesamt</b>				<b>56 h</b>

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## Iök350 - Advanced Animal Ecology

<b>Module label</b>	Advanced Animal Ecology
<b>Module code</b>	Iök350
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodul drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Rolf Niedringhaus</li> <li>◦ Ellen Kiel</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Ellen Kiel</li> <li>◦ Rolf Niedringhaus</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Ellen Kiel</li> </ul>
<b>Entry requirements</b>	Basic knowledge of taxonomy + determination of mainly vertebrates, basic skills in faunistic field methods, L Animal Ecology
<b>Skills to be acquired in this module</b>	<p><b>L Special Aquatic Ecology</b> 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.</p> <p><b>E Special Aquatic Ecology</b> 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</p> <p><b>L Applied Animal Ecology</b> Qualification for preparing a professional zoecological contribution within the scope of an expert opinion; familiarization with the most important faunistic indicator groups for scientific objectives relevant to a project</p>
<b>Module contents</b>	<p><b>L Special Aquatic Ecology</b> 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 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.</p> <p><b>E Special Aquatic Ecology</b> 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</p> <p><b>L Applied Animal Ecology</b> Importance of professional zoecological 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 zoecological contribution for an expert opinion on a project; detailed description of the most important faunistic indicator groups for scientific objectives relevant to a project</p>
<b>Literatureempfehlungen</b>	See announcements in StudIP
<b>Links</b>	
<b>Languages of instruction</b>	German, English
<b>Duration (semesters)</b>	1 Semester
<b>Module frequency</b>	jährlich
<b>Module capacity</b>	unlimited
<b>Reference text</b>	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.
<b>Modullevel</b>	MM (Mastermodul / Master module)

<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination		Prüfungszeiten	Type of examination	
<b>Final exam of module</b>		Before the end of the module	Special exercise or Assignment	
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		3.00		42 h
Exercises		3.00		42 h
<b>Präsenzzeit Modul insgesamt</b>				84 h

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

<b>Module label</b>	Special Abiotic Factors (Soil/Water)
<b>Module code</b>	lök360
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Janek Greskowiak</li> <li>◦ Birte Junge</li> <li>◦ Gudrun Massmann</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Janek Greskowiak</li> <li>◦ Birte Junge</li> <li>◦ Gudrun Massmann</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Luise Dorothee Giani</li> <li>◦ Gudrun Massmann</li> </ul>
<b>Entry requirements</b>	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
<b>Skills to be acquired in this module</b>	<p>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.</p> <p>E: Hydrochemical modelling of water-rock interactions using PHREEQC: Impartment of knowledge into quantitative hydrogeochemistry and skills in hydrogeochemical modelling.</p> <p>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.</p> <p>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.</p>
<b>Module contents</b>	<p>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 (<a href="http://www.simcore.com">http://www.simcore.com</a>): Model setup, parameterization and numerical solution of the groundwater flow and advection-dispersion equations.</p> <p>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 (<a href="http://wwwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/">http://wwwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/</a>)</p> <p>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.</p> <p>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.</p>
<b>Literatureempfehlungen</b>	<p>-Appelo, C.A.J. &amp; Postma, D. (2005): Geochemistry, groundwater and pollution.- 2nd edition, A.A. Balkema.</p> <p>-Kinzelbach, W. und Rausch, R. (1995): Grundwassermodellierung - Eine Einführung mit Übungen, Gebrüder Borntraeger Berlin.</p> <ul style="list-style-type: none"> <li>• Zech, W. &amp; Hintermaier-Erhard, G. (2002): Böden der Welt. Spektrum Akademischer Verlag, Heidelberg, Berlin.</li> <li>• IUSS Working Group WRB. 2014. World Reference Base for Soil Resources 2014.</li> </ul> <p>International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; <a href="http://www.fao.org/3/a-i3794e.pdf">www.fao.org/3/a-i3794e.pdf</a> -see also announcements in StudIP</p>
<b>Links</b>	
<b>Languages of instruction</b>	German, English

<b>Duration (semesters)</b>	1 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	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			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
<b>Examination</b>	Prüfungszeiten		Type of examination	
<b>Final exam of module</b>	Before the end of the module		Oral examination or assignment	
<b>Course type</b>	<b>Comment</b>	<b>SWS</b>	<b>Frequency</b>	<b>Workload attendance</b>
Lecture		5.00		70 h
Exercises		5.00		70 h
<b>Präsenzzeit Modul insgesamt</b>				<b>140 h</b>

## lök365 - Special Abiotic Factors (Soil/Water)

<b>Module label</b>	Special Abiotic Factors (Soil/Water)
<b>Module code</b>	lök365
<b>Credit points</b>	9.0 KP
<b>Workload</b>	270 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>Luise Dorothee Giani</li> <li>Janek Greskowiak</li> <li>Birte Junge</li> <li>Gudrun Massmann</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>Luise Dorothee Giani</li> <li>Janek Greskowiak</li> <li>Birte Junge</li> <li>Gudrun Massmann</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>Luise Dorothee Giani</li> <li>Gudrun Massmann</li> </ul>
<b>Entry requirements</b>	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
<b>Skills to be acquired in this module</b>	<p>E: Applied modelling of water water and solute transport in groundwater: Performance of a sandbox experiment. Numerical modelling of groundwater flow and solute transport using PMWIN (<a href="http://www.simcore.com">http://www.simcore.com</a>): Model setup, parameterization and numerical solution of the groundwater flow and advection-dispersion equations.</p> <p>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 (<a href="http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/">http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/</a>)</p> <p>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.</p> <p>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.</p>
<b>Module contents</b>	<p>E: Applied modelling of water and substance transfer in ground water: Performance of a box corer experiment. Numerical modelling of groundwater currents and substance transfer using PMWIN (<a href="http://www.simcore.com">http://www.simcore.com</a>): Model setup, parameterization and numerical solution of groundwater current and advection dispersion equations.</p> <p>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 (<a href="http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/">http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/</a>)</p> <p>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.</p> <p>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.</p>
<b>Literaturempfehlungen</b>	<p>-Appelo, C.A.J. &amp; Postma, D. (2005): Geochemistry, groundwater and pollution.- 2nd edition, A.A. Balkema.</p> <p>-Kinzelbach, W. und Rausch, R. (1995): Grundwassermodellierung - Eine Einführung mit Übungen, Gebrüder Borntraeger Berlin.</p> <ul style="list-style-type: none"> <li>Zech, W. &amp; Hintermaier-Erhard, G. (2002): Böden der Welt. Spektrum Akademischer Verlag, Heidelberg, Berlin.</li> <li>IUSS Working Group WRB. 2014. World Reference Base for Soil Resources 2014.</li> </ul> <p>International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; <a href="http://www.fao.org/3/a-i3794e.pdf">www.fao.org/3/a-i3794e.pdf</a></p>

-see also announcements in StudIP.

**Links**

<b>Languages of instruction</b>	German, English
<b>Duration (semesters)</b>	1 Semester
<b>Module frequency</b>	jährlich
<b>Module capacity</b>	unlimited
<b>Reference text</b>	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.
<b>Modullevel</b>	MM (Mastermodul / Master module)
<b>Modulart</b>	Wahlpflicht / Elective

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

**Vorkenntnisse / Previous knowledge**

Examination	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	Before the end of the module	Oral examination or housework		
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		5.00		70 h
Exercises		5.00		70 h
<b>Präsenzzeit Modul insgesamt</b>				<b>140 h</b>

## lök370 - Ornithology

<b>Module label</b>	Ornithology	
<b>Module code</b>	lök370	
<b>Credit points</b>	6.0 KP	
<b>Workload</b>	180 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>	
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Georg Martin Klump</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Sandra Bouwhuis</li> <li>◦ Georg Martin Klump</li> <li>◦ Christine Köppl</li> <li>◦ Ulrike Langemann</li> <li>◦ Henrik Mouritsen</li> <li>◦ Heiko Schmaljohann</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Georg Martin Klump</li> </ul>	
<b>Entry requirements</b>		
<b>Skills to be acquired in this module</b>	<p>The module imparts advanced knowledge on different aspects of ornithology. The students acquire:</p> <ul style="list-style-type: none"> <li>• An extended knowledge of morphological and physiological fundamentals and the resulting ecological and behaviour-biological consequences in birds</li> <li>• Knowledge, presentation and discussion of relevant English literature from various fields of ornithology</li> </ul>	
<b>Module contents</b>	<p>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.</p>	
<b>Literatureempfehlungen</b>	<p>Bairlein F (1996) Ökologie der Vögel. G. Fischer, Stuttgart. Bennett PM, Owens IPF (2002) Evolutionary Ecology of birds: Life histories, mating systems, and extinction. Oxford Berthold P (1996) Control of bird migration. Chapman &amp; Hall, London. Brooke M, Birkhead T (1991) The Cambridge Encyclopedia of Ornithology. Cambridge UP, Cambridge. Carey C (1996) Avian energetics and nutritional ecology. Chapman &amp; Hall, New York. Catchpole CK, Slater PJB (1995) Bird song. Cambridge UP, Cambridge. Danchin E, Giraldeau L-A, Cezilly F (2008) Behavioural Ecology. Oxford Farner DS, King JR (eds., 1971-1993) Avian Biology. Vol. I-IX. Academic Press, New York. Furness RW, Monaghan P (1987) Seabird Ecology. Blackie, Glasgow. Gill FB (1990) Ornithology. Freeman, New York. Newton I (2008) The Migration Ecology of Birds. Academic Press, Amsterdam. Podulka S, Rohrbaugh RW, Bonney R (2004) Handbook of Bird Biology. Cornell Lab of Ornithology, Ithaca. Scanes CG (2015) Sturkie's Avian Physiology, 6th edition. Academic Press Scott G (2010) Essential Ornithology. Oxford University Press, Oxford</p>	
<b>Links</b>		
<b>Languages of instruction</b>	German, English	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	30	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>	V, S	
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>	Written exam in the last week of the term	Written examintaion
<b>Course type</b>	Lecture	



<b>SWS</b>	4.00
<b>Frequency</b>	SoSe oder WiSe
<b>Workload attendance</b>	56 h

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## lök375 - Advanced Ornithology

<b>Module label</b>	Advanced Ornithology
<b>Module code</b>	lök375
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Georg Martin Klump</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Sandra Bouwhuis</li> <li>◦ Georg Martin Klump</li> <li>◦ Ulrike Langemann</li> <li>◦ Heiko Schmaljohann</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Franz Bairlein</li> <li>◦ Georg Martin Klump</li> </ul>
<b>Entry requirements</b>	
<b>Skills to be acquired in this module</b>	<p>Ziel dieses Moduls ist die Vertiefung verschiedener Aspekte der Ornithologie sowie die Vermittlung aktueller Methoden aus der ornithologischen Forschung.</p> <p>++ An aktuellen Forschungsfragen orientierte sowie theoriegestützte Vertiefung von Grundlagenwissen sowie Aneignung von Detailwissen in den Einzeldisziplinen der Landschaftsökologie          ++ Befähigung zum Transfer, d.h. Übertragen, Anpassen und Erweitern von erlerntem Wissen auf neue Problemstellungen und Kompetenz zur Problemlösung          ++ Erlernen und selbständiges, zielgerichtetes Anwenden von Methoden-kenntnissen in wissenschaftlichen Forschungsarbeiten: Erfassungs-, Mess-, Auswertungs-, Modellierungs-, Bewertungs- und Planungsmethoden          + Befähigung zur (auch englischsprachigen) fachlichen und fachübergreifenden Präsentation und Kommunikation von Arbeitsergebnissen gegenüber unterschiedlichen Adressatengruppen          ++ Verantwortungsvolles Anwenden der erlernten Kompetenzen, Fähigkeiten und Fertigkeiten in verschiedenen Feldern der landschaftsökologischen Berufspraxis</p>
<b>Module contents</b>	<p>Das Modul besteht aus vier Wahlpflichtveranstaltungen (je 6 KP), von denen eines gewählt werden muss.</p> <p>Wahlpflicht A: Praktikum und Seminar "Ökologie koloniebrütender Seevögel" (6 KP).          Beobachtungen und Untersuchungen an der Flusseeeschwalbenkolonie "Banter See" in Wilhelms-haven, im Rahmen einer Langzeitstudie des Instituts für Vogelforschung. Dabei nehmen die Studie-renden eigenständig Verhalten auf, lernen moderne Methoden der automatischen Registrierung von Vögeln, ihrer Raumnutzungsmuster und Körpermassen kennen, führen Beobachtungen zur Ernährung in Abhängigkeit von Umweltfaktoren durch und lernen, die Organisation einer Vogelkolonie zu verste-hen. Schließlich werten sie die erfassten Daten statistisch aus. Ziel ist das vertiefte Verständnis der Zusammensetzung, Organisation und Funktion einer Vogelkolonie, von Verhaltensweisen der Balz, der Abstimmung der Paarpartner, der Verhaltensregulation durch Zeitgeber, von Zeitbudgets, Individualität und Territorialität, Nahrungswahl und Ernährungsstrategien sowie der Bedeutung der Balzfütterung für die Reproduktion. Im begleitenden Seminar werden Originalpublikationen vorgestellt und diskutiert, welche die im Praktikum vermittelten Arbeitsweisen für ökologische Untersuchungen an Vögeln ein-setzen und damit Ergebnisse erzielen.</p> <p>Wahlpflicht B: Praktikum und Seminar "Kommunikation der Vögel" (6 KP).          In diesem Praktikum erhalten Sie digitale Aufnahmen von Vogelgesängen, die in Rahmen eines frühe-ren Forschungsprojektes gesammelt wurden. Aus diesen Aufnahmen gewinnen Sie ihren eigenen Da-tensatz für das Praktikum. Sie generieren Sonagramme und analysieren die Wellenformen und Spek-tren der Gesangsaufnahmen. Mit verschiedenen Methoden werden Sie dann z.B. Laute klassifiziert oder das Lautrepertoire von Individuen oder von Populationen erstellen. Dabei lernen Sie neben einer visuellen Klassifizierung auch statistische Methoden zur Klassifizierung kennen. Übliche Methoden um die Ähnlichkeiten von "Objekten" oder Gesangstypen zu bewerten sind z.B. Diskriminanzanalysen und Clusteranalysen. Im begleitenden Seminar werden Grundlagen der akustischen Kommunikation von Vögeln anhand eines Standardwerkes zum Vogelgesang erarbeitet. Die entsprechende Literatur haben Sie bereits vor dem Praktikum gelesen, im Seminar wird diese dann vorgestellt und gemeinsam disku-tiert.</p> <p>Wahlpflicht C: Praktikum und Seminar "Ernährungsphysiologie der Vögel" (6 KP).          Im Praktikum werden die grundsätzlichen Fragen und Methoden der Ernährung von Vögeln in eigen-ständigen Experimenten im Labor und in Freilandbeobachtungen behandelt. Die Laboruntersuchungen erfolgen an</p>

Singvögeln, die Freilanduntersuchungen vornehmlich an Gänsen und Limikolen. Schwerpunkte des Praktikums wie des Seminars sind Aspekte der Stoffwechselphysiologie, wie Respirometrie, der Nahrungswahl, wobei hierbei die Rolle von Nährstoffen und sekundären Pflanzenstoffen und ihre Wechselbeziehungen im Mittelpunkt steht, und Aspekte der Ernährungsstrategie von Gänsen in ihrer natürlichen Umgebung. Das Seminar dient der Vertiefung des Themas anhand aktueller Fachpublikationen.

Wahlpflicht D: Praktikum und Seminar "Einführung in die Feldornithologie", inkl. Bestimmungsübungen (6 KP)  
In dem Praktikum werden elementare Methoden (Brutvogelkartierung, Radiotelemetrie u.a.) der Feldornithologie vorgestellt und von den Studenten im Feld selbstständig angewendet. Eine Grundlage für die wissenschaftlich korrekte Anwendung dieser Methoden ist die Artenkenntnis unserer Avifauna. Diese wird durch Exkursionen, Arbeiten an Vogelpräparaten und anhand von Vorträgen vermittelt. Diese im ersten Teil des Praktikums vermittelten Grundlagen stellen die Basis für den zweiten Teil des Praktikums dar. In diesem soll das Ziel des Praktikums, die selbstständige Durchführung einer wissenschaftlichen ornithologischen Arbeit, erreicht werden.

<b>Literaturempfehlungen</b>	<p>Bairlein F (1996) Ökologie der Vögel. G. Fischer, Stuttgart.          Bennett PM, Owens IPF (2002) Evolutionary Ecology of birds: Life histories, mating systems, and extinction. Oxford          Bibby, CJ, Burgess, ND, Hill, DA. 1995. Methoden der Feldornithologie. Bestandserfassung in der Praxis. Neumann Verlag. Radebeul.          Brooke M, Birkhead T (1991) The Cambridge Encyclopedia of Ornithology. Cambridge UP, Cambridge.          Catchpole CK, Slater PJB (1995) Bird song. Cambridge UP, Cambridge.          Danchin E, Giraldeau L-A, Cezilly F (2008) Behavioural Ecology. Oxford          Podulka S, Rohrbaugh RW, Bonney R (2004) Handbook of Bird Biology. Cornell Lab of Ornithology, Ithaca.          Scanes CG (2015) Sturkie's Avian Physiology, 6th edition. Academic Press (an imprint of Elsevier)          Scott G (2010) Essential Ornithology. Oxford University Press, Oxford.          Südbeck, P, Andretzke, H, Fischer, S, Gedeon, K, Schikore, T, Schröder, K, Sudfeldt, C. 2005. Methodenstandards zur Erfassung der Brutvögel Deutschlands. Radolfzell.          Sutherland, WJ, Newton, I, Green RE. 2004. Bird ecology and conservation. Oxford University Press. New York</p>	
<b>Links</b>		
<b>Languages of instruction</b>	German, English	
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	jährlich	
<b>Module capacity</b>	12	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Wahlpflicht / Elective	
<b>Lern-/Lehrform / Type of program</b>	PR, S	
<b>Vorkenntnisse / Previous knowledge</b>		
<b>Examination</b>	Prüfungszeiten	Type of examination
<b>Final exam of module</b>		PT
<b>Course type</b>	Practical	
<b>SWS</b>	4.00	
<b>Frequency</b>	SoSe oder WiSe	
<b>Workload attendance</b>	56 h	

## lök390 - Experimental designs in ecological field studies

<b>Module label</b>	Experimental designs in ecological field studies
<b>Module code</b>	lök390
<b>Credit points</b>	6.0 KP
<b>Workload</b>	180 h
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Vertiefungsmodule drittes Fachsemester</li> </ul>
<b>Ansprechpartner/-in</b>	<p>Module responsibility</p> <ul style="list-style-type: none"> <li>◦ Ellen Kiel</li> <li>◦ Ines Wolpmann</li> </ul> <p>Prüfungsberechtigt</p> <ul style="list-style-type: none"> <li>◦ Ellen Kiel</li> <li>◦ Ines Wolpmann</li> </ul> <p>Module counseling</p> <ul style="list-style-type: none"> <li>◦ Ellen Kiel</li> </ul>
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>• Basic courses of Ecology (1st and 2nd semesters LÖK)</li> <li>• Skills in determining aquatic organisms, e.g. via Bachelor modules <ul style="list-style-type: none"> <li>◦ Knowledge of forms</li> <li>◦ Running water ecology</li> <li>◦ Aquatic habitats</li> <li>◦ Master course in the module "Aquatic Ecology"</li> <li>◦ Comparable courses at other universities</li> </ul> </li> </ul>
<b>Skills to be acquired in this module</b>	<ul style="list-style-type: none"> <li>- Qualification to independently plan field experiments suitable for answering current ecological questions (individuals, populations, communities)</li> <li>- Methodological competence/independence in performing field experiments</li> <li>- Qualification to independently analyse the experiments in the laboratory guided by hypotheses and using adequate methods, materials and statistical methods</li> <li>- Competence in presenting results on a scientific level (scientific report presenting and discussing the method; scientific publication; both in English)</li> <li>- Impartment of manifold methodological skills in the field of aquatic ecology, experimental field research (autecological, population-ecological and synecological research approaches)</li> <li>- 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)</li> <li>- Practical experience in analysing field experiments in general (comprising laboratory phases, access to literature and databases, preparation of scientific publications)</li> <li>- Preparation of Master and Ph.D. theses requiring skills in experimental field research</li> </ul>
<b>Module contents</b>	<p>1st course phase (theoretical preparation and planning)</p> <ul style="list-style-type: none"> <li>- 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)</li> <li>- Specification of questions and frame conditions by the course lecturer concerning current research questions in the fields of autecology, population ecology, and synecology</li> <li>- Instructions for literature research and the respective analysis by students</li> <li>- 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))</li> <li>- Concrete formulation of questions and working hypotheses based on literature research</li> </ul> <p>2nd course phase (practical preparation and planning; laboratory and field work)</p> <ul style="list-style-type: none"> <li>- Preparatory inspection of the investigation area accompanied by the lecturer</li> <li>- Independent development of a concept of methods (advised by the lecturer)</li> <li>- Presentation of the planned experiment and of the analysis (treatment of samples, data processing etc.)</li> <li>- 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.)</li> <li>- Description of methods for all working steps in writing</li> <li>- Independent realization of planning (advised by lecturer)</li> <li>- Report on all procedures including reflection</li> </ul> <p>3rd course phase (further development and application of acquired knowledge; theoretical phase)</p> <ul style="list-style-type: none"> <li>- Common discussion about the possibilities of and limits to applying the procedure to concrete questions concerning other habitats, other animal associations etc.</li> </ul>
<b>Literatureempfehlungen</b>	<p>Hauer, F. Richard &amp; Lamberti, Gary A. (2007): Methods in Stream Ecology (Elsevier Inc.)  Methods in Ecology and Evolution (British Ecological Society):  <a href="http://www.methodsinecologyandevolution.org/view/0/index.html">http://www.methodsinecologyandevolution.org/view/0/index.html</a>  TIEE: <a href="http://www.esa.org/tiee/misc/about.html">http://www.esa.org/tiee/misc/about.html</a></p> <p>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.</p>

<b>Links</b>	<a href="https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/">https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/</a>			
<b>Language of instruction</b>	English			
<b>Duration (semesters)</b>	2 Semester			
<b>Module frequency</b>	jährlich			
<b>Module capacity</b>	unlimited			
<b>Reference text</b>	Independent literature research on specific questions and methods by students.			
<b>Modullevel</b>	MM (Mastermodul / Master module)			
<b>Modulart</b>	Wahlpflicht / Elective			
<b>Lern-/Lehrform / Type of program</b>				
<b>Vorkenntnisse / Previous knowledge</b>				
Examination	Prüfungszeiten	Type of examination		
<b>Final exam of module</b>	as agreed	Oral examination or homework 1) oral or written presentation of the method design 2) documentation of experimental procedure, data analysis and data processing 3) oral or written subject-specific analysis of the planning in respect of the relevant questions and elaborated hypotheses 4) interdisciplinary analysis of the experiments (oral or in writing)		
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		1.00		14 h
Exercises		3.00		42 h
<b>Präsenzzeit Modul insgesamt</b>				<b>56 h</b>

## Abschlussmodul

### mam - Master's Degree Module

<b>Module label</b>	Master's Degree Module	
<b>Module code</b>	mam	
<b>Credit points</b>	30.0 KP	
<b>Workload</b>	900 h	
<b>Used in course of study</b>	<ul style="list-style-type: none"> <li>• Master's Programme Landscape Ecology (Master) &gt; Abschlussmodul</li> </ul>	
<b>Ansprechpartner/-in</b>	Module responsibility <ul style="list-style-type: none"> <li>◦ Lehrende der Landschaftsoekologie Prüfungsberechtigt</li> <li>◦ Lehrende der Landschaftsoekologie</li> </ul>	
<b>Entry requirements</b>		
<b>Skills to be acquired in this module</b>	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.	
<b>Module contents</b>	E: Preparing the Master thesis SE: Active participation in the seminar of the research group, in which the Master thesis is written.	
<b>Literatureempfehlungen</b>	Supervisors may supply an initial reading list with important literature. The students are expected to find and use further literature as needed.	
<b>Links</b>		
<b>Languages of instruction</b>		
<b>Duration (semesters)</b>	1 Semester	
<b>Module frequency</b>	semiannual	
<b>Module capacity</b>	unlimited	
<b>Modullevel</b>	MM (Mastermodul / Master module)	
<b>Modulart</b>	Pflicht / Mandatory	
<b>Lern-/Lehrform / Type of program</b>	S (angeleitete selbständige Arbeit)	
<b>Vorkenntnisse / Previous knowledge</b>		
Examination	Prüfungszeiten	Type of examination
<b>Final exam of module</b>		Master's Thesis (80%) Oral examination (20%)
<b>Course type</b>	Seminar	
<b>SWS</b>	2.00	
<b>Frequency</b>		
<b>Workload attendance</b>	28 h	

