Modules for Landscape Ecology

Date 24/07/19

Basismodule

lök100 - Data Modelling

Module label	Data Modelling
Module code	lök100
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master Landschaftsökologie > Basismodule
Contact person	Module responsibility ◦ Vanessa Minden Authorized examiners ◦ Vanessa Minden ◦ Cord Peppler-Lisbach Module counceling ◦ Vanessa Minden
Entry requirements	
Skills to be acquired in this module	• Basic methods of explorative statistics and adequate application of statistical tests relevant to ecological data. • To learn, interpret and apply methods of habitat modelling • To understand the fundamentals of spatial explicit analysis of species-environment relationships as well as the fundamentals of spatial prediction of environmental requirements in species • To adequately analyse measured and observed spatial data applying methods of spatial statistics and geostatistics, respectively • To learn and to understand relevant methods of multivariate analysis of vegetation data • To be able to interpret and to assess the results obtained as well as the relevant literature • To be able to apply the treated methods independently • To learn and to improve skills in using the statistics software R
Module contents	Part 1: Introduction to statistical analysis of ecological data NN (NN) • Experimental design • Explorative data analysis • Distribution tests, data transformation • Chi² test • Anova, Kruskal-Wallis test • t & U test • Multiple comparisons, post-hoc tests Part 2: Habitat modelling and spatial statistics (Biedermann) • Linear (OLS) regression • GLM (logistic regression, Poisson regression) • Spatial explicit modelling, GIS integration • Spatial statistics Part 3: Multivariate analysis of vegetation ecological data (Peppler-Lisbach) Classification: • Cluster analysis • Statistical degrees of fidelity Ordination: • Indirect procedures: PCA, CA, DCA • Canonical procedures: RDA, CCA

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	MM (Mastermodul / Master module)	
Modulart	Wahlpflicht / Elective	
Lern-/Lehrform / Type of program		
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	6.00	
Frequency	WiSe	
Workload attendance	84 h	

lök110 - Ecology

Module label	Ecology
Module code	lök110
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Basismodule
Contact person	Module responsibility ◦ Michael Kleyer Authorized examiners ◦ Michael Kleyer ◦ Gerhard Wolfgang Zotz ◦ Ellen Kiel Module counceling ◦ Gerhard Wolfgang Zotz ◦ Ellen Kiel ◦ Michael Kleyer
Entry requirements	Knowledge of phytosociology, zoo-ecology, pedology and ecology, comparable to the corresponding modules of BSc. Environmental Sciences
Skills to be acquired in this module	Qualification imparted to students: Upon successful completion of the module the students will gain: • a thorough knowledge of environmental conditions and biological mechanisms enabling plant species to survive in landscapes • a thorough knowledge of the eco-physiology of plants in landscapes • a thorough knowledge of the environmental conditions and biological mechanisms enabling animals to survive in landscapes Ranking/position of the module within the course of studies: In the initial phase of the Master programme, this module imparts theories and models of the conditions of survival in plant and animals species as well as of the abiotic/biotic interdependencies in heterogenous landscapes. In combination with other compulsory modules it serves to give students a survey of the special field of Landscape Ecology and to enable them to competently select advanced modules in the following semesters.
Module contents	Ecology of plants in landscapes Eco-physiology of plants in landscapes Ecology of animals in landscapes
Reader's advisory	Literature will be announced during the course.
Links	https://www.uni-oldenburg.de/en/landeco/
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

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

Course type	Lecture
SWS	3.00
Frequency	
Workload attendance	42 h

lök120 - Geoecological Processes

Module label	Geoecological Processes
Module code	lök120
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Basismodule
Contact person	Module responsibility ◦ Luise Dorothee Giani Authorized examiners ◦ Holger Freund ◦ Luise Dorothee Giani ◦ Gudrun Massmann
Entry requirements	
Skills to be acquired in this module	Upon successful completion of the module the students will gain: - advanced skills in analysing a landscape unit - a thorough knowledge of geological, pedological, hydrological, hydrogeological, and botanical relationships within an ecosystem - a thorough knowledge of the genesis and properties of Northwest German soils - a thorough knowledge of hydrological and hydrogeological properties of Northwest Germany - a fundamental knowledge of national and international soil systematics - the qualification to ecologically record and assess soils (including humus form) - the ability to perform soil ecological interpretations
Module contents	Landscape unitSpiekeroog (EX/E) Special Pedology (L) Special Hydrogeology (L) Pedological field work (E)
Reader's advisory	Literature will be announced during the lecture.
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	30
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	V/Ü/EX
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Writtenexamination

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises		2.00	WiSe	28 h
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
Used in course of study	• Master Landschaftsökologie > Basismodule • Master Sustainability Economics and Management > Ergänzungsmodule
Contact person	Module responsibility ◦ Peter Schaal Authorized examiners ◦ Luise Dorothee Giani ◦ Peter Schaal ◦ Thomas Lecke-Lopatta Module counceling ◦ Peter Schaal
Entry requirements	Basic knowledge of environmental planning. Students who have not gained such basic knowledge during the Bachelor course please contact the persons responsible for the module in order to evaluate possibilities for catching up relevant knowledge.
Skills to be acquired in this module	The students will • gain advanced knowledge into the formal and informal organization of spatial developmental processes in a combination of disciplinary and interdisciplinary concepts; • get to know the system of privileged planning combined with cross-section planning as well as investigate and assess possible deductions for concrete decision making; • elaborate case studies and typical planning problems in seminar papers and develop their own positions regarding the instruments; • get to know assessment methods for all important ecosystem compartments and gain the skills to deduce ecosystem services from ecosystem functions. Ranking and position of the module within the course of studies: The module offers fundamental and advanced knowledge in the first semester on the basis of which planning exercises can be performed during the Master courses
Module contents	a) Development of models and assessment of ecosystem functions for environmental planning: Presentation of theoretical concepts and practicable methods applied to assess ecosystem functions b) Actor-oriented planning instruments: Presentation of aims, forms and mechanisms of formal and informal instruments of area and environmental planning considering participative forms of the actor in different frameworks c) Special planning: Presentation of legal grounds, organization, instruments and practical methods of planning institutions including negative or positive impacts on the environmental quality for humans and nature. Possibilities of influencing the planning results from the point of view of precautionary environmental protection d) Conservation and Evaluation of Soils: Presentation of legal grounds, practical methods and opportunities for soil protection and soil evaluation in regional and environmental planning.
Reader's advisory	Akademie für Raumforschung und Landesplanung (ed.): Handwörterbuch der Raumordnung, Hannover 1995. Benz, A.: Governance. Regieren in komplexen Regelsystemen. Eine Einführung. 2nd edition.Wiesbaden 2010. Grundwasserbewirtschaftungsplan Hessisches Ried. Darmstadt 1999. Moseley, M.J. (Ed.): Local Partnerships for Rural Development. The European Experience. Cambridge 2003. Pütz, M.; Buchholz, K.-H. (2003): Anzeige- und Genehmigungsverfahren nach dem Bundes-Immissionsschutzgesetz. 7th edition. Berlin. Wikipedia: http://de.wikipedia.org/wiki/Fachplanung Additional literature will be announced during the lectures.
Links	https://www.uni-oldenburg.de/en/landeco/
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht

Lern-/Lehrform / Type of program		
Vorkenntnisse / Previous knowledge		
Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Seminar paper
Course type	Seminar	
SWS	6.00	
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
Used in course of study	• Master Landschaftsökologie > Basismodule
Contact person	Module responsibility ◦ Peter Schaal Authorized examiners ◦ Peter Schaal ◦ Christian Aden Module counceling ◦ Peter Schaal ◦ Christian Aden
Entry requirements	
Skills to be acquired in this module	
Module contents	
Reader's advisory	
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	
Module capacity	30
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		Ü

Course type	Exercises
SWS	4.00
Frequency	SuSe or 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
Used in course of study	• Master Landschaftsökologie > Basismodule
Contact person	Module responsibility ◦ Peter Schaal Authorized examiners ◦ Peter Schaal ◦ Christian Aden Module counceling ◦ Peter Schaal
Entry requirements	
Skills to be acquired in this module	
Module contents	
Reader's advisory	
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	
Module capacity	30
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		Ü

Course type	Exercises
SWS	4.00
Frequency	SuSe or WiSe
Workload attendance	56 h

Vertiefungsmodule zweites Fachsemester

lök210 - Practice of Nature Conservation

Module label	Practice of Nature Conservation
Module code	lök210
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester • Master Sustainability Economics and Management > Ergänzungsmodule • Master Water and Coastal Management > Bereich Science
Contact person	Module responsibility ◦ Rainer Buchwald ◦ Ingo Mose Authorized examiners ◦ Rainer Buchwald ◦ Ingo Mose ◦ Thomas Fartmann ◦ Robert Sprenger
Entry requirements	Completed ecology-oriented Bachelor course
Skills to be acquired in this module	With the successful completion of the module the students will gain a general and advanced knowledge of crucial approaches and instruments of nature conservation in Germany and Europe, especially of the implementation of large protected areas (NSG, biosphere reserve, national park etc.), of maintenance/management projects and measures as well as of approaches to their integration into nature conservation and regional development strategies (via agriculture, tourism etc.) in co-operation with national park administrative authorities and other relevant actors. Additionally, the module gives basic skills in developing ecological connectivity systems (example dragonflies) as well as in developing and implementing approaches to ecological planning inside and outside the nature reserves. Ranking/position of the module within the course of studies: The module focuses on problems, methods, results, and analyses relevant to nature conservation and refers to corresponding issues of modules in Bachelor courses as well as of basic modules in Master courses of Landscape Ecology.
Module contents	a) Seminar "Protected areas and regional development": Survey of the most important types of large protected areas in Europe as well as current concepts of integrating the purposes of conservation with the tasks of regional development especially in peripheral rural areas b) Seminar "Introduction to the German Nature Conservation Law": This course deals with some parts of the Nature Conservation Law of Germany and Lower Saxony and discusses their relevance to the actual Nature Conservation policy in Northwest-Germany. **this seminar takes place in the winter term** c) Field course “Habitat connectivity": Theory of ecological connectivity including causes and impacts of fragmentation and isolation in nature-near biotopes; investigation of migration and dispersal behaviour in selected dragonfly species of ditch systems d) Excursion "Protected areas": Presentation of a selected large protected area in Germany or Europe especially considering geographical, floristic, faunistic, historical, agricultural, and nature conservation aspects as well as aspects of landscape and economics
Reader's advisory	Amler, K. et al. (1999): Populationsbiologie in der Praxis. Stuttgart. Corbet, Ph. S. (1999): Dragonflies: Behaviour and ecology of Odonata. Chichester. Hammer, T. (ed., 2003): Großschutzgebiete - Instrumente nachhaltiger Entwicklung. München. Jedicke, E. (1990): Biotopverbund. Stuttgart. Jessel, B. & K. Tobias (2002): Ökologisch orientierte Planung. Stuttgart. Köppel, J. et al. (1998): Praxis der Eingriffsregelung. Stuttgart. Mose, I. (ed., 2007): Protected areas and regional development in Europe. Aldershot. Sternberg, K. & R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	35
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
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	6 CP = Paper (in the course of a seminar) or excursion report or assignment

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		1.00		14 h
Exercises		1.00		14 h
Seminar		2.00		28 h
Study trip		3.00		42 h
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Rainer Buchwald ◦ Ingo Mose Authorized examiners ◦ Rainer Buchwald ◦ Ingo Mose ◦ Thomas Fartmann ◦ Robert Sprenger
Entry requirements	Completed ecology-oriented Bachelor course
Skills to be acquired in this module	With the successful completion of the module the students will gain a general and advanced knowledge of crucial approaches and instruments of nature conservation in Germany and Europe, especially of the implementation of large protected areas (NSG, biosphere reserve, national park etc.), of maintenance/management projects and measures as well as of approaches to their integration into nature conservation and regional development strategies (via agriculture, tourism etc.) in co-operation with national park administrative authorities and other relevant actors. Additionally, the module gives basic skills in developing ecological connectivity systems (example dragonflies) as well as in developing and implementing approaches to ecological planning inside and outside the nature reserves. Ranking/position of the module within the course of studies: The module focuses on problems, methods, results, and analyses relevant to nature conservation and refers to corresponding issues of modules in Bachelor courses as well as of basic modules in Master courses of Landscape Ecology.
Module contents	a) Seminar "Protected areas and regional development": Survey of the most important types of large protected areas in Europe as well as current concepts of integrating the purposes of conservation with the tasks of regional development especially in peripheral rural areas b) Seminar "Introduction to the German Nature Conservation Law": This course deals with some parts of the Nature Conservation Law of Germany and Lower Saxony and discusses their relevance to the actual Nature Conservation policy in Northwest-Germany. **this seminar takes place in the winter term** c) Fieldcourse “Habitat connectivity": Theory of ecological connectivity including causes and impacts of fragmentation and isolation in nature-near biotopes; investigation of migration and dispersal behaviour in selected dragonfly species of ditch systems d) Excursion "Protected areas": Presentation of a selected large protected area in Germany or Europe especially considering geographical, floristic, faunistic, historical, agricultural, and nature conservation aspects as well as aspects of landscape and economics
Reader's advisory	Amler, K. et al. (1999): Populationsbiologie in der Praxis. Stuttgart. Corbet, Ph. S. (1999): Dragonflies: Behaviour and ecology of Odonata. Chichester. Hammer, T. (ed., 2003): Großschutzgebiete - Instrumente nachhaltiger Entwicklung. München. Jedicke, E. (1990): Biotopverbund. Stuttgart. Jessel, B. & K. Tobias (2002): Ökologisch orientierte Planung. Stuttgart. Köppel, J. et al. (1998): Praxis der Eingriffsregelung. Stuttgart. Mose, I. (ed., 2007): Protected areas and regional development in Europe. Aldershot. Sternberg, K. & R. Buchwald (1999/2000): Die Libellen Baden-Württembergs; 2 volumes. Stuttgart.
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	35
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	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 attendance
Lecture		1.00		14 h

Course type	Comment	SWS	Frequency	Workload attendance
Exercises		1.00		14 h
Seminar		2.00		28 h
Study trip		3.00		42 h
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Gudrun Massmann Authorized examiners ◦ Gudrun Massmann ◦ Luise Dorothee Giani ◦ Cord Peppler-Lisbach ◦ Gerfried Caspers Module counceling ◦ Luise Dorothee Giani ◦ Gudrun Massmann
Entry requirements	
Skills to be acquired in this module	
Module contents	
Reader's advisory	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	15
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		PS

Course type	Comment	SWS	Frequency	Workload attendance
Seminar		2.00	SuSe and WiSe	28 h
Study trip		2.00	SuSe and WiSe	28 h
Total time of attendance for the module				56 h

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

Module label	Ecology of the Soil-Water-Plant-System
Module code	lök229
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Gudrun Massmann Authorized examiners ◦ Gudrun Massmann ◦ Luise Dorothee Giani ◦ Gerfried Caspers ◦ Cord Peppler-Lisbach Module counceling ◦ Luise Dorothee Giani ◦ Gudrun Massmann
Entry requirements	
Skills to be acquired in this module	
Module contents	
Reader's advisory	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	8
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		HA

Course type	Comment	SWS	Frequency	Workload attendance
Seminar		4.00	SuSe and WiSe	56 h
Exercises		2.00	SuSe and WiSe	28 h
Total time of attendance for the module				84 h

lök230 - Aquatic Ecology

Module label	Aquatic Ecology
Module code	lök230
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Ellen Kiel Authorized examiners ◦ Ellen Kiel
Entry requirements	
Skills to be acquired in this module	The prior goals and themes of this module are: - To learn about important parameter and ecological processes of specific aquatic habitats; - learn about threats and important disturbance factors; - work independently on scientific question; - learn methods and learn how to apply specific methods in field and in the laboratory experiments; - start to development methods on your own; - analyse the field and laboratory data, and apply modern statistical methods; - start critical analysis and discussion of field and laboratory data; - learn to develop mapping and assessment methods; - study principles of typology and models describing selected systems; - learn how to deal with nature conservation conflicts by referring to experimental field and laboratory data.
Module contents	3 courses: 1. Lowland Waters (3 CP); 2. Bioassessment (3 CP); 3. Field Experiments (3 CP)
Reader's advisory	Relevant literature will be made available in advance via StudIP and during the course.
Links	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	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	V/S/Ü
Vorkenntnisse / Previous knowledge	

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 attendance
Lecture		2.00	SuSe	28 h
Exercises		2.00	SuSe	28 h
Seminar		2.00	SuSe	28 h
Total time of attendance for the module				84 h

lök240 - Functional ecology of communities in heterogeneous landscapes

Module label	Functional ecology of communities in heterogeneous landscapes
Module code	lök240
Credit points	15.0 KP
Workload	450 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Michael Kleyer Authorized examiners ◦ Michael Kleyer
Entry requirements	
Skills to be acquired in this module	Upon successful completion of the module students will gain: • Technical skills in ecological field experiments, determination of plants in the field, phytosociological records, soil inventories, biomass determination and determination of biological characteristics - Technical skills in laboratory work, statistics • Skills in mapping plants and animals, application of GIS, spatial statistics • Advanced knowledge of spatial ecology and the conditions of survival in heterogeneous landscapes as well as knowledge of functional ecology; assessment of academic voids between theory and empiricism • Skills in independently dealing with ecological literature and information, respectively Ranking/position of the module within the course of studies: The module imparts action-oriented and theoretical knowledge of the conditions of survival in plant and animal species in heterogeneous landscapes. It serves the prognosis of impacts on the biodiversity caused by environmental changes. This represents a crucial qualification for environmental planning and habitat restitution projects.
Module contents	• Practical training in the field and in the laboratory, practical training in statistics • Functional ecology of communities in spatio-temporally heterogeneous landscapes: Literature analyses • Functional plant ecology: Biological characteristics related to disturbances and soil resources (laboratory analyses, statistical analysis)
Reader's advisory	Literature will be announced during the preparatory course and is contingent on the latest developments in the research field.
Links	https://www.uni-oldenburg.de/en/landeco/
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	S/Ü
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		a) Seminar paper (weighting 20 %) b) Specialized practical exercise (weighting 80 %)

Course type	Comment	SWS	Frequency	Workload attendance
Exercises		8.00		112 h
Seminar		2.00		28 h
Total time of attendance for the module				140 h

lök250 - Functional Ecology of Plants

Module label	Functional Ecology of Plants
Module code	lök250
Credit points	15.0 KP
Workload	450 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Gerhard Wolfgang Zotz Authorized examiners ◦ Gerhard Wolfgang Zotz ◦ Helena Einzmann ◦ Vincent Hoeber ◦ Maria Will
Entry requirements	none
Skills to be acquired in this module	Lecture: Special subjects of Functional Ecology of Plants are dealt with in detail giving the students a general idea of recent research in the field. Seminar: Giving seminar papers based on own or other people´s research allows the improvement of presentation skills. Practical work: Project work including independent planning, performance, analysis, and presentation will familiarize students with the scientific method.
Module contents	L: ”Scaling“: Physiological Ecology from individual organ to ecosystem SE: Recent studies in experimental ecology E: Independent research project
Reader's advisory	von Willert, D. J., R. Matyssek and W. Herppich (1995). Experimentelle Pflanzenökologie. Stuttgart, Thieme Verlag Lambers, H., F. S. Chapin III and T. L. Pons (2008). Plant Physiological Ecology. New York, Springer. Schulze, E. D., E. Beck and K. Müller-Hohenstein (2002). Pflanzenökologie. Berlin, Springer. Additional literature will be announced during the module and is contingent on the latest developments in the research field.
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	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	V/S/PR
Vorkenntnisse / Previous knowledge	

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

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises		10.00		140 h
Seminar		2.00		28 h
Total time of attendance for the module				196 h

lök260 - Restoration of Terrestrial Ecosystems

Module label	Restoration of Terrestrial Ecosystems
Module code	lök260
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Rainer Buchwald Authorized examiners ◦ Rainer Buchwald
Entry requirements	Basic knowledge in Ecology, Vegetation Science, and Zoology, comparable to the respective Bachelor modules in Environmental Sciences
Skills to be acquired in this module	The participants will become acquainted with the possibilities and limits of renaturation and restoration projects in terrestrial ecosystems. This implies an extensive knowledge in autecology and population ecology of selected species on the one hand; on the other hand, monitoring by means of hydrological and/or pedological parameters as well as based on the vegetation and selected animal groups is crucial for evaluating such projects. In cooperation with the respective project management, student groups will contribute to the evaluation and advancement of the respective project as well as similar project(s) by performing individual records, analyses and assessments. 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.
Module contents	Theory and Practice of Restoration Ecology (L): The lecture deals with the fundamentals of Restoration Ecology and exemplarily with the biotope systems fen and bog, grassland and heath. Restoration of Terrestrial Ecosystems (LC): The participants collect data contributing to the evaluation of current restoration projects (Hudewald, mesophilic grassland, heath, oligotrophic stagnant waters).
Reader's advisory	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. & Wiegleb, G. (Hrsg.): Renaturierung von Ökosystemen in Mitteleuropa. Heidelberg 2009. Schopp-Guth, A.: Renaturierung von Moorlandschaften. Bonn 1999. Nick, K.J. et al.: Moorregeneration im Leegmoor/Emsland nach Schwarztorfabbau und Wiedervernässung. Bonn 2001. Wheeler, B.D.. et al.: Restoration of temperate wetlands. Baffins Lane u.a. 1995. Perrow, M.R. & Davy, A.J.: Handbook of ecological restoration; 2 volumes. Cambridge 2002. Additional literature will be announced during the course, if necessary.
Links	
Language of instruction	English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Seminar paper or assignment

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises		2.00		28 h
Seminar				0 h
Total time of attendance for the module				56 h

lök270 - Landscape Management Support Planning

Module label	Landscape Management Support Planning
Module code	lök270
Credit points	15.0 KP
Workload	450 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Michael Kleyer Authorized examiners ◦ Michael Kleyer
Entry requirements	
Skills to be acquired in this module	The landscape management support plan aims at compensating for any project-related impacts on the environment. The mitigation and compensation plan is the outcome of a planning process which will be trained in this course. Upon successful completion of the module students will gain: • Technical skills in mapping plants and animals in landscapes: Records, sorting of records for preparing mapping keys; field mapping. • Technical skills in landscape management support planning including GIS analysis, evaluation of the compensation of environmental impacts on selected ecosystem compartments, and planning of compensation and mitigation 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.
Module contents	Mapping results obtained in the field study are fed into GIS, compensation and mitigation measures are planned, and finally the impacts are balanced by the compensation measures.
Reader's advisory	Relevant literature will be announced during the preparatory course and is contingent on the latest developments in the research field. Additionally, a script for the exercise will be handed over to the participants.
Links	https://www.uni-oldenburg.de/en/landeco/
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	Ü
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Specialized practical exercise

Course type	Comment	SWS	Frequency	Workload attendance
Exercises		10.00		140 h
Seminar		1.00	SuSe and WiSe	14 h
Total time of attendance for the module				154 h

lök280 - Special Vegetation Ecology

Module label	Special Vegetation Ecology
Module code	lök280
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Rainer Buchwald ◦ Cord Peppler-Lisbach Authorized examiners ◦ Rainer Buchwald ◦ Cord Peppler-Lisbach Module counceling ◦ Rainer Buchwald
Entry requirements	Completed Bachelor studies with ecological orien-tation
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	Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart. Ellenberg, H. & Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart. Frey, W. & Lösch, R. (2010): Lehrbuch der Geobotanik. 3rd edition, Stuttgart and others. Pott, R. (1995): Die Pflanzengesellschaften Deutschlands. 2nd edition; Stuttgart. Van der Maarel, E. (ed.) (2005): Vegetation Ecology; Malden. Wilmanns, O. (1998): Ökologische Pflanzensoziologie. 6th edition; Heidelberg.
Links	
Language of instruction	German
Duration (semesters)	2 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	The field course in this module is also part of the 9CP module lök285 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Assignment

Course type	Exercises
SWS	4.00
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester
Contact person	Module responsibility ◦ Rainer Buchwald ◦ Cord Peppler-Lisbach Authorized examiners ◦ Rainer Buchwald ◦ Cord Peppler-Lisbach Module counceling ◦ Rainer Buchwald
Entry requirements	Completed Bachelor studies with ecological orientation
Skills to be acquired in this module	The module qualifies the participants to extend their knowledge acquired in their ecologically oriented Master studies of Landscape Ecology. This comprises advanced knowledge of the flora and vegetation types in Central Europe as well as the acquisition of additional methods in vegetation ecology.
Module contents	Exercise: In the summer term, the module includes, as a compulsory component (6 CP), a one-week field work in a selected Central European natural landscape focussing on floristic, vegetation ecological, phytosociological (syntaxonomical) aspects as well as on aspects of biocoenology and nature conservation. Lecture: Additionally, the lecture "Vegetation Ecology" (3 CP) is offered in the winter term, imparting the fundamentals of development, dynamics, dispersal, site conditions, floristic composition as well as protection of decisive Central European vegetation and biotope types, respectively.
Reader's advisory	Dierschke, H. (1994): Pflanzensoziologie. Grundlagen und Methoden. UTB Große Reihe; Stuttgart. Ellenberg, H. & Leuschner, C. (2010): Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. 6th edition; Stuttgart. Frey, W. & Lösch, R. (2010): Lehrbuch der Geobotanik. 3rd edition, Stuttgart and others. Pott, R. (1995): Die Pflanzengesellschaften Deutschlands. 2nd edition; Stuttgart. Van der Maarel, E. (ed.) (2005): Vegetation Ecology; Malden. Wilmanns, O. (1998): Ökologische Pflanzensoziologie. 6th edition; Heidelberg.
Links	
Language of instruction	German
Duration (semesters)	2 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	The field work is also part of the 6 CP module lök280 "Special Vegetation Ecology". Therefore, it is not possible to register for the modules lök280 and lök285 simultaneously.
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Oral examination or assignment

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Exercises		4.00		56 h
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule zweites Fachsemester • Master Water and Coastal Management > Bereich Science
Contact person	Module responsibility ◦ Rainer Buchwald Authorized examiners ◦ Rainer Buchwald ◦ Luise Dorothee Giani ◦ Megan de Jager ◦ Thomas Klenke ◦ Michael Wark ◦ Kai Michael Röhrdanz Module counceling ◦ Luise Dorothee Giani ◦ Thomas Klenke ◦ Michael Wark
Entry requirements	Bachelor studies of Natural Science, Environmental Science or Economics
Skills to be acquired in this module	The module qualifies students to deal with the different forms of bioenergy and their current perspec-tives. Hereby, they acquire competences in the scientific basal subjects of physics, chemistry, and biology as well as with respect to the energetic, technical, ecological, and economic aspects that have to be considered for a synoptic assessment of different forms of bioenergy.
Module contents	
Reader's advisory	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	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 attendance
Lecture		2.00		28 h
Exercises		2.00		28 h
Seminar		2.00		28 h
Total time of attendance for the module				84 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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Ingo Mose Authorized examiners ◦ Ingo Mose ◦ Peter Schaal Module counceling ◦ Peter Schaal
Entry requirements	Participation in the module Environmental Planning
Skills to be acquired in this module	Upon successful completion of the module the students will have gained various skills in the independent use and application of planning methods to develop appropriate solutions to selected problems in spatial planning and regional development, additionally experiences will be gained in organizing group work and the successful integration of individual tasks in a wider project context
Module contents	Review of theoretical knowledge in spatial and environmental planning based on a specific planning task reflecting or integrating practical requirements.
Reader's advisory	Literature will be announced during the lectures.
Links	
Language of instruction	German
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	P
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	Project paper including presentation

Course type	Project group
SWS	6.00
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester • Master Sustainability Economics and Management > Ergänzungsmodule • Master Water and Coastal Management > Bereich Planning
Contact person	Module responsibility ◦ Ingo Mose Authorized examiners ◦ Ingo Mose ◦ Thomas Klenke ◦ Markus Prinz ◦ Peter Schaal Module counceling ◦ Ingo Mose
Entry requirements	Good command of English
Skills to be acquired in this module	Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context. Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.
Module contents	SE/EX Multifunctionality and rural development (3 CP) V Topical issues of agriculture and nutrition (1.5 CP) SE/EX Sustainable tourism (3 CP) SE/EX Renewable energy planning (3 CP) V Colloquium on sustainable spatial development (1.5 CP) SE Special subject job market: Job market and inequality in Europe (3 CP) – This course (1.07.211 / FK I) takes place in the summer semester. Multifunctionality and rural development Survey of the multifunctionality of rural areas, especially the importance of agriculture and forestry, tourism and recreational activities, habitation, and protection of nature as well as the demands on spatial planning and regional development involved under the conditions of sustainability. Illustration by means of selected examples in a European context. Agriculture and agricultural policy Survey of EU agricultural policy programmes and their strategic-instrumental implementation as well as of selected topics of current developments in agriculture presented by various guest lecturers. Sustainable tourism Presentation of various concepts of sustainable tourism and its realization from the viewpoint of offer and demand. Illustration by means of selected examples in a European context. Renewable energy planning Survey of different forms of renewable energy and related demands on spatial development seen from a mainly planning and actor-orientated point of view. Illustration by means of selected examples in a European context. Colloquium on sustainable spatial development Survey of up-to-date theoretical approaches, concepts, instruments as well as practical fields of activities in sustainable spatial development in a national and European context. Special subject job market: Job market and inequality This course (1.07.211 / FK I) takes place in the summer semester. Three one-day excursions with varying emphasis will be performed in the vicinity of Oldenburg as an integral part of the module seminars.
Reader's advisory	Akademie für Raumforschung und Landesplanung (Hrsg.): Handwörterbuch der Raumordnung. Hannover 2017. Cloke, P.; Marsden, T.; Mooney, P.H. (eds.): Handbook of rural studies. London 2006. Ermann, U. et al.: Agro-Food Studies. Eine Einführung. Köln 2018 Fischer, A.: Sustainable Tourism. Bern 2014. Grabski-Kieron, U.; Mose, I.; Reichert-Schick, A.; Steinführer, A. (eds.): European rural peripheries revalued. Governance, actors, impacts. Münster 2016. Küster, H.: Die Entdeckung der Landschaft. Einführung in eine neue Wissenschaft. München 2012. Lossau, J.; Freytag, T.; Lippuner, R. (Hrsg.): Schlüsselbegriffe der Kultur- und Sozialgeographie. Stuttgart 2014 Schmied, D. (ed.): Winning and losing. The changing geography of Europe´s rural areas.

	Additional literature will be announced in the seminars.
Links	https://www.uni-oldenburg.de/en/geo/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Before the end of the module	6 CP = Report or assignment

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Seminar		6.00		84 h
Study trip		2.00		28 h
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Ingo Mose Authorized examiners ◦ Ingo Mose ◦ Thomas Klenke ◦ Markus Prinz ◦ Peter Schaal
Entry requirements	Good command of English
Skills to be acquired in this module	Presentation and critical reflection of crucial demands of a sustainable spatial development in selected fields of activities especially considering rural development. Comparison of suitable case studies in a European context. Knowledge into central control instruments of structural, regional, and agricultural policy on a national as well as on a European level. Considering specific demands of spatial development in the context of political and social processes of Europeanization.
Module contents	SE/EX Multifunctionality and rural development (3 CP) V Topical issues of agriculture and agricultural policy (1.5 CP) SE/EX Sustainable tourism (3 CP) SE/EX Renewable energy planning (3 CP) V Colloquium on sustainable spatial development (1.5 CP) SE Special subject job market: Job market and inequality in Europe (3 CP) – This course (1.07.211 / FK I) takes place in the summer semester. Multifunctionality and rural development Survey of the multifunctionality of rural areas, especially the importance of agriculture and forestry, tourism and recreational activities, habitation, and protection of nature as well as the demands on spatial planning and regional development involved under the conditions of sustainability. Illustration by means of selected examples in a European context. Agriculture and agricultural policy Survey of EU agricultural policy programmes and their strategic-instrumental implementation as well as of selected topics of current developments in agriculture presented by various guest lecturers. Sustainable tourism Presentation of various concepts of sustainable tourism and its realization from the viewpoint of offer and demand. Illustration by means of selected examples in a European context. Renewable energy planning Survey of different forms of renewable energy and related demands on spatial development seen from a mainly planning and actor-orientated point of view. Illustration by means of selected examples in a European context. Colloquium on sustainable spatial development Survey of up-to-date theoretical approaches, concepts, instruments as well as practical fields of activities in sustainable spatial development in a national and European context. Special subject job market: Job market and inequality This course (1.07.211 / FK I) takes place in the summer semester. Three one-day excursions with varying emphasis will be performed in the vicinity of Oldenburg as an integral part of the module seminars.
Reader's advisory	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.
Links	https://www.uni-oldenburg.de/en/geo/
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht

Lern-/Lehrform / Type of program				
Vorkenntnisse / Previous knowledge				
Examination	Time of examination		Type of examination	
Final exam of module	Before the end of the module		9 CP = Report or assignment or oral examination (extended version)	
Course type	Comment	SWS	Frequency	Workload attendance
Lecture		2.00		28 h
Seminar		6.00		84 h
Study trip		2.00		28 h
Total time of attendance for the module				140 h

lök345 - Advanced Limnology

Module label	Advanced Limnology
Module code	lök345
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Rolf Niedringhaus ◦ Ellen Kiel Authorized examiners ◦ Rolf Niedringhaus ◦ Ellen Kiel Module counceling ◦ Rolf Niedringhaus
Entry requirements	Basic knowledge of taxonomy + determination of mainly invertebrates, basic skills in faunistic field methods, L Animal Ecology
Skills to be acquired in this module	Special Aquatic Ecology The module imparts general and special knowledge of the ecology of typical floodplain water systems with special emphasis on floodplain dynamics and the resulting processes related to those water systems. Floodplain development and (faunistic) biodiversity are further main topics comprising e.g. the explanation of ecological conditions and colonisation processes and referring to questions of nature protection, examining the habitat preference of selected species and describing the population development of typical floodplain species. E Special Aquatic Ecology Familiarization with the course of a planning process on the basis of an exemplary project in Northwest Germany; independent development of a concept of methods for assessing the faunistic actual state and subsequent realization in the field; scientific documentation and ecologically relevant assessment of the situation in the project area using selected indicator groups (scientific determination of selected taxa); preparation of final expert opinions on the project
Module contents	L Special Aquatic Ecology Ecology of typical floodplain water systems (mainly oxbow lakes bodies and temporary water bodies); description of the decisive processes in floodplain and water system dynamics as well as the expres-sivity of the (faunistic) biodiversity; description of the ecological conditions and colonisation process-es relevant to questions of nature protection, aspects of biodiversity as well as habitat preference and population development of typical floodplain species. E Special Aquatic Ecology Description of legal and planning procedures based on a case study; development and realization of a concept of methods for assessing the faunistic current status; scientific documentation (determination of taxa), analysis (determination and classification of species-related characteristics of the taxa rele-vant to the planning) and ecologically relevant assessment of the situation in the project area; final expert opinion on the project
Reader's advisory	See announcements in StudIP
Links	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 lök350 "Special Animal Ecology" (9 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	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 attendance
Lecture		1.00		14 h
Exercises		3.00		42 h

Course type	Comment	SWS	Frequency	Workload attendance
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Rolf Niedringhaus ◦ Ellen Kiel Authorized examiners ◦ Ellen Kiel ◦ Rolf Niedringhaus Module counceling ◦ Ellen Kiel
Entry requirements	Basic knowledge of taxonomy + determination of mainly vertebrates, basic skills in faunistic field methods, L Animal Ecology
Skills to be acquired in this module	L Special Aquatic Ecology The module imparts general and special knowledge of the ecology of typical floodplain water systems with special emphasis on floodplain dynamics and the resulting processes related to those water sys-tems. Floodplain development and (faunistic) biodiversity are further main topics comprising e.g. the expla-nation of ecological conditions and colonisation processes and referring to questions of nature protec-tion, examining the habitat preference of selected species and describing the population development of typical floodplain species. E Special Aquatic Ecology Familiarization with the course of a planning process on the basis of an exemplary project in North-west Germany; independent development of a concept of methods for assessing the faunistic actual state and subsequent realization in the field; scientific documentation and ecologically relevant as-sessment of the situation in the project area using selected indicator groups (scientific determination of selected taxa); preparation of final expert opinions on the project L Applied Animal Ecology Qualification for preparing a professional zooecological contribution within the scope of an expert opinion; familiarization with the most important faunistic indicator groups for scientific objectives relevant to a project
Module contents	L Special Aquatic Ecology Ecology of typical floodplain water systems (mainly old water bodies and temporary water bodies); de-scription of the decisive processes in floodplain and water system dynamics as well as the expressivi-ty of the (faunistic) biodiversity; description of the ecological conditions and colonisation processes rele-vant to questions of nature protection, aspects of biodiversity as well as habitat preference and popula-tion development of typical floodplain species. E Special Aquatic Ecology Description of legal and planning procedures based on a case study; development and realization of a concept of methods for assessing the faunistic current status; scientific documentation (determination of taxa), analysis (determination and classification of species-related characteristics of the taxa rele-vant to the planning) and ecologically relevant assessment of the situation in the project area; final expert opin-ion on the project L Applied Animal Ecology Importance of professional zooecological contributions within the scope of ecologically relevant plan-ning; legal and qualified arguments; regulations for the conservation of species under national and international law; faunistic indication: complex of problems related to vicarious species, well-founded selection of indicator groups Principles of developing a concept of sampling and of performing field work; description of standard methods of sampling and analysis, essential aspects of a professional zooecological contribution for an expert opinion on a project; detailed description of the most important faunistic indicator groups for scientific objectives relevant to a project
Reader's advisory	See announcements in StudIP
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	Special Animal Ecology (9 CP) integrates the courses of the module Special Aquatic Ecology (6 CP). Students graduating in Special Animal Ecology cannot graduate in Special Aquatic Ecology.
Modullevel	MM (Mastermodul)

Modulart	Wahlpflicht				
Lern-/Lehrform / Type of program					
Vorkenntnisse / Previous knowledge					
Examination	Time of examination		Type of examination		
Final exam of module	Before the end of the module		Special exercise or Assignment		
Course type	Comment	SWS		Frequency	Workload attendance
Lecture		3.00			42 h
Exercises		3.00			42 h
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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Luise Dorothee Giani ◦ Janek Greskowiak ◦ Birte Junge ◦ Gudrun Massmann Authorized examiners ◦ Luise Dorothee Giani ◦ Janek Greskowiak ◦ Birte Junge ◦ Gudrun Massmann Module counceling ◦ Luise Dorothee Giani ◦ Gudrun Massmann
Entry requirements	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
Skills to be acquired in this module	E: Applied modelling of water and solute transport in groundwater: Impartment of knowledge into quantitative hydrogeology (hydraulics and advection-dispersion). Qualification to develop simple groundwater flow and transport models. E: Hydrochemical modelling of water-rock interactions using PHREEQC: Impartment of knowledge into quantitative hydrogeochemistry and skills in hydrogeochemical modelling. L: Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands): Impartment of knowledge into distribution, properties and classification of soils of the world. Qualification to apply the World Reference Base for Soil Resources (WRB) and to identify the soils of the world. E: Special soil science field and laboratory exercises: Impartment of knowledge into specific field and laboratory methods. Qualification to select and apply specific field and laboratory methods as well as to analyse and interpret results.
Module contents	E: Applied modelling of water and solute transport in groundwater: Performance of a sandbox experiment. Numerical modelling of groundwater flow and solute transport using PMWIN (http://www.simcore.com): Model setup, parameterization and numerical solution of the groundwater flow and advection-dispersion equations. E: Hydrochemical modelling of water-rock interactions using PHREEQC: Modelling of hydrogeochemical processes (speciation reactions and mineral reactions, pyrite oxidation, oxidation of organic matter, redox reactions, ion exchange, equilibrium reactions and reaction kinetics) using the software PHREEQC (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/) L: Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands): Application of the international soil classification system "WRB", step-wise familiarization with soils and their properties as well as with the related landscapes and catenas (from polar to tropical soils), study of varnished profiles of globally distributed soils. E: Special soil science field and laboratory exercises: Selection of current scientific objectives, construction of a sampling and investigation design, performance of field studies (preferably abroad) and laboratory analysis, analysis and interpreation of results.
Reader's advisory	-Appelo, C.A.J. & Postma, D. (2005): Geochemistry, groundwater and pollution.- 2nd edition, A.A. Balkema. -Kinzelbach, W. und Rausch, R. (1995): Grundwassermodellierung - Eine Einführung mit Übungen, Gebrüder Borntraeger Berlin. • 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. International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; www.fao.org/3/a-i3794e.pdf -see also announcements in StudIP
Links	
Languages of instruction	German, English

Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	The module can be taken as a 6 CP or a 9 CP module. For the 6 CP module, 2 of the 4 courses offered must be attended, for the 9 CP module, 3 of the 4 courses
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	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 attendance
Lecture		5.00		70 h
Exercises		5.00		70 h
Total time of attendance for the module				140 h

lök365 - Special Abiotic Factors (Soil/Water)

Module label	Special Abiotic Factors (Soil/Water)
Module code	lök365
Credit points	9.0 KP
Workload	270 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Luise Dorothee Giani ◦ Janek Greskowiak ◦ Birte Junge ◦ Gudrun Massmann Authorized examiners ◦ Luise Dorothee Giani ◦ Janek Greskowiak ◦ Birte Junge ◦ Gudrun Massmann Module counceling ◦ Luise Dorothee Giani ◦ Gudrun Massmann
Entry requirements	Basic knowledge of Soil Science, Hydrogeology and Hydrochemistry
Skills to be acquired in this module	E: Applied modelling of water water and solute transport in groundwater: Performance of a sandbox experiment. Numerical modelling of groundwater flow and solute transport using PMWIN (http://www.simcore.com): Model setup, parameterization and numerical solution of the groundwater flow and advection-dispersion equations. E: Hydrochemical modelling of water-rock interactions using PHREEQC: Modelling of hydrogeochemical processes (speciation reactions and mineral reactions, pyrite oxidation, oxidation of organic matter, redox reactions, ion exchange, equilibrium reactions and reaction kinetics) using the software PHREEQC (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/) L: Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands): Impartment of knowledge into distribution, properties and classification of soils of the world. Qualification to apply the World Reference Base for Soil Resources (WRB) and to identify the soils of the world. E: Special soil science field and laboratory exercises: Impartment of knowledge into specific field and laboratory methods. Qualification to select and apply specific field and laboratory methods as well as to analyse and interpret results.
Module contents	E: Applied modelling of water and substance transfer in ground water: 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. E: Hydrochemical modelling of water-rock interactions using PHREEQC: Modelling of hydrogeochemical processes (speciation reactions and mineral reactions, pyrite oxidation, oxidation of organic substances, redox reactions, ion exchange, balance reactions and reaction kinetics) using the software PHREEQC (http://wwwbrr.cr.usgs.gov/projects/GWC_coupled/phreeqc/) L: Major Soils of the World and excursion to the World Soil Museum in Wageningen (The Netherlands): Application of the international soil classification system "WRB", step-wise familiarization with soils and their properties as well as with the related landscapes and catenas (from polar to tropical soils), study of varnished profiles of globally distributed soils. E: Special soil science field and laboratory exercises: Selection of current scientific objectives, construction of a sampling and investigation design, performance of field studies (preferably abroad) and laboratory analysis, analysis and interpreation of results.
Reader's advisory	-Appelo, C.A.J. & Postma, D. (2005): Geochemistry, groundwater and pollution.- 2nd edition, A.A. Balkema. -Kinzelbach, W. und Rausch, R. (1995): Grundwassermodellierung - Eine Einführung mit Übungen, Gebrüder Borntraeger Berlin. • 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. International soil classification system for naming soils and creating legends for soil maps. World Soil Resources Reports No. 106. FAO, Rom; www.fao.org/3/a-i3794e.pdf

	-see also announcements in StudIP.
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	jährlich
Module capacity	unlimited
Reference text	The module can be taken as a 6 CP or a 9 CP module. For the 6 CP module, 2 of the 4 courses offered must be attended, for the 9 CP module, 3 of the 4 courses.
Modullevel	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	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 attendance
Lecture		5.00		70 h
Exercises		5.00		70 h
Total time of attendance for the module				140 h

lök370 - Ornithology

Module label	Ornithology
Module code	lök370
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Franz Bairlein ◦ Georg Martin Klump Authorized examiners ◦ Franz Bairlein ◦ Sandra Bouwhuis ◦ Georg Martin Klump ◦ Christine Köppl ◦ Ulrike Langemann ◦ Henrik Mouritsen ◦ Heiko Schmaljohann Module counceling ◦ Franz Bairlein ◦ Georg Martin Klump
Entry requirements	
Skills to be acquired in this module	The module imparts advanced knowledge on different aspects of ornithology. The students acquire: • An extended knowledge of morphological and physiological fundamentals and the resulting ecological and behaviour-biological consequences in birds • Knowledge, presentation and discussion of relevant English literature from various fields of ornithology
Module contents	Lecture “Ecology and Physiology of Birds”: This lecture consolidates special aspects of systematics, morphology, physiology, migration, orientation, population biology, communication and behavioural ecology in birds.
Reader's advisory	Bairlein F (1996) Ökologie der Vögel. G. Fischer, Stuttgart. Bennett PM, Owens IPF (2002) Evolutionary Ecology of birds: Life histories, mating systems, and extinction. Oxford Berthold P (1996) Control of bird migration. Chapman & Hall, London. Brooke M, Birkhead T (1991) The Cambridge Encyclopedia of Ornithology. Cambridge UP, Cambridge. Carey C (1996) Avian energetics and nutritional ecology. Chapman & Hall, New York. Catchpole CK, Slater PJB (1995) Bird song. Cambridge UP, Cambridge. Danchin E, Giraldeau L-A, Cezilly F (2008) Behavioural Ecology. Oxford Farner DS, King JR (eds., 1971-1993) Avian Biology. Vol. I-IX. Academic Press, New York. Furness RW, Monaghan P (1987) Seabird Ecology. Blackie, Glasgow. Gill FB (1990) Ornithology. Freeman, New York. Newton I (2008) The Migration Ecology of Birds. Academic Press, Amsterdam. Podulka S, Rohrbaugh RW, Bonney R (2004) Handbook of Bird Biology. Cornell Lab of Ornithology, Ithaca. Scanes CG (2015) Sturkie's Avian Physiology, 6th edition. Academic Press Scott G (2010) Essential Ornithology. Oxford University Press, Oxford
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	30
Modullevel	MM (Mastermodul / Master module)
Modulart	Wahlpflicht / Elective
Lern-/Lehrform / Type of program	V
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	Written exam in the last week of the term	Written examintaion

Course type	Lecture

SWS	4.00
Frequency	SuSe or WiSe
Workload attendance	56 h

lök375 - Advanced Ornithology

Module label	Advanced Ornithology
Module code	lök375
Credit points	6.0 KP
Workload	180 h
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Franz Bairlein ◦ Georg Martin Klump Authorized examiners ◦ Franz Bairlein ◦ Sandra Bouwhuis ◦ Georg Martin Klump ◦ Ulrike Langemann ◦ Heiko Schmaljohann Module counceling ◦ Franz Bairlein ◦ Georg Martin Klump
Entry requirements	
Skills to be acquired in this module	
Module contents	
Reader's advisory	
Links	
Languages of instruction	German, English
Duration (semesters)	1 Semester
Module frequency	
Module capacity	12
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		PT

Course type	Practical
SWS	4.00
Frequency	SuSe or 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
Used in course of study	• Master Landschaftsökologie > Vertiefungsmodule drittes Fachsemester
Contact person	Module responsibility ◦ Ellen Kiel ◦ Ines Wolpmann Authorized examiners ◦ Ellen Kiel ◦ Ines Wolpmann Module counceling ◦ Ellen Kiel
Entry requirements	• Basic courses of Ecology (1st and 2nd semesters LÖK) • Skills in determining aquatic organisms, e.g. via Bachelor modules 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	- Qualification to independently plan field experiments suitable for answering current ecological questions (individuals, populations, communities) - Methodological competence/independence in performing field experiments - Qualification to independently analyse the experiments in the laboratory guided by hypotheses and using adequate methods, materials and statistical methods - Competence in presenting results on a scientific level (scientific report presenting and discussing the method; scientific publication; both in English) - Impartment of manifold methodological skills in the field of aquatic ecology, experimental field research (autecological, population-ecological and synecological research approaches) - Impartment of extended expertise in planning experiments in general and their analysis in the field of animal ecology (application and linking of acquired skills; generalisable knowledge) - Practical experience in analysing field experiments in general (comprising laboratory phases, access to literature and databases, preparation of scientific publications) - Preparation of Master and Ph.D. theses requiring skills in experimental field research
Module contents	1st course phase (theoretical preparation and planning) - Picking up current ecological research topics related to aquatic habitats, e.g. in streams and ditches (the respective system is selected prior to the start of the course and should change) - Specification of questions and frame conditions by the course lecturer concerning current research questions in the fields of autecology, population ecology, and synecology - Instructions for literature research and the respective analysis by students - Summary and presentation of the current standard of knowledge (structured brief reviews presented to the course participants by students and commented by the lecturer as well as preparation of a synopsis as part of the term paper or the oral examination (see below)) - Concrete formulation of questions and working hypotheses based on literature research 2nd course phase (practical preparation and planning; laboratory and field work) - Preparatory inspection of the investigation area accompanied by the lecturer - Independent development of a concept of methods (advised by the lecturer) - Presentation of the planned experiment and of the analysis (treatment of samples, data processing etc.) - Independent practical preparation of experiments (calibrate equipment, prepare solutions, prepare trapping jars, determine aquatic data etc.), analysis steps (e.g. prepare laboratory equipment), and logistics (transportation, entry permissions etc.) - Description of methods for all working steps in writing - Independent realization of planning (advised by lecturer) - Report on all procedures including reflection 3rd course phase (further development and application of acquired knowledge; theoretical phase) - Common discussion about the possibilities of and limits to applying the procedure to concrete questions concerning other habitats, other animal associations etc.
Reader's advisory	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 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.

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	MM (Mastermodul)
Modulart	Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module	as agreed	Oral examination or housework 1) oral or written presentation of the method design 2) documentation of experimental procedure, data analysis and data processing 3) oral or written subject-specific analysis of the planning in respect of the relevant questions and elaborated hypotheses 4) interdisciplinary analysis of the experiments (oral or in writing)

Course type	Comment	SWS	Frequency	Workload attendance
Lecture		1.00		14 h
Exercises		3.00		42 h
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
Used in course of study	• Master Landschaftsökologie > Abschlussmodul
Contact person	Module responsibility ◦ Lehrende der Landschaftsoekologie Authorized examiners ◦ Lehrende der Landschaftsoekologie
Entry requirements	
Skills to be acquired in this module	Successful completion of the Master module demonstrates that students are able to work on a problem in the field of Landscape Ecology within a fixed period applying scientific methods.
Module contents	E: Preparing the Master thesis SE: Active participation in the seminar of the research group, in which the Master thesis is written.
Reader's advisory	Supervisors may supply an initial reading list with important literature. The students are expected to find and use further literature as needed.
Links	
Languages of instruction	
Duration (semesters)	1 Semester
Module frequency	semiannual
Module capacity	unlimited
Modullevel	---
Modulart	je nach Studiengang Pflicht oder Wahlpflicht
Lern-/Lehrform / Type of program	
Vorkenntnisse / Previous knowledge	

Examination	Time of examination	Type of examination
Final exam of module		Master's Thesis (80%) Oral examination (20%)

Course type	Seminar
SWS	2.00
Frequency	
Workload attendance	28 h