

Basismodule

lök100 - Data Modelling

Module label	Data Modelling
Module code	lök100
Credit points	9.0 KP
Workload	270 h
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Basismodule
Responsible persons	<p>Peppler-Lisbach, Cord (Module responsibility)</p> <p>Peppler-Lisbach, Cord (Module counselling)</p> <p>Peppler-Lisbach, Cord (Authorized examiners)</p> <p>Greskowiak, Janek (Authorized examiners)</p>
Prerequisites	
Skills to be acquired in this module	<ul style="list-style-type: none"> 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	<p>Part 1: Introduction to statistical analysis of ecological data NN (NN)</p> <ul style="list-style-type: none"> Experimental design Explorative data analysis Distribution tests, data transformation Chi² test Anova, Kruskal-Wallis test t & U test Multiple comparisons, post-hoc tests <p>Part 2: Habitat modelling and spatial statistics (Biedermann)</p> <ul style="list-style-type: none"> Linear (OLS) regression GLM (logistic regression, Poisson regression) Spatial explicit modelling, GIS integration Spatial statistics <p>Part 3: Multivariate analysis of vegetation ecological data (Peppler-Lisbach)</p> <p>Classification:</p> <ul style="list-style-type: none"> Cluster analysis Statistical degrees of fidelity <p>Ordination:</p> <ul style="list-style-type: none"> Indirect procedures: PCA, CA, DCA Canonical procedures: RDA, CCA
Reader's advisory	Crawley, M.J. (2007): The R Book. 942 S. Wiley & Sons, Chichester.

Additional literature will be announced during the course.

Links	https://www.uni-oldenburg.de/en/landeco/	
Language of instruction	German	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	Ü	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the course	Assignment
Course type	Exercises	
SWS	6	
Frequency	WiSe	
Workload attendance	84 h	

Iök110 - Ecology

Module label	Ecology	
Module code	Iök110	
Credit points	6.0 KP	
Workload	180 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Basismodule 	
Responsible persons	<p>Kleyer, Michael (Module responsibility)</p> <p>Kleyer, Michael (Module counselling)</p> <p>Kiel, Ellen (Module counselling)</p> <p>Zotz, Gerhard Wolfgang (Module counselling)</p> <p>Kiel, Ellen (Authorized examiners)</p> <p>Albach, Dirk Carl (Authorized examiners)</p> <p>Kleyer, Michael (Authorized examiners)</p> <p>Zotz, Gerhard Wolfgang (Authorized examiners)</p>	
Prerequisites	Knowledge of phytosociology, zoo-ecology, pedology and ecology, comparable to the corresponding modules of BSc. Environmental Sciences	
Skills to be acquired in this module	<p>Qualification imparted to students: Upon successful completion of the module the students will gain:</p> <ul style="list-style-type: none"> a thorough knowledge of environmental conditions and biological mechanisms enabling plant species to survive in landscapes a thorough knowledge of the eco-physiology of plants in landscapes a thorough knowledge of the environmental conditions and biological mechanisms enabling animals to survive in landscapes <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>	
Module contents	Ecology of plants in landscapes Eco-physiology of plants in landscapes Ecology of animals in landscapes	
Reader's advisory	Literature will be announced during the course.	
Links	https://www.uni-oldenburg.de/en/landeco/	
Language of instruction	German	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	V	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	a) Written examination (33 %) b) Written examination (33 %) c) Written examination (33 %)
Course type	Lecture	
SWS	3	
Frequency		

Workload attendance

42 h

lök120 - Geoecological Processes

Module label	Geoecological Processes			
Module code	lök120			
Credit points	6.0 KP			
Workload	180 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Basismodule 			
Responsible persons	<p>Pollmann, Thomas (Module responsibility)</p> <p>Massmann, Gudrun (Module counselling)</p> <p>Pollmann, Thomas (Module counselling)</p> <p>Freund, Holger (Authorized examiners)</p> <p>Kalinina, Olga (Authorized examiners)</p> <p>Massmann, Gudrun (Authorized examiners)</p> <p>Pollmann, Thomas (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<p>Upon successful completion of the module the students will gain:</p> <ul style="list-style-type: none"> - advanced skills in analysing a landscape unit - a thorough knowledge of geological, pedological, hydrological, hydrogeological, and botanical relationships within an ecosystem - a thorough knowledge of the genesis and properties of Northwest German soils - a thorough knowledge of hydrological and hydrogeological properties of Northwest Germany - a fundamental knowledge of national and international soil systematics - the qualification to ecologically record and assess soils (including humus form) - the ability to perform soil ecological interpretations 			
Module contents	<p>Landscape unit Spiekerroog (EX/E)</p> <p>Special Pedology (L)</p> <p>Special Hydrogeology (L)</p> <p>Pedological field work (E)</p>			
Reader's advisory	Literature will be announced during the lecture.			
Links	https://uol.de/ibu			
Language of instruction	German			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	30			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	V, Ü/EX			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		Written examination	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises (mit Exkursion)		2	WiSe	28
Total time of attendance for the module				56 h

lök130 - Environmental Planning

Module label	Environmental Planning
Module code	lök130
Credit points	9.0 KP
Workload	270 h
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Basismodule
Responsible persons	<p>Schaal, Peter (Module responsibility)</p> <p>Schaal, Peter (Module counselling)</p> <p>Kalinina, Olga (Authorized examiners)</p> <p>Lecke-Lopatta, Thomas (Authorized examiners)</p> <p>Schaal, Peter (Authorized examiners)</p>
Prerequisites	Basic knowledge of environmental planning. Students who have not gained such basic knowledge during the Bachelor course please contact the persons responsible for the module in order to evaluate possibilities for catching up relevant knowledge.
Skills to be acquired in this module	<p>The students will</p> <ul style="list-style-type: none"> • gain advanced knowledge into the formal and informal organization of spatial developmental processes in a combination of disciplinary and interdisciplinary concepts; • get to know the system of privileged planning combined with cross-section planning as well as investigate and assess possible deductions for concrete decision making; • elaborate case studies and typical planning problems in seminar papers and develop their own positions regarding the instruments; • get to know assessment methods for all important ecosystem compartments and gain the skills to deduce ecosystem services from ecosystem functions. <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>
Module contents	<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>
Reader's advisory	<p>Akademie für Raumforschung und Landesplanung (ed.): Handwörterbuch der Raumordnung, Hannover 1995.</p> <p>Benz, A.: Governance. Regieren in komplexen Regelsystemen. Eine Einführung. 2nd edition. Wiesbaden 2010.</p> <p>Grundwasserbewirtschaftungsplan Hessisches Ried. Darmstadt 1999.</p> <p>Moseley, M.J. (Ed.): Local Partnerships for Rural Development. The European Experience. Cambridge 2003.</p> <p>Pütz, M.; Buchholz, K.-H. (2003): Anzeige- und Genehmigungsverfahren nach dem Bundes-Immissionsschutzgesetz. 7th edition. Berlin.</p> <p>Wikipedia: http://de.wikipedia.org/wiki/Fachplanung</p> <p>Additional literature will be announced during the lectures.</p>
Links	https://www.uni-oldenburg.de/en/landeco/
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel / module level	MM (Mastermodul / Master module)
Modulart / typ of module	Wahlpflicht / Elective
Lehr-/Lernform / Teaching/Learning method	<p>a) V/SE 2 SWS</p> <p>b) SE 2 SWS</p>

c) SE 2 SWS
Gruppengröße entsprechend der Zulassungszahl

Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Seminar paper
Course type	Seminar	
SWS	6	
Frequency		
Workload attendance	84 h	

lök140 - Applied GIS Methods in Landscape Ecology

Module label	Applied GIS Methods in Landscape Ecology
Module code	lök140
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Basismodule
Responsible persons	<p>Schaal, Peter (Module responsibility)</p> <p>Schaal, Peter (Module counselling)</p> <p>Aden, Christian (Module counselling)</p> <p>Schaal, Peter (Authorized examiners)</p> <p>Aden, Christian (Authorized examiners)</p>
Prerequisites	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.
Skills to be acquired in this module	<p>Vermittelte Qualifikation:</p> <p>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.</p> <p>Stellenwert/Verortung Modul im Studiengang</p> <p>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</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>
Module contents	<p>a) Praktisches Arbeiten mit GIS (Ü)</p> <p>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)</p> <p>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>
Reader's advisory	<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</p> <p>Law, Michael; Collins, Amy: Getting to Know ArcGIS (Englisch), 2015.</p> <p>Liebig, W.; Mummert, R.-D.: ArcGIS-ArcView. Band 2 ArcGIS-Analysen. Norden. 2005.</p> <p>Liebig, W.: ArcGIS-ArcView 9 - Personal Geodatabase. Norden. 2006.</p> <p>Bill, R.: Grundlagen der Geo-Informationssysteme. Band 2. Analysen, Anwendungen und neue Entwicklungen. 5. Aufl. Heidelberg. 2010.</p> <p>Albertz, J.: Einführung in die Fernerkundung. 3. Aufl. Darmstadt. 2007.</p> <p>Haverkamp, Wegener: Methodenentwicklung zur GIS-gestützten Modellierung des Landschaftswasserhaushaltes. Gießen. 2000.</p> <p>Berkhoff, K.: GIS-basierte Modellierung der Grundwasserempfindlichkeit in einer agrarischen Intensivregion. 2008.</p>
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich

Module capacity	30	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	S, Ü	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Veranstaltungsende	Ü
Course type	Exercises	
SWS	4	
Frequency	SoSe oder WiSe	
Workload attendance	56 h	

lök145 - Geospatial Datamanagement and Geostatistical Analysis

Module label	Geospatial Datamanagement and Geostatistical Analysis
Module code	lök145
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none">• Master's Programme Landscape Ecology (Master) > Basismodule
Responsible persons	Schaal, Peter (Module responsibility) Schaal, Peter (Module counselling) Aden, Christian (Authorized examiners) Schaal, Peter (Authorized examiners)
Prerequisites	Wer in seinem Bachelorstudium keine vertiefenden GIS-Kenntnisse erworben hat, sollte das vorlaufende Modul „GIS-Anwendungen in der Landschaftsökologie“ absolviert haben.
Skills to be acquired in this module	Vermittelte Qualifikation: Basiswissen über die Ziele und Nutzen von Geodateninfrastrukturen und internationalen Standards für Geodaten und Geodatendienste Implementieren und Anwenden von Standards für die Publikation von Geodaten und Geodatendiensten (WMS, WPS, CSW) Einsatz von Geodatenbanken für das Management von Geodaten und deren Analyse Verwendung geostatistischer Verfahren und GIS-Analysen mittels GIS und Statistik-Software Stellenwert/Verortung Modul im Studiengang Das Modul baut auf dem vorlaufenden Master - Modul „GIS-Anwendungen in der Landschaftsökologie“ auf. ++ 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 ++ 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
Module contents	a) WebGIS und Datenmanagement (Ü) Einführung in Geodateninfrastrukturen, Web Mapping, WebGIS und internationale Standards Arbeiten mit (Geo-)Datenbanken für Vektor- und Rasterdaten Aufbereitung, Integration und Vorhaltung von Geodaten in verschiedenen Formaten und Geodatenbanken Gezielte Abfragen von Vektordaten und Einbindung von GIS-Analysen mit der Structured Query Language (SQL) und PostGIS-Funktionen Einsetzen von MapClients in Webseiten, Erfassen von Geodaten mit Hilfe von Formularen und digitalen Karten sowie Speicherung der Daten in Geodatenbanken Herstellen und Abbilden von Karten in MapClients und interoperablen GIS auf Basis von Standards des Open Geospatial Consortiums (OGC), einschl. Symbologie, Labels, Charts, Datenabfragen, ... b) Rasteranalysen und Geostatistik (Se/Ü) Geostatistische Verfahren und Herstellung von Rasterdaten 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))

Reader's advisory	<p>KORDUAN, P. & ZEHNER, M. L. (2008): Geoinformation im Internet. Technologien zur Nutzung raumbezogener Informationen im WWW, Wichmann, Heidelberg.</p> <p>KRESSE, W. & FADAIE, K. (2004): ISO Standards for Geographic Information, Springer, Berlin.</p> <p>MITCHELL, T. (2008): Web Mapping Illustrated: Using Open Source GIS Toolkits. O'Reilly, Sebastopol, CA.</p> <p>PENG, Z.-R. & TSOU, M.-H. (2003): Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks, Wiley, Hoboken, NJ.</p> <p>PEREZ, A. S. (2012): OpenLayers Cookbook. Packt Publishing.</p> <p>OBE, R. O. & HSU, L. (2014): PostGIS in Action. Manning Publications.</p> <p>FISCHER-STABEL, P. (2013): Umweltinformationssysteme: Grundlegende</p>	
Links		
Language of instruction	German	
Duration (semesters)	1 Semester	
Module frequency		
Module capacity	30	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	Ü	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Veranstaltungsende	Ü
Course type	Exercises	
SWS	4	
Frequency	SoSe oder WiSe	
Workload attendance	56 h	

bio675 - Molecular Ecology

Module label	Molecular Ecology			
Module code	bio675			
Credit points	12.0 KP			
Workload	360 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Biology (Master) > Background Modules • Master's Programme Biology (Master) > Background Modules • Master's Programme Landscape Ecology (Master) > Basismodule 			
Responsible persons	<p>Nolte, Arne (Module responsibility)</p> <p>Gerlach, Gabriele (Module counselling)</p> <p>Nolte, Arne (Authorized examiners)</p> <p>Gerlach, Gabriele (Authorized examiners)</p>			
Prerequisites	<p>B.Sc. (Biologie, Umweltwissenschaften)</p> <p>M.Sc. (Biologie, Marine Umweltwissenschaften, Landschaftsökologie)</p>			
Skills to be acquired in this module	<p>The field of molecular ecology strives to identify relationships between species genotypes, phenotypes and ecological factors. It addresses questions about how organisms adapt and explains patterns of distribution and biodiversity. During the course, participants will get to know the biological background to design an experiment in the field of molecular ecology. We will discuss the state of the art according to literature. Participants will perform sampling and conduct steps of the analysis. The course will cover field methods (sampling) and lab methods (behavior experiments, genetic analyses, phenotypic analyses) as well as computer based analyses.</p> <p>++ deepened biological expertise ++ deepened knowledge of biological working methods ++ data analysis skills + interdisciplinary thinking + critical and analytical thinking + independent searching and knowledge of scientific literature ++ ability to perform independent biological research ++ data presentation and discussion in German and English (written and spoken) + statistics & scientific programming</p>			
Module contents	<p>Lecture: AN/GG - Molecular ecology background of specific study systems. The lectures will introduce a study system that will be analyzed during the course (study systems may vary from year to year). It is the goal of the lecture to provide students with background information to develop an experimental design of a field study during the practical.</p> <p>Excercise: AN/GG - Mixed course with laboratory and field exercises. Samples will be collected in the field. One goal of the course is to apply modern analyses to understand how organisms are distributed. Another aspect is the application of molecular markers to analyze behavioral experiments.</p>			
Reader's advisory	will be announced during the course			
Links				
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency				
Module capacity	15			
Reference text	associated with bio890 Current Topics of Biology (Seminar)			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge	Lesen von englischer Fachliteratur und die Präsentation von Seminarthemen auf Englisch. Grund-kenntnisse zum Arbeiten in einem Genlabor und mit dem Computer.			
Examination	Time of examination	Type of examination		
Final exam of module	during the module	Präsentationen (50%), Portfolio (50%). Regular participation is a prerequisite to pass in the module.		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SuSe	28

Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Exercises		6	SuSe	84
Total time of attendance for the module				112 h

bio770 - Field Methods in Organismal Biology

Module label	Field Methods in Organismal Biology			
Module code	bio770			
Credit points	15.0 KP			
Workload	450 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Biology (Master) > Background Modules • Master's Programme Biology (Master) > Background Modules • Master's Programme Landscape Ecology (Master) > Basismodule 			
Responsible persons	<p>Zotz, Gerhard Wolfgang (Module responsibility)</p> <p>Gerlach, Gabriele (Module counselling)</p> <p>Albach, Dirk Carl (Module counselling)</p> <p>Glatzel, Thomas (Module counselling)</p> <p>von Hagen, Klaus Bernhard (Module counselling)</p> <p>Mouritsen, Henrik (Module counselling)</p> <p>Zotz, Gerhard Wolfgang (Authorized examiners)</p> <p>Gerlach, Gabriele (Authorized examiners)</p> <p>Albach, Dirk Carl (Authorized examiners)</p> <p>Glatzel, Thomas (Authorized examiners)</p> <p>von Hagen, Klaus Bernhard (Authorized examiners)</p> <p>Mouritsen, Henrik (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<p>[nop] ++ deepened biological expertise ++ deepened knowledge of biological working methods ++ data analysis skills + interdisciplinary thinking ++ critical and analytical thinking ++ independent searching and knowledge of scientific literature ++ ability to perform independent biological research + data presentation and discussion in German and English (written and spoken) ++ project and time management ++ statistics & scientific programming [/nop] The molecule aims at enabling students to apply theoretical knowledge to practical, hypothesis-based field studies within the scope of a seminar. The data derived from the individual projects performed are then to be documented and discussed in the form of a written laboratory course report oriented by a scientific publication and to be written in English. Several teachers cooperate to enable interdisciplinary approaches (e.g. botanical-zoological approaches).</p>			
Module contents	<p>S: Biogeographic and ecological classification and characterization of a biome (e.g. Mediterranean region, moist tropics, boreal zone), independent identification and treatment of scientific questions, presentation of scientific results in a "mini symposium" subsequent to the field studies. E: Planning and performing a field study project, data analysis, written report in the form of a scientific publication</p>			
Reader's advisory	Varies with topic and field locality			
Links	www.uni-oldenburg.de/fun_eco/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	21			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module			2 Presentations (30 %) Laboratory course report on project work (70 %)	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Exercises		10	SuSe	140

Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar		2	SuSe	28
Seminar (Pflichtveranstaltung für Erstsemester OHNE bisherige Belehrung)			WiSe	0
Total time of attendance for the module				168 h

mar456 - Coastal Holocene

Module label	Coastal Holocene
Module code	mar456
Credit points	6.0 KP
Workload	180 h (Präsenzzeit: 56 Stunden, Selbststudium: 124 Stunden)
Applicability of the module	<ul style="list-style-type: none">• Master's Programme Landscape Ecology (Master) > Basismodule• Master's Programme Marine Environmental Sciences (Master) > Mastermodule
Responsible persons	Freund, Holger (Module responsibility) Prinz, Markus (Module counselling)
Prerequisites	Keine
Skills to be acquired in this module	Die Studierenden verstehen die geologischen, sedimentologischen und landschaftsprägenden Transport- und Ablagerungsprozesse im nordwestdeutschen Tiefland (fluviatiler, äolischer, mariner und glazigener Transport) sowie die Verknüpfung dieser Prozesse mit den wichtigsten Vegetationstypen (Wälder, Moore, Trockenlebensräume, Küstenlebensräume) dieser Region.

Module contents

VL Nordwestdeutsches Küstenholozän – Geologie, Vegetation und Biostratigraphie

Die Vorlesung vermittelt Kenntnisse der Materialaufbereitung und –umlagerung auf der Erdoberfläche, geomorphologischer Formungsprozesse und der Landschaftsdynamik am Beispiel der nordwestdeutschen Tiefebene. Behandelt werden kalt- und warmzeitliche Ablagerungszyklen und deren Ursachen, Meeresspiegelfluktuationen und die daran gekoppelte Vegetationsdynamik. Die wichtigsten Vegetationsformen Nordwestdeutschlands werden exemplarisch vorgestellt (Wälder, Moore, Trockenlebensräume und Küstenvegetation).

PR Biologische Methoden der Faziesansprache von Küstenablagerungen – Pollen- und Diatomeenanalyse

In der Übung werden Kenntnisse der Palynologie (Pollen- und Sporenkunde) und der Diatomologie praktisch vermittelt. Einsatzmöglichkeiten dieser Methoden werden an Fallbeispielen erläutert. Die Studierenden lernen die wichtigsten Pollen –und Sporentypen sowie die wichtigsten benthischen Diatomeen der Nordsee kennen. Anhand von Bohrkernen erarbeiten die Studierenden wie sich mit Hilfe von Mikrofossilien paläoökologische Fragestellungen beantworten bzw. die Rekonstruktion von Landschafts- und/oder Ökosystemveränderungen durchgeführt werden können. In einem Forschungsbericht dokumentieren die Studierenden ihre Ergebnisse der Bohrkernanalyse.

Reader's advisory

Bahlburg, H. & Breitzkreuz, C. (2008): Grundlagen der Geologie. Spektrum
Ehlers, J. (2011): Das Eiszeitalter. Spektrum
Lang, G. (1994): Quartäre Vegetationsgeschichte Europas. Fischer
Moore, P.D., Webb, J.A. & Collinson, M.E. (1991): Pollen Analysis. Oxford
Pott, R. (1996): Biotoptypen: Schützenswerte Lebensräume Deutschlands und angrenzender Regionen. Ulmer
Schäfer, A. (2005): Klastische Sedimente – Fazies- und Sedimentstratigraphie. Elsevier
Weitere Literatur wird in den Veranstaltungen angegeben.

Links

Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	20 (20 Personen im Praktikum Fazieskunde Verfahren siehe StudIP)

Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	PR Biologische Methoden der Faziesansprache von Küstenablagerungen – Pollen- und Diatomeenanalyse (2 SWS, 3 KP) VL Nordwestdeutsches Küstenholozän – Geologie, Vegetation und Biostratigraphie (2 SWS, 3 KP)			
Vorkenntnisse / Previous knowledge	Nützlich: Grundlegende Kenntnisse in Geologie und Botanik			
Examination	Time of examination		Type of examination	
Final exam of module	Abgabe des Berichts bis Ende des Semesters		KL	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SuSe	28
Seminar or internship		2	SuSe	28
Total time of attendance for the module				56 h

mar458 - Aquatic Ecology

Module label	Aquatic Ecology
Module code	mar458
Credit points	6.0 KP
Workload	180 h (Präsenzzeit: 56 Stunden, Selbststudium: 124 Stunden)
Applicability of the module	<ul style="list-style-type: none">• Master's Programme Environmental Modelling (Master) > Mastermodule• Master's Programme Landscape Ecology (Master) > Basismodule• Master's Programme Marine Environmental Sciences (Master) > Mastermodule
Responsible persons	Simon, Meinhard (Module responsibility) Brinkhoff, Thorsten Henning (Module counselling)
Prerequisites	Keine
Skills to be acquired in this module	

Studierende können nach erfolgreichem Besuch der Veranstaltungen die Bedeutung von Schwebstoffen für die Ökologie und Biogeochemie und die Gefährdung von Gewässern einschätzen und beurteilen, da sie sich vertieftes Wissen über folgende Gebiete angeeignet haben:

VL Grundlagen des Gewässerschutzes:

Störungen und Gefährdung natürlicher Gewässer,

Eutrophierung, Phosphor- und Stickstoffbelastung natürlicher Gewässer, Saprobien-systeme, Gewässerversauerung, hygienische Belastung, Trinkwasseraufbereitung, Abwasserklärung, hormonell wirksame Substanzen

VL Biologische Bedeutung von Schwebstoffen

Herkunft, Klassifizierung und Verteilung in Gewässern, Analytik, Transport und Sedimentation, Aggregation und Aggregatbildungsmechanismen, Fallbeispiele von Aggregationsereignissen, mikrobielle Besiedlung, mikrobielle Stoffumsatzaktivität, Strukturanalyse von aggregatassoziierten Bakteriengemeinschaften.

Module contents

VL Grundlagen des Gewässerschutzes

Allgemeine Grundlagen zum Verständnis von Gewässern (Seen, Flüsse, Grundwasser, Ästuar, Küstenmeere) für deren Gefährdungspotenzial.

Eutrophierung und Sanierung von Gewässern, Bedeutung von Phosphor- und Stickstoffverbindungen für die Nährstoffbelastung von Gewässern, chemische und biologische Charakterisierung und Klassifizierung von Gewässern, Ursachen und Folgen der Gewässerversauerung, hygienische Belastung, Trinkwasserversorgung und -aufbereitung, mechanische, biologische und chemische Abwasserklärung, hormonell wirksame Substanzen

VL Biologische Bedeutung von Schwebstoffen

Herkunft, Klassifizierung und Verteilung von Schwebstoffen in Gewässern, Analytik der Zusammensetzung von Schwebstoffen, Transport und Sedimentation von Schwebstoffen, Aggregation von Primärpartikeln und Aggregatbildungsmechanismen, Fallbeispiele von Aggregationsereignissen, mikrobielle Besiedlung von und mikrobielle Stoffumsatzaktivität auf Schwebstoffen, Strukturanalyse von Schwebstoff-assoziierten Bakteriengemeinschaften.

Reader's advisory

VL Grundlagen des Gewässerschutzes

Skript vorhanden, wird auf Stud.IP hochgeladen.

Dokulil, M., Hamm, A., Kohl, J.G. Ökologie und Schutz von Seen. Facultas Universitätsverlag, Wien 2001.

Fent K., Ökotoxikologie, Thieme Verlag, Stuttgart 1998.

Frimmel, F.H., Wasser und Gewässer, ein Handbuch, Spektrum Verlag, Heidelberg 1999.

Gunkel, G., Bioindikation in aquatischen Ökosystemen, Gustav Fischer Verlag, Jena 1994.

Gunkel, G., Renaturierung kleiner Fließgewässer, Gustav Fischer Verlag, Jena 1996.

Lozan, J.L. et al., Warnsignale aus der Nordsee, Paul Parey Verlag, Hamburg 1990.

Lozan, J.L. et al., Warnsignale aus der Ostsee, Paul Parey Verlag, Hamburg 1996.

Mudrack, K., Kunst, S., Biologie der Abwasserreinigung, Gustav Fischer Verlag 1991.

Rohmann, U., Sontheimer, H., Nitrat im Grundwasser, Engler-Bunte-Institut, Universität Karlsruhe 1985.

Schulze, E., Hygienisch-mikrobiologische Wasseruntersuchungen, Gustav Fischer Verlag, Jena 1996.

Schwoerbel, J., Einführung in die Limnologie, Gustav Fischer Verlag, 8. Auflage, Jena 1999.

VL Biologische Bedeutung von Schwebstoffen

Skript vorhanden, wird auf Stud.IP hochgeladen.

Weitere Literatur wird zu Beginn der VL bereitgestellt.

Links		
Languages of instruction	German, English	
Duration (semesters)	2 Semester	
Module frequency	jährlich	
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	Wintersemester: VL Grundlagen des Gewässerschutzes (2 SWS, 3 KP) Sommersemester VL Biologische Bedeutung von Schwebstoffen (2 SWS, 3 KP)	
Vorkenntnisse / Previous knowledge	Nützlich: Allgemeine Biologie, Geochemie, Chemie	
Examination	Time of examination	Type of examination
Final exam of module	Nach Ende der Vorlesungszeit	KL
Course type	Lecture	
SWS	4	
Frequency	SoSe und WiSe	
Workload attendance	56 h	

Vertiefungsmodule zweites Fachsemester

Iök210 - Practice of Nature Conservation

Module label	Practice of Nature Conservation
Module code	Iök210
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester • Master's Programme Sustainability Economics and Management (Master) > Additional Modules • Master's Programme Water and Coastal Management (Master) > Science
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Mose, Ingo (Module responsibility)</p> <p>Buchwald, Rainer (Module counselling)</p> <p>Mose, Ingo (Module counselling)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Dörfler, Inken (Authorized examiners)</p> <p>Mose, Ingo (Authorized examiners)</p> <p>Fartmann, Thomas (Authorized examiners)</p> <p>Tent, Nathalie (Authorized examiners)</p>
Prerequisites	Completed ecology-oriented Bachelor course
Skills to be acquired in this module	<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>
Module contents	<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. this seminar takes place in the winter term</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>
Reader's advisory	<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. & 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. & R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.</p>
Links	https://www.uni-oldenburg.de/vegetationskunde/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	35

Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	V/Ü, S, EX			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	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 of compulsory attendance
Lecture		1		14
Exercises		1		14
Seminar		2		28
Study trip		3		42
Total time of attendance for the module				98 h

lök211 - Practice of Nature Conservation

Module label	Practice of Nature Conservation	
Module code	lök211	
Credit points	9.0 KP	
Workload	270 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 	
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Mose, Ingo (Module responsibility)</p> <p>Buchwald, Rainer (Module counselling)</p> <p>Mose, Ingo (Module counselling)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Dörfler, Inken (Authorized examiners)</p> <p>Fartmann, Thomas (Authorized examiners)</p> <p>Mose, Ingo (Authorized examiners)</p>	
Prerequisites	Completed ecology-oriented Bachelor course	
Skills to be acquired in this module	<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>	
Module contents	<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. this seminar takes place in the winter term</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>	
Reader's advisory	<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. & 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. & R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.</p>	
Links	https://www.uni-oldenburg.de/vegetationskunde/	
Languages of instruction	German, English	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	35	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	V/Ü, S, EX	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination

Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module	9 CP = graded oral examination (Mose/Buchwald), additionally active participation in both seminars		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1		14
Exercises		1		14
Seminar		2		28
Study trip		3		42
Total time of attendance for the module				98 h

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

Module label	Ecology of the Soil-Water-Plant-System			
Module code	lök225			
Credit points	6.0 KP			
Workload	180 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Massmann, Gudrun (Module responsibility)</p> <p>Massmann, Gudrun (Module counselling)</p> <p>Pollmann, Thomas (Module counselling)</p> <p>Caspers, Gerfried (Authorized examiners)</p> <p>Massmann, Gudrun (Authorized examiners)</p> <p>Peppler-Lisbach, Cord (Authorized examiners)</p> <p>Pollmann, Thomas (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<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. Studierende besitzen nach erfolgreichem Besuch des Moduls • vertiefte theoretische Kenntnisse über das Ökosystem Moor • vertiefte bodenkundlich-hydrologische-vegetationsökologische Kenntnisse • vertiefte Kenntnisse ökosystemarer Prozessabläufe • vertiefte Kenntnisse bezüglich aktueller Forschungsthemen [nop] ++ 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 [/nop]</p>			
Module contents	<ul style="list-style-type: none"> • Applied Peat Ecology (Ex) • Ecology of Peatlands (S) 			
Reader's advisory	Literatur wird je nach Entwicklung des Forschungsfeldes im Rahmen der Vorbereitung zum Seminar bekannt gegeben.			
Links	https://uol.de/hydrogeologie/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	24			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	S / EX			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Veranstaltungsende		PS	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar		2	SoSe und WiSe	28
Study trip		2	SoSe und WiSe	28
Total time of attendance for the module				56 h

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

Module label	Ecology of the Soil-Water-Plant-System			
Module code	lök229			
Credit points	9.0 KP			
Workload	270 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Massmann, Gudrun (Module responsibility)</p> <p>Massmann, Gudrun (Module counselling)</p> <p>Pollmann, Thomas (Module counselling)</p> <p>Caspers, Gerfried (Authorized examiners)</p> <p>Massmann, Gudrun (Authorized examiners)</p> <p>Peppler-Lisbach, Cord (Authorized examiners)</p> <p>Pollmann, Thomas (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<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. Studierende besitzen nach erfolgreichem Besuch des Moduls</p> <ul style="list-style-type: none"> • Handlungswissen über bodenkundlich-hydrologische-vegetationsökologische Feldaufnahmen • Vertiefte Kenntnisse in der Laboranalyse von Boden-, Pflanzen- und Wasserproben • vertiefte Kenntnisse ökosystemarer Prozessabläufe • vertiefte Kenntnisse bezüglich aktueller Forschungsthemen • vertiefte Kenntnisse in der Anwendung von GIS [nop] ++ 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 [/nop] 			
Module contents	<ul style="list-style-type: none"> • Field and laboratory work soil-water-plant system (Ü) • Interdisciplinary analysis of ecosystem processes and water and nutrient transport in landscapes (S) 			
Reader's advisory	Literatur wird je nach Entwicklung des Forschungsfeldes im Rahmen der Vorbereitung zum Seminar bekannt gegeben.			
Links	https://uol.de/hydrogeologie/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	8			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	Ü / S			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Veranstaltungsende	HA		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Seminar		4	SoSe und WiSe	56
Exercises		2	SoSe und WiSe	28

Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Total time of attendance for the module				84 h

Iök230 - Aquatic Ecology

Module label	Aquatic Ecology			
Module code	Iök230			
Credit points	9.0 KP			
Workload	270 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Kiel, Ellen (Module responsibility)</p> <p>Kiel, Ellen (Module counselling)</p> <p>Kiel, Ellen (Authorized examiners)</p>			
Prerequisites	Gewässerökologische Grundkenntnisse (entsprechend den Angeboten B.Sc. UWI)			
Skills to be acquired in this module	<p>The prior goals and themes of this module are:</p> <ul style="list-style-type: none"> - To learn about important parameter and ecological processes of specific aquatic habitats; - learn about threats and important disturbance factors; - work independently on scientific question; - learn methods and learn how to apply specific methods in field and in the laboratory experiments; - start to development methods on your own; - analyse the field and laboratory data, and apply modern statistical methods; - start critical analysis and discussion of field and laboratory data; - learn to develop mapping and assessment methods; - study principles of typology and models describing selected systems; - learn how to deal with nature conservation conflicts by referring to experimental field and laboratory data. 			
Module contents	<p>3 courses:</p> <p>1. Lowland Waters (3 CP); 2. Bioassessment (3 CP); 3. Field Experiments (3 CP)</p>			
Reader's advisory	Relevant literature will be made available in advance via StudIP and during the course.			
Links	https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	20			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	V, S, Ü			
Vorkenntnisse / Previous knowledge	Theorie u. Methoden der aquatischen Ökologie			
Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module	1 assignment (English, publication form)		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2	SuSe	28
Exercises		2	SuSe	28
Seminar		2	SuSe	28
Total time of attendance for the module				84 h

lök240 - Functional ecology of communities in heterogeneous landscapes

Module label	Functional ecology of communities in heterogeneous landscapes			
Module code	lök240			
Credit points	15.0 KP			
Workload	450 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Kleyer, Michael (Module responsibility)</p> <p>Kleyer, Michael (Module counselling)</p> <p>Kleyer, Michael (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<p>Upon successful completion of the module students will gain:</p> <ul style="list-style-type: none"> Technical skills in ecological field experiments, determination of plants in the field, phytosociological records, soil inventories, biomass determination and determination of biological characteristics Technical skills in laboratory work, statistics Skills in mapping plants and animals, application of GIS, spatial statistics Advanced knowledge of spatial ecology and the conditions of survival in heterogeneous landscapes as well as knowledge of functional ecology; assessment of academic voids between theory and empiricism Skills in independently dealing with ecological literature and information, respectively <p>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.</p>			
Module contents	<ul style="list-style-type: none"> Practical training in the field and in the laboratory, practical training in statistics Functional ecology of communities in spatio-temporally heterogeneous landscapes: Literature analyses Functional plant ecology: Biological characteristics related to disturbances and soil resources (laboratory analyses, statistical analysis) 			
Reader's advisory	Literature will be announced during the preparatory course and is contingent on the latest developments in the research field.			
Links	https://www.uni-oldenburg.de/en/landeco/			
Language of instruction	English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Veranstaltungsende	a) Seminar paper (weighting 20 %) b) Specialized practical exercise (weighting 80 %)		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Exercises		8		112
Seminar		2		28
Total time of attendance for the module				140 h

lök250 - Functional Ecology of Plants

Module label	Functional Ecology of Plants			
Module code	lök250			
Credit points	15.0 KP			
Workload	450 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Zotz, Gerhard Wolfgang (Module responsibility)</p> <p>Zotz, Gerhard Wolfgang (Module counselling)</p> <p>Einzmann, Helena (Authorized examiners)</p> <p>Zotz, Gerhard Wolfgang (Authorized examiners)</p> <p>Hoeber, Vincent (Authorized examiners)</p> <p>Will, Maria (Authorized examiners)</p>			
Prerequisites	none			
Skills to be acquired in this module	Lecture: Special subjects of Functional Ecology of Plants are dealt with in detail giving the students a general idea of recent research in the field. Seminar: Giving seminar papers based on own or other people's research allows the improvement of presentation skills. Practical work: Project work including independent planning, performance, analysis, and presentation will familiarize students with the scientific method.			
Module contents	L: "Scaling": Physiological Ecology from individual organ to ecosystem SE: Recent studies in experimental ecology E: Independent research project			
Reader's advisory	<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>			
Links	https://www.uni-oldenburg.de/en/biology/functional-ecology/			
Language of instruction	English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Reference text	http://www.uni-oldenburg.de/fun_eco/			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	V, S, Ü			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module			Two seminar papers (30%) Project report (70%)	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		10		140
Seminar		2		28
Total time of attendance for the module				196 h

lök260 - Restoration of Terrestrial Ecosystems

Module label	Restoration of Terrestrial Ecosystems			
Module code	lök260			
Credit points	6.0 KP			
Workload	180 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Buchwald, Rainer (Module counselling)</p>			
Prerequisites	Basic knowledge in Ecology, Vegetation Science, and Zoology, comparable to the respective Bachelor modules in Environmental Sciences			
Skills to be acquired in this module	<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>			
Module contents	<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>			
Reader's advisory	<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. & Wiegand, 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. & Davy, A.J.: Handbook of ecological restoration; 2 volumes. Cambridge 2002.</p> <p>Additional literature will be announced during the course, if necessary.</p>			
Links	https://www.uni-oldenburg.de/vegetationskunde/			
Language of instruction	English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	V(S, Ü)			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		Seminar paper or assignment	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		2		28
Seminar				
Total time of attendance for the module				56 h

lök270 - Landscape Management Support Planning

Module label	Landscape Management Support Planning			
Module code	lök270			
Credit points	15.0 KP			
Workload	450 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Kleyer, Michael (Module responsibility)</p> <p>Kleyer, Michael (Module counselling)</p> <p>Kleyer, Michael (Authorized examiners)</p>			
Prerequisites				
Skills to be acquired in this module	<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"> • Technical skills in mapping plants and animals in landscapes: Records, sorting of records for preparing mapping keys; field mapping. • Technical skills in landscape management support planning including GIS analysis, evaluation of the compensation of environmental impacts on selected ecosystem compartments, and planning of compensation and mitigation <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>			
Module contents	Mapping results obtained in the field study are fed into GIS, compensation and mitigation measures are planned, and finally the impacts are balanced by the compensation measures.			
Reader's advisory	Relevant literature will be announced during the preparatory course and is contingent on the latest developments in the research field. Additionally, a script for the exercise will be handed over to the participants.			
Links	https://www.uni-oldenburg.de/en/landeco/			
Language of instruction	German			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Reference text	Medienformen: Geländearbeit, GIS-Arbeit, Präsentation der Inhalte über Beamer, Folie und Tafel, Selbststudium mit dem e-learning System www.GIMOLUS.de ,			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	Ü, S			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module	Specialized practical exercise		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Exercises		10		140
Seminar		1	SoSe und WiSe	14
Total time of attendance for the module				154 h

lök280 - Special Vegetation Ecology

Module label	Special Vegetation Ecology	
Module code	lök280	
Credit points	6.0 KP	
Workload	180 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 	
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Peppler-Lisbach, Cord (Module responsibility)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Dörfler, Inken (Authorized examiners)</p> <p>Peppler-Lisbach, Cord (Authorized examiners)</p> <p>Buchwald, Rainer (Module counselling)</p>	
Prerequisites	Completed Bachelor studies with ecological orientation	
Skills to be acquired in this module	The module qualifies the participants to extend their knowledge acquired in their ecologically oriented Master studies of Landscape Ecology. This comprises advanced knowledge of the flora and vegetation types in Central Europe as well as the acquisition of additional methods in vegetation ecology	
Module contents	In the summer term, the module (6 CP) includes a one-week field course in a selected Central European natural landscape focussing on floristic, vegetation ecological, phytosociological (syntaxonomical) aspects as well as on aspects of biocoenology and nature conservation.	
Reader's advisory	<p>Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart.</p> <p>Ellenberg, H. & Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart.</p> <p>Frey, W. & 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>	
Links	https://www.uni-oldenburg.de/vegetationskunde/	
Language of instruction	German	
Duration (semesters)	2 Semester	
Module frequency	jährlich	
Module capacity	unlimited	
Reference text	The field course in this module is also part of the 9CP module lök285 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method		
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Assignment
Course type	Exercises	
SWS	4	
Frequency		
Workload attendance	56 h	

lök285 - Special Vegetation Ecology

Module label	Special Vegetation Ecology			
Module code	lök285			
Credit points	9.0 KP			
Workload	270 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 			
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Peppler-Lisbach, Cord (Module responsibility)</p> <p>Buchwald, Rainer (Module counselling)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Peppler-Lisbach, Cord (Authorized examiners)</p>			
Prerequisites	Completed Bachelor studies with ecological orientation			
Skills to be acquired in this module	The module qualifies the participants to extend their knowledge acquired in their ecologically oriented Master studies of Landscape Ecology. This comprises advanced knowledge of the flora and vegetation types in Central Europe as well as the acquisition of additional methods in vegetation ecology.			
Module contents	<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>			
Reader's advisory	<p>Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart.</p> <p>Ellenberg, H. & Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart.</p> <p>Frey, W. & 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>			
Links	https://www.uni-oldenburg.de/vegetationskunde/			
Language of instruction	German			
Duration (semesters)	2 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Reference text	The field work is also part of the 6 CP module lök280 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module	Oral examination or assignment		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		4		56
Total time of attendance for the module				84 h

lök290 - Perspectives of Bioenergy

Module label	Perspectives of Bioenergy			
Module code	lök290			
Credit points	6.0 KP			
Workload	180 h			
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester • Master's Programme Water and Coastal Management (Master) > Science 			
Responsible persons	<p>Buchwald, Rainer (Module responsibility)</p> <p>Buchwald, Rainer (Module counselling)</p> <p>Klenke, Thomas (Module counselling)</p> <p>Wark, Michael (Module counselling)</p> <p>Klenke, Thomas (Authorized examiners)</p> <p>Röhrdanz, Kai Michael (Authorized examiners)</p> <p>Buchwald, Rainer (Authorized examiners)</p> <p>Pehlken, Alexandra (Authorized examiners)</p> <p>Wark, Michael (Authorized examiners)</p>			
Prerequisites	Bachelor studies of Natural Science, Environmental Science or Economics			
Skills to be acquired in this module	The module qualifies students to deal with the different forms of bioenergy and their current perspectives. Hereby, they acquire competences in the scientific basal subjects of physics, chemistry, and biology as well as with respect to the energetic, technical, ecological, and economic aspects that have to be considered for a synoptic assessment of different forms of bioenergy.			
Module contents	<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)</p> <p>b) Seminar "Formen und Beispiele der Bioenergie" (wahlweise zu c)</p> <p>c) Übung "Praktische Bioenergie" (wahlweise zu b)</p>			
Reader's advisory				
Links	https://www.uni-oldenburg.de/vegetationskunde/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module	Assignment (for the seminar or for the exercise, alternatively) and presentation of 30 min. for a) not marked		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Exercises		2		28
Seminar		2		28
Total time of attendance for the module				84 h

lök215 - Ornithologische Bestandsschätzungen

Module label	Ornithologische Bestandsschätzungen	
Module code	lök215	
Credit points	6.0 KP	
Workload	180 h	
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule zweites Fachsemester 	
Responsible persons	Schmaljohann, Heiko (Module responsibility) Schmaljohann, Heiko (Module counselling) Schmaljohann, Heiko (Authorized examiners)	
Prerequisites		
Skills to be acquired in this module		
Module contents		
Reader's advisory		
Links		
Language of instruction	German	
Duration (semesters)	1 Semester	
Module frequency		
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method		
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module		2 Prüfungsleistungen: - Hausarbeit (70%) - Referat (30%)
Course type	Course selection	
SWS	4	
Frequency	SoSe oder WiSe	
Workload attendance	56 h	

Vertiefungsmodule drittes Fachsemester

lök310 - Group Project: Sustainable Spatial Development

Module label	Group Project: Sustainable Spatial Development	
Module code	lök310	
Credit points	9.0 KP	
Workload	270 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester 	
Responsible persons	<p>Mose, Ingo (Module responsibility)</p> <p>Mose, Ingo (Module counselling)</p> <p>Schaal, Peter (Module counselling)</p> <p>Mose, Ingo (Authorized examiners)</p> <p>Schaal, Peter (Authorized examiners)</p> <p>Tent, Nathalie (Authorized examiners)</p>	
Prerequisites	Participation in the module Environmental Planning	
Skills to be acquired in this module	Upon successful completion of the module the students will have gained various skills in the independent use and application of planning methods to develop appropriate solutions to selected problems in spatial planning and regional development, additionally experiences will be gained in organizing group work and the successful integration of individual tasks in a wider project context	
Module contents	Review of theoretical knowledge in spatial and environmental planning based on a specific planning task reflecting or integrating practical requirements.	
Reader's advisory	Literature will be announced during the lectures.	
Links		
Language of instruction	German	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method		
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Special exercise (70%) und presentation (30%)
Course type	Project group	
SWS	6	
Frequency		
Workload attendance	84 h	

lök320 - Sustainable Spatial Development in Europe

Module label	Sustainable Spatial Development in Europe
Module code	lök320
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester • Master's Programme Sustainability Economics and Management (Master) > Additional Modules • Master's Programme Water and Coastal Management (Master) > Planning
Responsible persons	<p>Mose, Ingo (Module responsibility)</p> <p>Mose, Ingo (Module counselling)</p> <p>Mose, Ingo (Authorized examiners)</p> <p>Klenke, Thomas (Authorized examiners)</p> <p>Kramer, Nadine (Authorized examiners)</p> <p>Prinz, Markus (Authorized examiners)</p> <p>Schaal, Peter (Authorized examiners)</p>
Prerequisites	Good command of English
Skills to be acquired in this module	Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context. Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.
Module contents	<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>
Reader's advisory	<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>Lossau, J.; Freytag, T.; Lippuner, R. (Hrsg.): Schlüsselbegriffe der Kultur- und Sozialgeographie. Stuttgart 2014</p>

Schmied, D. (ed.): Winning and losing. The changing geography of Europe's rural areas.

Additional literature will be announced in the seminars.

Links	https://www.uni-oldenburg.de/en/geo/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method	S			
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		6 CP = Report or assignment	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Seminar		6		84
Study trip		2		28
Total time of attendance for the module				140 h

lök321 - Sustainable Spatial Development in Europe

Module label	Sustainable Spatial Development in Europe
Module code	lök321
Credit points	9.0 KP
Workload	270 h
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodul drittes Fachsemester
Responsible persons	<p>Mose, Ingo (Module responsibility)</p> <p>Mose, Ingo (Module counselling)</p> <p>Klenke, Thomas (Authorized examiners)</p> <p>Kramer, Nadine (Authorized examiners)</p> <p>Mose, Ingo (Authorized examiners)</p> <p>Prinz, Markus (Authorized examiners)</p> <p>Schaal, Peter (Authorized examiners)</p>
Prerequisites	Good command of English
Skills to be acquired in this module	Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context. Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.
Module contents	<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>
Reader's advisory	<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>
Links	https://www.uni-oldenburg.de/en/geo/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited

Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		9 CP = Report or assignment or oral examination (extended version)	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		2		28
Seminar		6		84
Study trip		2		28
Total time of attendance for the module				140 h

Iök345 - Advanced Limnology

Module label	Advanced Limnology			
Module code	Iök345			
Credit points	6.0 KP			
Workload	180 h			
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodul drittes Fachsemester 			
Responsible persons	<p>Kiel, Ellen (Module responsibility)</p> <p>Niedringhaus, Rolf (Module responsibility)</p> <p>Kiel, Ellen (Module counselling)</p> <p>Niedringhaus, Rolf (Module counselling)</p> <p>Kiel, Ellen (Authorized examiners)</p> <p>Niedringhaus, Rolf (Authorized examiners)</p>			
Prerequisites	Basic knowledge of taxonomy + determination of mainly invertebrates, basic skills in faunistic field methods, L Animal Ecology			
Skills to be acquired in this module	<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>			
Module contents	<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>			
Reader's advisory	See announcements in StudIP			
Links	https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/			
Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Reference text	The courses of this module are integrated into Iök350 "Special Animal Ecology" (9 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination	Type of examination		
Final exam of module	Before the end of the module.	Special exercise or Assignment		
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1		14

Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Exercises		3		42
Total time of attendance for the module				56 h

lök350 - Advanced Animal Ecology

Module label	Advanced Animal Ecology
Module code	lök350
Credit points	9.0 KP
Workload	270 h
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodul drittes Fachsemester
Responsible persons	<p>Niedringhaus, Rolf (Module responsibility)</p> <p>Kiel, Ellen (Module responsibility)</p> <p>Kiel, Ellen (Authorized examiners)</p> <p>Niedringhaus, Rolf (Authorized examiners)</p> <p>Kiel, Ellen (Module counselling)</p> <p>Niedringhaus, Rolf (Module counselling)</p>
Prerequisites	Basic knowledge of taxonomy + determination of mainly vertebrates, basic skills in faunistic field methods, L Animal Ecology
Skills to be acquired in this module	<p>L Special Aquatic Ecology The module imparts general and special knowledge of the ecology of typical floodplain water systems with special emphasis on floodplain dynamics and the resulting processes related to those water systems. Floodplain development and (faunistic) biodiversity are further main topics comprising e.g. the explanation of ecological conditions and colonisation processes and referring to questions of nature protection, examining the habitat preference of selected species and describing the population development of typical floodplain species.</p> <p>E Special Aquatic Ecology Familiarization with the course of a planning process on the basis of an exemplary project in North-west Germany; independent development of a concept of methods for assessing the faunistic actual state and subsequent realization in the field; scientific documentation and ecologically relevant assessment of the situation in the project area using selected indicator groups (scientific determination of selected taxa); preparation of final expert opinions on the project</p> <p>L Applied Animal Ecology 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>
Module contents	<p>L Special Aquatic Ecology Ecology of typical floodplain water systems (mainly old water bodies and temporary water bodies); description of the decisive processes in floodplain and water system dynamics as well as the 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 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>L Applied Animal Ecology 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>
Reader's advisory	See announcements in StudIP
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	Special Animal Ecology (9 CP) integrates the courses of the module Special Aquatic Ecology (6 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.
Modullevel / module level	MM (Mastermodul / Master module)

Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		Special exercise or Assignment	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		3		42
Exercises		3		42
Total time of attendance for the module				84 h

lök360 - Special Abiotic Factors (Soil/Water)

Module label	Special Abiotic Factors (Soil/Water)
Module code	lök360
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester
Responsible persons	<p>Greskowiak, Janek (Module responsibility)</p> <p>Greskowiak, Janek (Module counselling)</p> <p>Kalinina, Olga (Module counselling)</p> <p>Massmann, Gudrun (Module counselling)</p> <p>Greskowiak, Janek (Authorized examiners)</p> <p>Kalinina, Olga (Authorized examiners)</p> <p>Massmann, Gudrun (Authorized examiners)</p>
Prerequisites	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
Skills to be acquired in this module	<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>
Module contents	<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 (http://www.simcore.com): 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 (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/)</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>
Reader's advisory	<p>-Appelo, C.A.J. & 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"> Zech, W. & Hintermaier-Erhard, G. (2002): Böden der Welt. Spektrum Akademischer Verlag, Heidelberg, Berlin. IUSS Working Group WRB. 2014. World Reference Base for Soil Resources 2014. <p>International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; www.fao.org/3/a-i3794e.pdf -see also announcements in StudIP</p>
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester

Module frequency	jährlich			
Module capacity	unlimited			
Reference text	The module can be taken as a 6 CP or a 9 CP module. For the 6 CP module, 2 of the 4 courses offered must be attended, for the 9 CP module, 3 of the 4 courses			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge	Grundkenntnisse der Bodenkunde, Hydrogeologie und Hydrochemie.			
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		Oral examination or assignment	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1	--	14
Exercises		3	--	42
Total time of attendance for the module				56 h

lök365 - Special Abiotic Factors (Soil/Water)

Module label	Special Abiotic Factors (Soil/Water)
Module code	lök365
Credit points	9.0 KP
Workload	270 h
Applicability of the module	<ul style="list-style-type: none">• Master's Programme Landscape Ecology (Master) > Vertiefungsmodul drittes Fachsemester
Responsible persons	<p>Greskowiak, Janek (Module responsibility)</p> <p>Greskowiak, Janek (Module counselling)</p> <p>Kalinina, Olga (Module counselling)</p> <p>Massmann, Gudrun (Module counselling)</p> <p>Greskowiak, Janek (Authorized examiners)</p> <p>Kalinina, Olga (Authorized examiners)</p> <p>Massmann, Gudrun (Authorized examiners)</p> <p>Pollmann, Thomas (Authorized examiners)</p>
Prerequisites	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
Skills to be acquired in this module	<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 (http://www.simcore.com): 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 (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/)</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>
Module contents	<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 (http://www.simcore.com): 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 (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/)</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>
Reader's advisory	<p>-Appelo, C.A.J. & 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">• Zech, W. & Hintermaier-Erhard, G. (2002): Böden der Welt. Spektrum Akademischer Verlag, Heidelberg, Berlin.• IUSS Working Group WRB. 2014. World Reference Base for Soil Resources 2014. <p>International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; www.fao.org/3/a-i3794e.pdf</p> <p>-see also announcements in StudIP.</p>

Links

Languages of instruction	German, English			
Duration (semesters)	1 Semester			
Module frequency	jährlich			
Module capacity	unlimited			
Reference text	The module can be taken as a 6 CP or a 9 CP module. For the 6 CP module, 2 of the 4 courses offered must be attended, for the 9 CP module, 3 of the 4 courses.			
Modullevel / module level	MM (Mastermodul / Master module)			
Modulart / typ of module	Wahlpflicht / Elective			
Lehr-/Lernform / Teaching/Learning method				
Vorkenntnisse / Previous knowledge	Grundkenntnisse der Bodenkunde, Hydrogeologie und Hydrochemie.			
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		Oral examination or housework	
Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1.5	--	21
Exercises		4.5	--	63
Total time of attendance for the module				84 h

Iök370 - Ornithology

Module label	Ornithology	
Module code	Iök370	
Credit points	6.0 KP	
Workload	180 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester 	
Responsible persons	<p>Liedvogel, Miriam (Module responsibility)</p> <p>Klump, Georg Martin (Module counselling)</p> <p>Liedvogel, Miriam (Module counselling)</p> <p>Bouwhuis, Sandra (Authorized examiners)</p> <p>Klump, Georg Martin (Authorized examiners)</p> <p>Köppl, Christine (Authorized examiners)</p> <p>Langemann, Ulrike (Authorized examiners)</p> <p>Liedvogel, Miriam (Authorized examiners)</p> <p>Mouritsen, Henrik (Authorized examiners)</p> <p>Schmaljohann, Heiko (Authorized examiners)</p>	
Prerequisites		
Skills to be acquired in this module	<p>The module imparts advanced knowledge on different aspects of ornithology. The students acquire:</p> <ul style="list-style-type: none"> An extended knowledge of morphological and physiological fundamentals and the resulting ecological and behaviour-biological consequences in birds Knowledge, presentation and discussion of relevant English literature from various fields of ornithology 	
Module contents	<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>	
Reader's advisory	<p>Bairlein F (1996) Ökologie der Vögel. G. Fischer, Stuttgart.</p> <p>Bennett PM, Owens IPF (2002) Evolutionary Ecology of birds: Life histories, mating systems, and extinction. Oxford</p> <p>Berthold P (1996) Control of bird migration. Chapman & Hall, London.</p> <p>Brooke M, Birkhead T (1991) The Cambridge Encyclopedia of Ornithology. Cambridge UP, Cambridge.</p> <p>Carey C (1996) Avian energetics and nutritional ecology. Chapman & Hall, New York.</p> <p>Catchpole CK, Slater PJB (1995) Bird song. Cambridge UP, Cambridge.</p> <p>Danchin E, Giraldeau L-A, Cézilly F (2008) Behavioural Ecology. Oxford</p> <p>Farner DS, King JR (eds., 1971-1993) Avian Biology. Vol. I-IX. Academic Press, New York.</p> <p>Furness RW, Monaghan P (1987) Seabird Ecology. Blackie, Glasgow.</p> <p>Gill FB (1990) Ornithology. Freeman, New York.</p> <p>Newton I (2008) The Migration Ecology of Birds. Academic Press, Amsterdam.</p> <p>Podulka S, Rohrbaugh RW, Bonney R (2004) Handbook of Bird Biology. Cornell Lab of Ornithology, Ithaca.</p> <p>Scanes CG (2015) Sturkie's Avian Physiology, 6th edition. Academic Press</p> <p>Scott G (2010) Essential Ornithology. Oxford University Press, Oxford</p>	
Links		
Languages of instruction	German, English	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	30	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	V, S	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Written exam in the last week of the term	Written examinaion

Course type	Lecture
SWS	4
Frequency	SoSe oder WiSe
Workload attendance	56 h

lök375 - Advanced Ornithology

Module label	Advanced Ornithology
Module code	lök375
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none">• Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester
Responsible persons	Liedvogel, Miriam (Module responsibility) Klump, Georg Martin (Module counselling) Liedvogel, Miriam (Module counselling) Bouwhuis, Sandra (Authorized examiners) Klump, Georg Martin (Authorized examiners) Langemann, Ulrike (Authorized examiners) Liedvogel, Miriam (Authorized examiners) Schmaljohann, Heiko (Authorized examiners) Vedder, Oscar Herman (Authorized examiners)

Prerequisites

Skills to be acquired in this module Ziel dieses Moduls ist die Vertiefung verschiedener Aspekte der Ornithologie sowie die Vermittlung aktueller Methoden aus der ornithologischen Forschung.

++ 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

Module contents

Das Modul besteht aus vier Wahlpflichtveranstaltungen (je 6 KP), von denen eines gewählt werden muss.

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 Studierendenden 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 verstehen. 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.

Wahlpflicht B: Praktikum und Seminar "Kommunikation der Vögel" (6 KP).
In diesem Praktikum erhalten Sie digitale Aufnahmen von Vogelgesängen, die in Rahmen eines früheren Forschungsprojektes gesammelt wurden. Aus diesen Aufnahmen gewinnen Sie ihren eigenen Datensatz 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.

Wahlpflicht C: Praktikum und Seminar "Ernährungsphysiologie der Vögel" (6 KP).

Im Praktikum werden die grundsätzlichen Fragen und Methoden der Ernährung von Vögeln in eigenständigen Experimenten im Labor und in Freilandbeobachtungen behandelt. Die Laboruntersuchungen erfolgen an Singvögeln, die Freilanduntersuchungen vornehmlich an Gänsen und Limikolen. Schwerpunkte des Praktikums wie des Seminars sind Aspekte der Stoffwechselphysiologie, wie Respiration, 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.

Reader's advisory	<p>Bairlein F (1996) Ökologie der Vögel. G. Fischer, Stuttgart.</p> <p>Bennett PM, Owens IPF (2002) Evolutionary Ecology of birds: Life histories, mating systems, and extinction. Oxford</p> <p>Bibby, CJ, Burgess, ND, Hill, DA. 1995. Methoden der Feldornithologie. Bestandserfassung in der Praxis. Neumann Verlag. Radebeul.</p> <p>Brooke M, Birkhead T (1991) The Cambridge Encyclopedia of Ornithology. Cambridge UP, Cambridge.</p> <p>Catchpole CK, Slater PJB (1995) Bird song. Cambridge UP, Cambridge.</p> <p>Danchin E, Giraldeau L-A, Cézilly F (2008) Behavioural Ecology. Oxford</p> <p>Podulka S, Rohrbaugh RW, Bonney R (2004) Handbook of Bird Biology. Cornell Lab of Ornithology, Ithaca.</p> <p>Scanes CG (2015) Sturkie's Avian Physiology, 6th edition. Academic Press (an imprint of Elsevier)</p> <p>Scott G (2010) Essential Ornithology. Oxford University Press, Oxford.</p> <p>Südbeck, P, Andretzke, H, Fischer, S, Gedeon, K, Schikore, T, Schröder, K, Sudfeldt, C. 2005. Methodenstandards zur Erfassung der Brutvögel Deutschlands. Radolfzell.</p> <p>Sutherland, WJ, Newton, I, Green RE. 2004. Bird ecology and conservation. Oxford University Press. New York</p>
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Links		
Languages of instruction	German, English	
Duration (semesters)	1 Semester	
Module frequency	jährlich	
Module capacity	12	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Wahlpflicht / Elective	
Lehr-/Lernform / Teaching/Learning method	PR, S	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	PT	
Course type	Practical training	
SWS	4	
Frequency	SoSe oder WiSe	
Workload attendance	56 h	

lök390 - Experimental designs in ecological field studies

Module label	Experimental designs in ecological field studies
Module code	lök390
Credit points	6.0 KP
Workload	180 h
Applicability of the module	<ul style="list-style-type: none"> • Master's Programme Landscape Ecology (Master) > Vertiefungsmodule drittes Fachsemester
Responsible persons	<p>Kiel, Ellen (Module responsibility)</p> <p>Kiel, Ellen (Module counselling)</p> <p>Kiel, Ellen (Authorized examiners)</p>
Prerequisites	<ul style="list-style-type: none"> • Basic courses of Ecology (1st and 2nd semesters LÖK) • Skills in determining aquatic organisms, e.g. via Bachelor modules <ul style="list-style-type: none"> o Knowledge of forms o Running water ecology o Aquatic habitats o Master course in the module "Aquatic Ecology" o Comparable courses at other universities
Skills to be acquired in this module	<ul style="list-style-type: none"> - Qualification to independently plan field experiments suitable for answering current ecological questions (individuals, populations, communities) - Methodological competence/independence in performing field experiments - Qualification to independently analyse the experiments in the laboratory guided by hypotheses and using adequate methods, materials and statistical methods - Competence in presenting results on a scientific level (scientific report presenting and discussing the method; scientific publication; both in English) - Impartment of manifold methodological skills in the field of aquatic ecology, experimental field research (autecological, population-ecological and synecological research approaches) - Impartment of extended expertise in planning experiments in general and their analysis in the field of animal ecology (application and linking of acquired skills; generalisable knowledge) - Practical experience in analysing field experiments in general (comprising laboratory phases, access to literature and databases, preparation of scientific publications) - Preparation of Master and Ph.D. theses requiring skills in experimental field research
Module contents	<p>1st course phase (theoretical preparation and planning)</p> <ul style="list-style-type: none"> - Picking up current ecological research topics related to aquatic habitats, e.g. in streams and ditches (the respective system is selected prior to the start of the course and should change) - Specification of questions and frame conditions by the course lecturer concerning current research questions in the fields of autecology, population ecology, and synecology - Instructions for literature research and the respective analysis by students - Summary and presentation of the current standard of knowledge (structured brief reviews presented to the course participants by students and commented by the lecturer as well as preparation of a synopsis as part of the term paper or the oral examination (see below)) - Concrete formulation of questions and working hypotheses based on literature research <p>2nd course phase (practical preparation and planning; laboratory and field work)</p> <ul style="list-style-type: none"> - Preparatory inspection of the investigation area accompanied by the lecturer - Independent development of a concept of methods (advised by the lecturer) - Presentation of the planned experiment and of the analysis (treatment of samples, data processing etc.) - Independent practical preparation of experiments (calibrate equipment, prepare solutions, prepare trapping jars, determine aquatic data etc.), analysis steps (e.g. prepare laboratory equipment), and logistics (transportation, entry permissions etc.) - Description of methods for all working steps in writing - Independent realization of planning (advised by lecturer) - Report on all procedures including reflection <p>3rd course phase (further development and application of acquired knowledge; theoretical phase)</p> <ul style="list-style-type: none"> - Common discussion about the possibilities of and limits to applying the procedure to concrete questions concerning other habitats, other animal associations etc.
Reader's advisory	<p>Hauer, F. Richard & Lamberti, Gary A. (2007): Methods in Stream Ecology (Elsevier Inc.) Methods in Ecology and Evolution (British Ecological Society): http://www.methodsinecologyandevolution.org/view/0/index.html TIEE: http://www.esa.org/tiee/misc/about.html</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>
Links	https://www.uni-oldenburg.de/en/biology/aquatic-ecology-and-nature-conservation/
Language of instruction	English
Duration (semesters)	2 Semester

Module frequency	jährlich
Module capacity	unlimited
Reference text	Independent literature research on specific questions and methods by students.
Modullevel / module level	MM (Mastermodul / Master module)
Modulart / typ of module	Wahlpflicht / Elective

Lehr-/Lernform / Teaching/Learning method

Vorkenntnisse / Previous knowledge

Examination	Time of examination	Type of examination
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Final exam of module	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)
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Course type	Comment	SWS	Frequency	Workload of compulsory attendance
Lecture		1		14
Exercises		3		42
Total time of attendance for the module				56 h

Abschlussmodul

mam - Master's Degree Module

Module label	Master's Degree Module	
Module code	mam	
Credit points	30.0 KP	
Workload	900 h	
Applicability of the module	<ul style="list-style-type: none"> Master's Programme Landscape Ecology (Master) > Abschlussmodul 	
Responsible persons	der Landschaftsoekologie, Lehrende (Authorized examiners)	
Prerequisites		
Skills to be acquired in this module	Successful completion of the Master module demonstrates that students are able to work on a problem in the field of Landscape Ecology within a fixed period applying scientific methods.	
Module contents	E: Preparing the Master thesis SE: Active participation in the seminar of the research group, in which the Master thesis is written.	
Reader's advisory	Supervisors may supply an initial reading list with important literature. The students are expected to find and use further literature as needed.	
Links		
Languages of instruction		
Duration (semesters)	1 Semester	
Module frequency	semiannual	
Module capacity	unlimited	
Modullevel / module level	MM (Mastermodul / Master module)	
Modulart / typ of module	Pflicht / Mandatory	
Lehr-/Lernform / Teaching/Learning method	S (angeleitete selbständige Arbeit)	
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Master's Thesis (80%) Oral examination (20%)	
Course type	Seminar	
SWS	2	
Frequency		
Workload attendance	28 h	

