

Appendix B: Module Catalogue for the Master's Degree Course in Landscape Ecology and Nature Conservation

The following is a list of the abbreviations used in this document and their meanings:

CE	compulsory elective
ECTS	credits according to the European Credit Transfer System; corresponds to students' workload
*	ungraded type of examination
E	excursion
EY	on offer on even-numbered years
L	lecture
OY	on offer on odd-numbered years
PL	practical lab course
Pr	presentation
Pra	practical
S	seminar
SuSe	summer semester
SWS	<i>Semesterwochenstunde</i> = contact hours per week
WiSe	winter semester

Part 1: Basic modules

Five compulsory basic (core) modules are offered, comprising a total workload of 900 hours (30 ECTS).

Basic module B1: Landscape Ecology and Economics	
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group
Language	English
Qualification objectives	Students will gain knowledge of current conceptual approaches in landscape ecology and expand and apply their micro-economic knowledge in relation to the economic valuation of natural and landscape resources as well as for the valuation of all kinds of landscape interventions.
Module contents	<p>Lecture: Principles of Landscape Ecology</p> <ul style="list-style-type: none"> • Fundamental principles of landscape ecology • Reductionism and emergence / holism and atomism • Hierarchy and landscape units • The ecosystem concept • Concepts of stability and resilience • Self-organisation / self-regulation • Landscape evolution and dynamics in space and time • Landscapes in land-use conflicts

	Lecture: Nature Conservation Economics				
	<ul style="list-style-type: none"> • Economics and the living environment • Global nature and biodiversity conservation strategies • Markets and state interventions in nature and landscape conservation • Public goods, common-pool resources and the management of natural resources • Economics of species conservation and genetic diversity • Economics of conservation areas • Economic principles for valuing goods and services • Agriculture, forestry and conservation • Tourism, leisure and conservation • Payments for ecosystem services • Compensatory measures and emissions trading rights • Cost and benefits of Natura 2000 • Economics of municipality-based conservation • Conservation in developing countries 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Principles of Landscape Ecology (L)	2	30	120	180
	Economics of Conservation (L)	2	30		
Assessment components	Examination and/or graded coursework: 1 oral examination (25 minutes) on the module content				
	Ungraded coursework: -				
Regular examination date	1st semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	Basic knowledge of economics and ecology				
Module can be selected for	M.Sc. LENC				

Basic module B2: Ethics and Environment	
Person responsible	Head of the Environmental Ethics working group
Language	English, German
Qualification objectives	<ul style="list-style-type: none"> • Knowledge of global ecological relationships and the ability to assess human influences on these relationships in a generally comprehensible manner • Familiarity with the terminology, requirements, methods and various concepts in the field of environmental ethics • In-depth understanding of the concept of holistic environmental ethics • Ability to apply independent ethical arguments in different conservation-related contexts

Module contents	<p>Lecture: Global Environmental Problems</p> <ul style="list-style-type: none"> • Characteristics of planet Earth, fundamental stages in the history of the Earth and evolution • The global carbon cycle, the roles of the atmosphere, surface-level ocean and deep ocean environments, land-based biomass, soil and human impacts • Global hydrogen cycle and human influence on it • Global nitrogen (N) and phosphorus (P) cycles in comparison • Energy balance and the global climate • Climate change – natural variability, human influence and ecological effects • Economics of climate change • Alternative energy sources and alternative land-use concepts <p>Lecture: Naturethik [Nature Ethics] (CE) / Seminar: Nature Ethics (CE)</p> <ul style="list-style-type: none"> • Origins of environmental ethics and their fundamental role in assessing and combating environmental problems • Self-understanding and methodology • Natural philosophical, anthropological and epistemological requirements • Terminology and fundamental concepts • Overview of the basic types of environmental ethics and basic ethical concepts • Anthropocentric ethics and the concept of sustainability • Non-anthropocentric approaches • The concept of holistic environmental ethics: justification, consequences, conflicting aims and criteria to consider 				
	Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study
	Global Environmental Problems (L)	2	30	120	180
	Naturethik (L) (CE)	2	30		
	Nature Ethics (S) (CE)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (90 minutes) on the module content				
	Ungraded coursework: -				
Regular examination date	1st semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	Lecture: Theorie und Geschichte der Ökologie [Theory and History of Ecology] (WiSe)				
Module can be selected for	M.Sc. LENC				

Basic module B3: International Excursion					
Person responsible	Chairperson of the Examination Board				
Language	English, German				
Qualification objectives	Students visit a natural and cultural region outside of Germany, familiarise themselves with typical forms of vegetation and land use in the respective country, and gain an understanding of the specific land-use and conservation-related problems.				
Module contents	Excursion: International Excursion <ul style="list-style-type: none"> • Field trip to a location outside Germany • Engagement with the natural environment in the visited country • Engagement with conservation-related problems in the visited country 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	International Excursion (E)	5	75	105	180
Assessment components	Examination and/or graded coursework: 1 report* (10 pages) or 1 presentation* (20 minutes)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Basic module B4: Research Internship					
Person responsible	Chairperson of the Examination Board				
Language	English, German				
Qualification objectives	<ul style="list-style-type: none"> • Advanced theoretical and practical knowledge regarding a specific case / a specific research task • Advanced knowledge and skills for independent academic work and writing academic texts 				
Module contents	<ul style="list-style-type: none"> • Development of a design to solve the assigned task • Advanced introduction to literature studies • Independent research project of limited scope • Evaluation, presentation and discussion of findings in a report 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Research Internship	5		180	180
Assessment components	Examination and/or graded coursework: 1 report (10 pages)				
	Ungraded coursework: -				

Regular examination date	3rd semester
Offered	By arrangement
Duration	1 semester
Admission requirements	None
Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC

Basic module B5: Personal Profile					
Person responsible	Chairperson of the Examination Board				
Language	English, German				
Qualification objectives	Skills or additional qualifications that are related to the subject of the degree course and serve to enhance the student's profile in regard to their employability in academia, associations, industry, business or administration.				
Module contents	<ul style="list-style-type: none"> • Dependent on the student's choice. Students may earn the 6 credits for the module by choosing freely from the modules offered at the University of Greifswald, provided that they have not already studied those modules as part of their undergraduate degree course. • It is recommended that students choose modules that increase their employability, e.g. from the fields of statistics, rhetoric, presentation techniques, law, economics, business administration, educational science or sustainability. 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	6 ECTS of the student's choice				180
Assessment components	Examination and/or graded coursework: 1 report* (10 pages)				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually				
Duration	1 semester (winter semester or summer semester)				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Part 2: Elective Modules

There are 58 elective modules on offer, from which students should select 10 modules comprising a total workload of 1,800 hours (60 ECTS). At least eight of the chosen modules must be graded.

Elective module E1.1: Umweltökonomie [Environmental Economics]					
Person responsible	Head of the General Economics and Landscape Economics working group				
Language	German				
Qualification objectives	Students gain in-depth knowledge of environmental and natural resource economics as well as the ability to analyse environmental problems and policies from an economic perspective. They learn techniques used in scientific work and develop the ability to make judgements in subject and policy-related discussions.				
Module contents	<p>Lecture: Umweltökonomie [Environmental Economics]</p> <ul style="list-style-type: none"> Theoretical approaches in environmental and natural resource economics and ecological economics Theories of external effects, public goods and common-pool resources Rights of disposal, transaction costs, the Coase theorem and Pigouvian taxes Analysis of standard-oriented instruments (i.e. restrictions, charges, certificates) Liability law as an environmental policy instrument International environmental policy, especially climate protection Economic assessment of environmental damage Use of exhaustible resources (i.e. optimal depletion, Hotelling's rule, transition to renewable energy sources) Use of renewable resources (i.e. bioeconomic fundamentals, forest management, fisheries) The sustainability paradigm <p>Seminar: Umweltökonomie [Environmental Economics]</p> <ul style="list-style-type: none"> Independent work on a topic in the field of environmental economics Learning techniques used in scientific work 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Umweltökonomie (L)	2	30	120	180
	Umweltökonomie (S)	2	30		
Assessment components	Examination and/or graded coursework: Coursework essay (25 pages) on an environmental economics topic explored in the seminar				
	Ungraded coursework: -				

Regular examination date	3rd semester
Offered	Annually, summer semester and winter semester
Duration	2 semesters
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	Conservation economics, fundamentals of economics
Module can be selected for	M.Sc. LENC

Elective module E1.2: Landnutzung II [Land Use II]	
Person responsible	Head of the General Economics and Landscape Economics working group
Language	German
Qualification objectives	Students acquire in-depth knowledge of different forms of land use, including their ecological characterisation, the potential for conflicts and the scope for compromise in relation to conservation efforts. Students become able to conduct appropriate analyses of land-use situations and compare them to alternatives. In addition, students will become experts in the conflict between land-use and conservation-related interests.
Module contents	<p>Lecture: Grünlandnutzung² [Grassland Use]</p> <ul style="list-style-type: none"> • Overview of the vegetational and floristic, conservation-related and agricultural aspects of grassland use in Central Europe • Trade-offs between yields and ecological services • Potential for conflicts and scope for compromise between agricultural and conservation efforts • Business-related framework conditions and competitiveness <p>Lecture: Ackerbau² [Arable Farming]</p> <ul style="list-style-type: none"> • Introduction to agrarian ecosystems • Accompanying flora in agrarian ecosystems and their importance for bioindication • Floristic classification of agrarian ecosystems • Competitive position of key production processes • System of transfer services within the EU and Germany <p>Lecture: Waldbau² [Forestry]</p> <ul style="list-style-type: none"> • Introduction to current methods in forest management • Forest management types, aspects of forest growth, forest site investigation • Conservation-related requirements of near-natural forest management • Practical exercise on forest inventory and forestry in existing stands <p>Lecture: Tierhaltung² [Animal Husbandry]</p> <ul style="list-style-type: none"> • Introduction to animal husbandry, covering cattle, horses, swine, sheep, bees and agricultural pasture feeding

	<ul style="list-style-type: none"> • Overview of specific veterinary aspects, domestication, historic development, economic and commercial significance, rearing and exploitation methods <p>Lecture: Nutzpflanzen der Erde [Terrestrial Crops]</p> <ul style="list-style-type: none"> • Overview of utilisable terrestrial plants, taking account of their biology, use, cultivation and distribution • Types of crops, their origins and domestication, general conditions for cultivation • Food crops: plants that provide carbohydrates; plants that provide protein; plants that provide oils and fats; plants that provide fruit; plants that provide vegetables and salad leaves; plants that provide substances used in alcohol and tobacco products; plants that provide spices • Plants with technical uses: Plants that provide fibres, rubber, resin, wax, corn, tannin and colourants 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Grünlandnutzung (L, SuSe, EY+, CE)	2	30	120	180
	Ackerbau (L, SuSe, OY+, CE)	2	30		
	Tierhaltung (L, WiSe, OY+, CE)	2	30		
	Nutzpflanzen der Erde (L, SuSe, CE)	2	30		
	Waldbau (L, SuSe, EY+, CE)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (30 minutes) or presentation (15 minutes) or coursework essay (15 pages) or poster presentation on the content of one of the two selected lectures				
	Ungraded coursework: Written examination* (30 minutes) or presentation* (15 minutes) or coursework essay* (15 pages) or poster presentation* on the content of one of the two selected lectures				
Regular examination date	3rd semester				
Offered	Every other year, winter/summer semester				
Duration	2 semesters				
Admission requirements	Students may only take lectures that they have not already completed in the Landnutzung I [Land Use I] module of the B.Sc. Landscape Ecology and Nature Conservation degree course.				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

+Please note: Some classes in this module are offered every academic year, while others are only offered in alternating years. Classes offered only in even-numbered years are marked "EY"; classes offered only in odd-numbered years are marked "OY". Classes marked with neither "EY" or "OY" are offered every academic year.

Elective module E1.3: Cost-Benefit Analysis					
Person responsible	Head of the General Economics and Landscape Economics working group				
Language	English				
Qualification objectives	Students expand their knowledge of microeconomics and its application in relation to the economic valuation of natural and landscape resources as well as for the valuation of all kinds of landscape interventions. They become confident in the application of cost-benefit analyses to various kinds of problems.				
Module contents	<p>Lecture: Cost-Benefit Analysis</p> <ul style="list-style-type: none"> • Introduction to the theoretical fundamentals of cost-benefit analysis and its practical applications • Microeconomic fundamentals of welfare economics (consumer surplus and producer surplus; compensating variation and equivalent variation; willingness to pay and willingness to accept) • Valuation of services and costs in primary and secondary markets, total economic value of natural resources • Discounting of future services and costs, private and social discounting rates • Uncertainty, expected value, information and quasi-option value • Valuation methods (demonstration projects, direct market value, indirect market value, production value, contingent valuation, choice experiments) • Transfer of value (benefits) and shadow prices • Steps involved in cost-benefit analyses and case studies • Alternative valuation methods (cost-effectiveness analysis, multi-criteria analysis) <p>Practical: Cost-Benefit Analysis</p> <ul style="list-style-type: none"> • Practical application of cost-benefit analyses to selected problems • Example calculations • Use of spreadsheets • Use of statistical methods 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Cost-Benefit Analysis (L)	2	30	120	180
	Cost-Benefit Analysis (Pra)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (90 minutes) on the lecture content				
	Ungraded coursework: -				

Regular examination date	2nd semester
Offered	Annually, in summer semester
Duration	1 semester
Admission requirements	None
Recommended previous knowledge	Conservation economics, environmental economics
Module can be selected for	M.Sc. LENC

Elective module E1.4: Economic Valuation of Natural Resources					
Person responsible	Head of the General Economics and Landscape Economics working group				
Language	English				
Qualification objectives	Students apply their economic knowledge from the 'Cost-Benefit Analysis' module by means of a literature analysis and an assessment project. They become able to engage critically with scientific literature and gain confidence in their presentation style and written expression. They learn to plan and confidently carry out research work related to economic valuation of natural resources.				
Module contents	<p>Seminar: Economic Valuation of Natural Resources</p> <ul style="list-style-type: none"> • Presentation and discussion of academic texts on the project topic • Preparation and work on the economic valuation project <p>Project</p> <ul style="list-style-type: none"> • Work on an academic research question as part of a practical valuation project, including write-up 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Valuation of Natural Resources (S)	2	30	120	180
	Project (P)	2	30		
Assessment components	Examination and/or graded coursework: Coursework essay (25 pages) on the project				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	Successful completion of the module 'Cost-Benefit Analysis'; limited number of spaces available, participation subject to approval from responsible module teacher				

Recommended previous knowledge	Conservation economics, environmental economics, cost-benefit analysis
Module can be selected for	M.Sc. LENC

Elective module E1.5: Peatland Utilisation	
Person responsible	Head of the Peatland Science working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> • In-depth knowledge of different forms of peatland use, their ecological consequences, potential for conflicts and scope for compromise • Ability to analyse and assess use situations and their alternatives • In-depth knowledge of the sustainability and “wise use” of peatlands • Expertise in the conflict between peatland use and conservation-related interests • In-depth knowledge of the impact of peatlands on the climate and of (voluntary) carbon markets (standards, criteria, MRV and economic aspects)
Module contents	<p>Lecture/Seminar: Peatland Utilisation</p> <ul style="list-style-type: none"> • Ecosystem services • Production functions: peat, drinking water, wild plants, wild animals • Supporting function: settings for hydroelectric power generation, water storage, fisheries, urban development, infrastructure and military training areas • Regulatory function in relation to the climate, hydrology, (waste)water purification and soil erosion • Information function in relation to identity and continuity, social contacts and work, leisure and relaxation, beauty, symbolism, evolutionary and ecological relationships, palaeoecological and actuoecological information, self-organisation and self-regulation • Transformational and optional function: education • “Wise use” of peatlands: fundamentals, analysis of conflicts, limitations, and guidelines <p>Seminar: Carbon Credits from Peatland Rewetting</p> <ul style="list-style-type: none"> • Commodification of ecosystem services • Peatlands, the climate and impact on greenhouse gases • UNFCCC, the Kyoto Protocol, REDD+ and the Paris Agreement • IPCC, IPCC Guidelines, IPCC guidance and IPCC reporting

	<ul style="list-style-type: none"> Standards, criteria and certificates Practical examples Carbon and co-benefits: MoorFutures 2.0 Economic aspects of carbon credits Ethics and offset 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Peatland Use (L)	2	30	120	180
	Carbon Credits from Peatland Rewetting (S)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (Peatland Use, 60 minutes)				
	Ungraded coursework: Attendance certificate* (Carbon Credits from Peatland Rewetting)				
Regular examination date	3rd semester				
Offered	Every other year; S as a block course during the lecture-free period in the summer semester, L in the following winter semester				
Duration	2 semesters				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E1.6: Wissenschaftstheoretische und ethische Aspekte des Naturschutzes [Aspects of the Philosophy of Science and Ethics in Conservation]	
Person responsible	Head of the Environmental Ethics working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> In-depth understanding of scientific methodological procedures and their limitations Ability to distinguish scientific statements from pseudoscientific statements and statements based purely on vested interests Knowledge of the key ecological concepts for conservation and criticisms of these concepts within the scientific community Ability to analyse conflicting objectives in conservation with regard to (often hidden) normative premises and map out generally comprehensible solution pathways

	by drawing on concepts from the field of environmental ethics				
Module contents	<p>Lecture: Theorie und Geschichte der Ökologie [Theory and History of Ecology]</p> <ul style="list-style-type: none"> • Ecology in public discourse • Criteria and methods of scientific rationality • General limitations of science and specific limitations of ecology • Historical review • Problems of distinction and scaling based on the terms “succession” and “climax” • Concepts of communities and stability • The diversity-stability debate in ecology and conservation • Biodiversity and ecosystem function • Holistic vs individualistic approaches in ecology • Ecological equilibrium or chaos? A paradigm shift in ecology <p>Seminar: Zielkonflikte im Naturschutz [Conflicting Objectives in Conservation]</p> <ul style="list-style-type: none"> • Different ethical concepts and the is-ought problem • The evolving concept of national parks • How artificial can conservation be? • Case studies on conflicting objectives between animal protection, species conservation, biotope conservation, process conservation and climate protection • The problem of invasive species • Renaturing and repatriation of locally extinct species • Arguments for and against population management • “Sustainable exploitation” of large mammals? • The debate around zoological collections • Conflicts between wind power and food production • Conflict between conservation and experiencing nature 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Theorie und Geschichte der Ökologie (L)	2	30	120	180
	Zielkonflikte im Naturschutz (S)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (90 minutes) on the ecology lecture or a coursework essay (15 pages) on the conflicting objectives seminar				
	Ungraded coursework: Presentation* as part of the seminar				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	None				

Recommended previous knowledge	Fundamental knowledge of environmental ethics
Module can be selected for	M.Sc. LENC

Elective module E1.7: Umweltethische Konzepte und ihre Umsetzung [Concepts of Environmental Ethics and their Implementation]					
Person responsible	Head of the Environmental Ethics working group				
Language	German				
Qualification objectives	<ul style="list-style-type: none"> • In-depth engagement with a specific ethical concept (e.g. Albert Schweitzer's ethic of reverence for life, Paul Taylor's ethic of respect for nature, etc.) or a specific ethical topic area (e.g. climate ethics, wilderness ethics, etc.) • Ability to critically analyse positions and topic areas in the field of environmental ethics • Insight into the psychological, philosophical, economic and sociopolitical requirements of putting environmental ethics concepts into practice • Knowledge of key approaches in environmental and conservation-related teaching, the opportunities they offer and their limitations 				
Module contents	<p>Seminar: Vom Umweltwissen zum Umwelthandeln [From Environmental Knowledge to Environmental Action]</p> <ul style="list-style-type: none"> • The relationship between environmental ethics and environmental education • Empirical evidence of the ecological crisis and environmental awareness • Environmental psychological insights into the gulf between knowledge and action • The environmental education concept of experiencing nature • Education for sustainable development • Environmental education and new media • Economic and political dimensions • Critiques of wants and needs, and the issue of "the good life" <p>Seminar II (title published in the relevant semester)</p> <ul style="list-style-type: none"> • Selected ethical concept or topic area <p>Content determined by the selected topic</p>				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Vom Umweltwissen zum Umwelthandeln (S)	2	30	120	180
	Seminar II: Selected ethical	2	30		

	concept or topic area (S)				
Assessment components	Examination and/or graded coursework: A coursework essay (15 pages) on one of the two seminars				
	Ungraded coursework: one presentation* (20 minutes) in each of the two seminars				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E2.1: Botanical Species Conservation					
Person responsible	Head of the General Botany and Plant Systematics working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of the laws of population biology in vascular plants ▪ Knowledge of important tools and legal regulations in the area of species protection ▪ Interpretation and fundamentals of creating red lists ▪ Strategies to prioritise species protection projects ▪ Processes to determine the biological basics of species protection programmes ▪ Managing and creating simple models on population biology ▪ Practical knowledge for collecting data on the population biology and demographics of plant populations 				
Module contents	<ul style="list-style-type: none"> • Fundamentals of population biology • Changes to flora and extinction of species in Germany and other regions of the world • Causes of threats to flora in Central Europe • German and IUCN red lists: structure, categories and systems of criteria • Priority-setting procedures in species conservation • Collecting data on how plants live, their distribution and reproductive systems for species protection programmes • Academic work on species protection and species protection programmes • Models in population biology (population and individual-based models, demographic matrices and SDMs) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload

	Seminar: Botanical Species Conservation	2			
	Practical: Investigation of Autecological Data in Plants	2		120	180
Assessment components	Examination and/or graded coursework: Practical exercises (20 pages) on the set exercise				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Summer semester				
Duration	One semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E2.2: Conservation Genetics of Plants	
Person responsible	Head of the General Botany and Plant Systematics working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of population genetics and its application to higher and lower plants ▪ Application of molecular biology methods in the laboratory to answer questions in the field of population genetics ▪ Basic understanding of the application of molecular methods for genotyping and population genetics, interpretation of results (AFLP, SSR, GBS, MIG-seq) ▪ Knowledge of the evolution and distribution of various reproductive systems in plants ▪ Evolution of sexual and asexual reproduction in higher plants ▪ Knowledge of the role of reproductive systems in speciation ▪ Experimental approaches for determining the reproductive system and sex distribution in higher plants
Module contents	<ul style="list-style-type: none"> • Fundamentals of population genetics and speciation in plants, taking account of inbreeding, apomixis, hybridisation and polyploidisation, and their influence on the evolution of reproductive systems • Evolution of sexual reproduction, advantages and disadvantages compared with asexual reproduction

	<ul style="list-style-type: none"> • Mating types and sexes in plants, generation change • Evolution of monoecy and dioecy, sex ratios in plants and reasons for unequal ratios • Gynodioecy and cytoplasmic male sterility • Laboratory practical to apply molecular biology methods (DNA extraction, sequencing or fingerprint method) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Seminar: Plant Reproduction Genetics	2	30	120	180
	Practical lab: Molecular Methods in Plant Conservation Genetics	2	30		
Assessment components	Examination and/or graded coursework: Report on the practical lab, 10 pages Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Summer semester				
Duration	One semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher; parallel registration for the Botanical Species Conservation module recommended				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E2.3: Experimental Plant Ecology 1	
Person responsible	Head of the Experimental Plant Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge of plant ecology and current research questions ▪ Development of experimental designs and their statistical evaluation
Module contents	<ul style="list-style-type: none"> • Experimental designs, such as block designs, split-plot designs, coordinated distributed experiments and gradient experiments • Variance analysis and regression analysis in linear and mixed models in R • Structured literature research

	<ul style="list-style-type: none"> Knowledge gaps and current research in plant ecology Development and presentation of overviews of the current state of knowledge for specific research questions in plant ecology 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Experimental Design & Analysis (L)	2	30	120	180
	Frontiers in Plant Ecology (S)	2	30		
Assessment components	Examination and/or graded coursework: Presentation (20 minutes) in the seminar				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Basic knowledge of statistics, R and plant ecology				
Module can be selected for	M.Sc. LENC				

Elective module E2.4: Experimental Plant Ecology 2					
Person responsible	Head of the Experimental Plant Ecology working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> Development and analysis of controlled ecological experiments Scientific writing 				
Module contents	<ul style="list-style-type: none"> Developing, maintaining and analysing experiments Evaluating and interpreting experimental data Scientific writing (including the introduction, methods, findings, discussion, conclusions and reference list) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Ecological Experiments (in groups) (Pra)	3	45	105	180
	Ecological Experiments (S)	2	30		
Assessment components	Examination and/or graded coursework: Scientific report (10 pages)				
	Ungraded coursework:				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				

Duration	1 semester
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	Basic knowledge of statistics, R and plant ecology
Module can be selected for	M.Sc. LENC

Elective module E2.5: Ornithology 1					
Person responsible	Head of the Bird Observatory				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge about ornithology as a scientific discipline through the understanding of avian characteristics, their ecology and evolution ▪ Introduction to current methods in Ornithology ▪ Understanding the role of birds in different habitats and their relation to humans 				
Module contents	<p>Lecture: Ornithology</p> <ul style="list-style-type: none"> ▪ Introduction to Ornithology, history, definitions and main concepts ▪ Origin and evolution of birds, evolution of flight ▪ Special anatomical and physiological adaptations ▪ Reproduction, growth and development ▪ Breeding behaviour and mating systems ▪ Social systems and territoriality ▪ Foraging, adaptation to different habitat types ▪ Sexual selection, feathers and colours ▪ Further ways to communicate and explore the environment vocalisation ▪ Circadian and circannual cycles ▪ Migration and navigation ▪ Systematic and phylogeny, current hypothesis and methods ▪ Diversity and biogeography, humans and birds ▪ Management and conservation, case studies <p>Seminar: Ornithology</p> <ul style="list-style-type: none"> ▪ Individual preparation and presentation of selected topics in ornithology 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Ornithology	2	30	120	180
	Seminar: Ornithology	2	30		
Assessment components	Examination and/or graded coursework: Written examination (60 min) on the lecture content				
	Ungraded coursework: Presentation* (20 min) on the seminar content				
Regular examination date	2nd semester				

Offered	Annually, summer semester
Duration	1 semester
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC, M.Sc. BEE

Elective module E2.6: Ornithology 2					
Person responsible	Head of the Bird Observatory				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Identification of local bird species in the collection and the field ▪ Proficiency in current methods in ornithology ▪ Understanding of the role of birds in different habitats and their relation to humans 				
Module contents	<p>Practical: In-depth Ornithological Methods</p> <ul style="list-style-type: none"> ▪ Introduction to field ornithology ▪ Presentation of methods for the study of birds on field sites. For example: identification of birds based on skin and feathers and in the field, observations, bird counts, mapping, morphological measurements, use of sonograms, telemetry, habitat characterisation 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical: In-depth Ornithological Methods	4	60	120	180
Assessment components	Examination and/or graded coursework: Report (10 pages) on the practical				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted following approval from responsible module teacher; registration only permitted simultaneously with or following completion of the Ornithology 1 module				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.7: Theoretical Ecology	
Person responsible	Head of the Animal Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of important theoretical concepts in ecology and key modelling approaches

	<ul style="list-style-type: none"> Understanding of simple mathematical ecological models and the ability to interpret and create them Application of numerical analysis of differential equation models 				
Module contents	<ul style="list-style-type: none"> Introduction to theoretical ecology Simple models of population dynamics Stability and deterministic chaos Traditional competition models and predator-prey systems Trophic cascades and food webs, resource-based models Multiple stressors and multiple resource limitation Numerical analysis of differential equations using modelling software (e.g. R) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture/Practical: Theoretical Ecology – combined lectures and practical exercises	4	60	120	180
Assessment components	Examination and/or graded coursework: Written examination (60 min) or oral examination (30 min) on the lecture content				
Regular examination date	Ungraded coursework: - 3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.8: Functional Animal Ecology 1	
Person responsible	Head of the Animal Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> Overview of important ecological concepts and approaches in functional animal ecology Critical reflection and presentation of pioneering and current scientific articles relevant to functional animal ecology
Module contents	<ul style="list-style-type: none"> Biodiversity Multiple resources and competition Experimental designs and statistical methods Trophic transfer and trophic cascades Ecological stoichiometry Aspects of feed quality

	<ul style="list-style-type: none"> ▪ Multiple stressors ▪ Chemical ecology and inducible defence 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Functional Animal Ecology	2	30	120	180
	Seminar: Functional Animal Ecology	2	30		
Assessment components	Examination and/or graded coursework: Written examination (60 min) or presentation (20 min) on the lecture and seminar content				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.9: Functional Animal Ecology 2					
Person responsible	Head of the Animal Ecology working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Ability to plan and carry out experiments to test scientific hypotheses and ecological concepts ▪ Knowledge of data collection, statistical analysis, representation, interpretation and presentation of scientific findings ▪ Critical reflection on own findings 				
Module contents	<ul style="list-style-type: none"> ▪ Planning and implementation of field recordings or experimental laboratory studies to determine diversity and functioning of e.g. aquatic biocoenoses ▪ Analysis and presentation of data collected in the form of a scientific article 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical: Functional Animal Ecology	4	60	120	180
Assessment components	Examination and/or graded coursework: Scientific report (10 pages) or poster presentation (15 min) on the practical				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted following approval from responsible module				

	teacher; registration only permitted simultaneously with or following completion of the Functional Animal Ecology 1 module
Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC, M.Sc. BEE

Elective module E2.10: Vegetation Ecology 1					
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> Ability to quantitatively and qualitatively analyse links between vegetation and the environmental parameters that influence them and interpret these with the assistance of autecological and synecological knowledge. 				
Module contents	<p>Practical: Quantitative Methods in Community Ecology</p> <ul style="list-style-type: none"> Basic knowledge of the R statistical computing environment Data types, scale levels, transformations and standardisation Correlation and regression techniques, distance measures Multivariate ordination and classification techniques <p>Seminar: Vegetation Ecology</p> <ul style="list-style-type: none"> Introduction and discussion of current hypotheses, theories and concepts in plant and vegetation ecology 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical: Quantitative Methods in Community Ecology	3	45	105	180
	Seminar: Vegetation Ecology	2	30		
Regular examination date	3rd semester				
Assessment components	Examination and/or graded coursework: Practical exercises (20 pages) on the practical				
	Ungraded coursework: Presentation* (20 min) on the seminar content				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.11: Vegetation Ecology 2					
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ In-depth understanding of the basic components of landscape ecology (climate, topography, soil, water, vegetation, humans) in the Central European landscape across space and time using a case study ▪ Practical knowledge of data collection in the field and preparation of scientific data ▪ Knowledge and practical skills for quantitative analysis of plant communities 				
Module contents	<ul style="list-style-type: none"> ▪ Exploration of an issue in vegetation ecology by means of a case study ▪ Gradient analysis in vegetation ecology ▪ Laboratory analysis of biomass and location parameters ▪ Data preparation and quantitative statistical data analysis 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical lab: Vegetation ecology case study	5	75	105	180
Assessment components	Examination and/or graded coursework: Scientific report (10 pages)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.12: Conservation and Behaviour 1	
Person responsible	Head of the Applied Zoology and Nature Conservation working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> • Knowledge of interdisciplinary approaches in conservation • Understanding that applied conservation and fundamental research are not contradictory but instead complement one another • Critical discussion of controversial questions from modern, interdisciplinary conservation biology • Reading, understanding, presenting and discussing primary literature written in English

Module contents	<p>Lecture: Conservation and Behaviour Fundamental concepts of behavioural biology and their application in conservation, including:</p> <ul style="list-style-type: none"> • Searching for food, avoiding predators and conservation • Habitat selection, migration and conservation • Sexual selection, partner selection and conservation • Mating systems and conservation • Caring for the brood, parental investment and conservation • Group life and conservation • Cooperation and conservation • Individual differences and conservation • Human behaviour and conservation <p>Seminar: Frontiers in Conservation (compulsory elective)</p> <ul style="list-style-type: none"> • Presentation and discussion of current, controversial scientific work from the field of conservation biology. Further exploration of topics discussed in the lecture. <p>Seminar: Conservation Behaviour (compulsory elective)</p> <ul style="list-style-type: none"> • Introduction to and discussion of current and classic scientific work from the intersection of behavioural and conservation biology. • Further exploration of topics discussed in the lecture. 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Conservation and Behaviour	2	30	120	180
	Seminar: Frontiers in Conservation or Conservation Behaviour	2	30		
Regular examination date	2nd semester				
Assessment components	Examination and/or graded coursework: Written examination (60 min) on the lecture content				
	Ungraded coursework: Presentation* (20 min) on the content of the selected seminar				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.13: Conservation and Behaviour 2					
Person responsible	Head of the Applied Zoology and Nature Conservation working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> Practical application of the theoretical knowledge obtained in the module Conservation and Behaviour 1 Initial experience with scientific work, in particular at the cross-section of conservation and behavioural biology 				
Module contents	Practical: Behavioural Methods in Conservation <ul style="list-style-type: none"> Scientific data collection in the field or in the laboratory Work on conservation topics related to behavioural biology, e.g. working with bats, social insects, host-parasite interactions and other native animal species. This work is typically conducted in the field. 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical: Behavioural Methods in Conservation	4	60	120	180
Assessment components	Examination and/or graded coursework: Report (10 pages) or poster presentation (15 min)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted following approval from responsible module teacher; registration only permitted simultaneously with or following completion of the module Conservation and Behaviour 1				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.14: Conservation Genetics 1	
Person responsible	Head of the Applied Zoology and Nature Conservation working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> Familiarisation with the importance of genetics for conservation and wild animal management Understanding of the potential and problems of genetic methods and the conditions under which their use can be particularly informative Critical engagement with modern, interdisciplinary conservation genetics Reading, understanding, presenting and discussing primary literature written in English
Module contents	Lecture: Conservation and Landscape Genetics <ul style="list-style-type: none"> Importance of genetics for conservation and wild animal management

	<ul style="list-style-type: none"> • Advantages and disadvantages of various methods in population genetics • Genetics and extinction • Genetic diversity: definitions and detection methods • Concepts in population genetics • Evolutionary genetics of natural populations • Genetic consequences of small population sizes • Maintenance of genetic diversity • Inbreeding, demography and extinction • Non-invasive genotyping • Population fragmentation: Importance for conservation FST; assignment methods • Detection of dispersion with genetic methods • Landscape genetics, dispersion and diseases • Invasive species • Fundamentals of phylogenetics <p>Seminar: Evolutionary Conservation Biology (CE)</p> <ul style="list-style-type: none"> • Presentation and discussion of current and classic scientific works from the intersection of evolutionary and conservation biology. Further exploration of topics discussed in the lecture. <p>Seminar: Current Topics in Conservation (CE)</p> <ul style="list-style-type: none"> • Presentation and discussion of current, controversial scientific work from the field of conservation biology. The objective is to discuss and debate current and controversial scientific topics. 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Conservation and Landscape Genetics	2	30	120	180
	Seminar: Current topics in Conservation or Evolutionary Conservation Biology	2	30		
Assessment components	Examination and/or graded coursework: Written examination (60 min) on the lecture content				
	Ungraded coursework: Presentation* (20 min) on the content of the selected seminar				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				

Module can be selected for	M.Sc. LENC, M.Sc. BEE
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Elective module E2.15: Conservation Genetics 2					
Person responsible	Head of the Applied Zoology and Nature Conservation working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> • Practical application of the theoretical knowledge obtained in the module Conservation Genetics 1 • Further exploration of the practical applications of population genetics in conservation using examples • Laboratory evaluation of genetic data to answer questions in the field of conservation biology 				
Module contents	Practical: Methods in Conservation and Landscape Genetics <ul style="list-style-type: none"> • Application of modern analytical methods of conservation and landscape genetics, including: • Population fragmentation: FST und assignment methods • Detection of dispersion with genetic methods • Landscape genetics, dispersion and diseases • Phylogeography based on molecular markers 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical: Methods in Conservation and Landscape Genetics	4	60	120	180
Assessment components	Examination and/or graded coursework: Report (10 pages)				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted following approval from responsible module teacher; registration only permitted simultaneously with or following completion of the module Conservation Genetics 1				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.16: Aquatic and Marine Microbiology 1	
Person responsible	Head of the Microbial Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge and application of theoretical and methodological fundamentals of aquatic and marine microbiology ▪ Understanding of microbial life in the marine environment ▪ Knowledge of recent research projects on microbial communities in marine habitats ▪ Ability to present and critically discuss relevant topics in marine microbiology
Module contents	<p>Lecture: Microbiology of Marine Habitats</p> <ul style="list-style-type: none"> ▪ General introduction to marine microbiology ▪ Characteristic features of pelagic and benthic environments in the ocean (characteristics of seawater, the seafloor and its sediments) ▪ The ocean as a microbial habitat: abundance, distribution and diversity of marine microbes (viruses, bacteria, archaea, fungi and microalgae) ▪ Structure and function of microbial communities in selected pelagic and benthic environments <p>Seminar: Microbiology of Marine Habitats</p> <ul style="list-style-type: none"> ▪ Recent scientific literature and projects about research on microbial communities in marine habitats ▪ Oral presentation and discussion of reviews and original papers <p>Lecture: Methods of Aquatic Environmental Microbiology</p> <ul style="list-style-type: none"> ▪ Methods in marine microbiology (sampling, experimental approaches, methods for physico-chemical characterisation of the environment, sediment characterisation, methods for isolation, cultivation and identification of microbes, microscopic and molecular methods for microbial abundance, diversity and activity) <p>Practical: Methods of Aquatic Environmental Microbiology</p> <ul style="list-style-type: none"> ▪ Introduction to epifluorescence microscopy ▪ Fixation and staining of environmental samples and microbial cultures ▪ Visualisation and documentation of fluorescence-labelled prokaryotes and eukaryotes ▪ Discussion of advantages/disadvantages of diverse staining techniques

Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Microbiology of Marine Habitats	1	15	90	180
	Lecture: Methods of Aquatic Environmental Microbiology	1	15		
	Seminar: Microbiology of Marine Habitats	2	30		
	Practical: Methods of Aquatic Environmental Microbiology	2	30		
Assessment components	Examination and/or graded coursework: Written examination (45 min) on the lectures' content				
	Ungraded coursework: Presentation* (20 min) on the seminar content, report* (2 pages) on the practical				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.17: Aquatic and Marine Microbiology 2	
Person responsible	Head of the Microbial Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge and application of theoretical fundamentals of aquatic and marine microbiology ▪ Understanding of microbial life in marine extreme environments ▪ Knowledge of traditional and modern molecular methods/technologies to analyse microbial communities in aquatic and marine habitats ▪ Ability to present and critically discuss methodological approaches applied in aquatic and marine microbial ecology
Module contents	<p>Lecture: Microbiology of Marine Extreme Habitats</p> <ul style="list-style-type: none"> • Extremophilic microorganisms and their habitats (e.g. hypersaline environments, cryosphere: sea-ice, glaciers, subglacial lakes; oligotrophic environments:

	<p>deep biosphere, deep-sea, hydrothermal vents, cold vents)</p> <ul style="list-style-type: none"> • Microbial response/adaptation to extreme environmental conditions (e.g. starvation-survival strategies, invertebrate-bacteria symbiosis) <ul style="list-style-type: none"> ▪ Biotechnological utilisation of extremophiles <p>Lecture: Ecology of the Baltic Sea</p> <ul style="list-style-type: none"> ▪ Baltic Sea research and research institutes ▪ Development of the Baltic Sea ▪ Bottom topography, sediments ▪ Oceanography of the Baltic Sea (water exchange, stratification, saltwater inflows) ▪ Monitoring of the Baltic Sea (HELCOM recommendations) ▪ Classification and ecological relevance of plankton communities (bacterioplankton, phytoplankton, zooplankton) ▪ Seasonal and local variations of phytoplankton blooms: <ul style="list-style-type: none"> ▪ Cyanobacterial blooms, harmful algae blooms (HABs) ▪ Low oxygen levels (hypoxia) and laminated sediments ▪ Ecologically relevant processes of zooplankton (ingestion, vertical migration) ▪ Long-term changes of plankton communities ▪ Role of benthic communities in the nutrient cycles ▪ Biological invasion ▪ Eutrophication of coastal waters (Bodden) ▪ Anthropogenic impact on the Baltic Sea <p>Seminar: The Oceans: Pollution, Risks and Changes</p> <ul style="list-style-type: none"> ▪ Recent scientific literature on the influence of marine pollution and climate change on the structure and function of microbial symbioses (e.g. nutrient and pollutant concentration, ocean acidification, ozone pollution, melting of the Arctic sea ice) ▪ Study and oral presentation of reviews and original papers written in English ▪ Supplement to the practical lab course 'Methods of Molecular Microbial Ecology' in the module 'Aquatic and Marine Microbiology 3' 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Microbiology of Marine Extreme Habitats	1	15	120	180

The English translation of *Anhang B: Modulkatalog für den Masterstudiengang "Landscape Ecology and Nature Conservation"* is intended solely as a convenience to non-German-reading students/members of the University. Only the German text published on the University of Greifswald's website on 16 October 2023 is legally binding. In the event of any conflict between the English and German text, its structure, meaning or interpretation, the German text, its structure, meaning or interpretation shall prevail.

	Lecture: Ecology of the Baltic Sea	1	15		
	Seminar: The Oceans: Pollution, Risks and Changes	2	30		
Assessment components	Examination and/or graded coursework: Written examination (45 min) on the lectures' content				
	Ungraded coursework: Presentation* (20 min) on the seminar content				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	Participation in the modules Aquatic and Marine Microbiology 1 & 3 is also recommended				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.18: Aquatic and Marine Microbiology 3	
Person responsible	Head of the Microbial Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of molecular methods applied to characterise microbial communities in aquatic and marine habitats ▪ Essential laboratory skills in microbiology ▪ Data analysis, including statistical approaches ▪ Learning how to visualise data scientifically ▪ Ability to present, interpret and critically discuss experimental data
Module contents	<p>Practical lab: Methods of Molecular Microbial Ecology</p> <ul style="list-style-type: none"> ▪ Sampling techniques for planktonic and benthic microorganisms at different sites of coastal waters ▪ Measurement of relevant environmental parameters ▪ Molecular methods to analyse pelagic and benthic microbial communities (DNA extraction, PCR analyses, gel documentation) ▪ Analyses of microbial numbers and biomass ▪ Identification and diversity of microorganisms ▪ Fluorescence <i>in-situ</i> hybridisation technologies ▪ Fingerprinting techniques to analyse the physiological profile of the microbial communities ▪ Characterisation of the enzymatic degradation potential and spectrum of degrading enzymes of heterotrophic prokaryotes ▪ Enzymatic analyses (substrate saturation and temperature optimum of different hydrolytic enzymes)

Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical lab: Methods of Molecular Microbial Ecology	5	75	105	180
Assessment components	Examination and/or graded coursework: Presentation (15 min) on the practical lab				
	Ungraded coursework: Group report* (5 pages/person) on the practical lab				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Participation in Aquatic and Marine Microbiology 1 is also recommended				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.19: Microbial Ecology 1: Microbial Processes, Energy Fluxes and Elemental Cycles	
Person responsible	Head of the Microbial Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of the evolution of microbial life ▪ Knowledge of microbial processes and key elemental cycles ▪ Learning basic principles of microbial energy yields ▪ Insights in the diversity of microbial-mediated biogeochemical processes ▪ Role of microbes in elemental cycles ▪ Fundamentals of microbial ecology and general microbiology
Module contents	<p>Lecture: Microbial Processes, Energy Fluxes and Elemental Cycles</p> <ul style="list-style-type: none"> ▪ Origins of life, evolution of microbial life ▪ Microbial processes, energy yields and energy transfer ▪ Microbial primary production and phototrophy ▪ Microbial respiration and fermentation in anoxic environments (supply and concentration of various electron acceptors) ▪ Microbial growth and biomass production ▪ Chemolithotrophy ▪ Methanogenesis and methanotrophy ▪ Microbial interactions in the carbon, nitrogen, sulphur, phosphorus, iron and manganese cycles ▪ Role of trace metals in microbial metabolism ▪ Microorganisms and their physiological properties/adaptations

	<ul style="list-style-type: none"> ▪ Microbial communities in selected environments ▪ Biogeochemical aspects (biomineralisation, weathering and mineral dissolution by microbes) ▪ Global aspects of microbial energy transfer and elemental cycles 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Microbial Ecology 1: Microbial Processes, Energy Fluxes and Elemental Cycles	4	60	120	180
Assessment components	Examination and/or graded coursework: Written examination (90 min) on the lecture content				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.20: Microbial Ecology 2: Microbial Biodiversity, Interactions and Molecular Ecology	
Person responsible	Head of the Microbial Ecology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge of microbial ecology, with an emphasis on microbial interactions ▪ Understanding of both classical and novel concepts describing microbial interactions (e.g. symbiosis, microbiome, holobionts) ▪ Application of central concepts of community ecology and biodiversity research in a microbial context ▪ Knowledge of traditional and modern methodology to investigate microbial diversity (e.g. cultivation-based approaches, microscopy, molecular marker molecules, metagenomics)
Module contents	<ul style="list-style-type: none"> ▪ The (microbial) tree of life, three domains and the unseen majority ▪ Microbial interactions, terminology ▪ Symbiosis, mutualism and commensalism ▪ Antagonism and pathogenicity ▪ Trophic interactions in microbial communities ▪ Competition and coexistence on microscopic scales

	<ul style="list-style-type: none"> ▪ Measuring microbial diversity (molecular methods, richness, evenness, diversity metrics) ▪ Elements of microbial biodiversity (α-diversity, β-diversity, γ-diversity) ▪ Microbial community ecology ▪ Microbial biogeography, is everything everywhere? ▪ The rare biosphere ▪ Microbe-environment interactions with examples ▪ Microbe-microbe interactions with examples ▪ Microbe-host interactions, holobionts and microbiomes with examples ▪ Cultivation-based microbial biodiversity assessment ▪ Microscopy-based methods to study microbial communities ▪ Classical molecular methods (DNA-DNA hybridisation, DGGE, tRFLP, clone libraries) ▪ Modern molecular methods (NGS-sequencing, SSU amplicon analysis, metagenomics and metagenome assembled genomes) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Microbial Interactions	2	30	120	180
	Lecture: Molecular Ecology of Microbes	2	30		
Assessment components	Examination and/or graded coursework: Written examination (60 min) on the lectures' content				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.21: Evolutionary Ecology 1	
Person responsible	Head of the General and Systematic Zoology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Conceptual insight into evolutionary ecology ▪ Critical reflection on current scientific research in the realm of behavioural ecology, functional morphology and reproductive strategies ▪ Special training in comparative morphological analyses

	<ul style="list-style-type: none"> Training in team work and group presentations (oral and/or poster) 				
Module contents	<ul style="list-style-type: none"> Lecture and seminar (combined): Introduction and discussion of concepts and showcases of evolutionary ecology Anatomy of Fitness practical: Investigation of morphological structures connected to reproductive strategies. 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture/Seminar: Evolutionary Ecology	2	30	120	180
Practical: Evolutionary Ecology: Anatomy of Fitness	2	30			
Assessment components	Examination and/or graded coursework: Written examination (60 min) or oral examination (30 min) on the lecture/seminar and practical				
	Ungraded coursework: Presentation* (15 min) on the seminar, plus a poster presentation*, or presentation* (15 min) on the practical				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Interest in evolutionary biology and behavioural strategies				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.22: Evolutionary Ecology 2					
Person responsible	Head of the General and Systematic Zoology working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> Advanced knowledge on concepts and research topics in evolutionary ecology Critical reflection on current scientific research in the realm of behavioural ecology, functional morphology and reproductive strategies Knowledge of data acquisition, analysis and interpretation (experimental design, basic statistics) Scientific writing skills 				
Module contents	<ul style="list-style-type: none"> Methods in behavioural research Projects on behavioural ecology or functional morphology in an evolutionary framework 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload

	Practical: Evolutionary Ecology: Analysis of Behaviour	2	30	105	180
	Practical: Evolutionary Ecology Project	3	45		
Assessment components	Examination and/or graded coursework: Presentation* (20 min) with written assignment* (10 pages) on the Evolutionary Ecology Project practical				
	Ungraded coursework: (Short) presentation* (10 min) with written assignment* (10 pages) on the Analysis of Behaviour practical				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted following approval from responsible module teacher; registration only permitted together with registration for the Evolutionary Ecology 1 module				
Recommended previous knowledge	Interest in evolutionary biology and behavioural strategies				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.23: Plant Stress Physiology					
Person responsible	Head of the Plant Physiology working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge in the area of plant stress physiology and the practical application of this knowledge in biotechnology ▪ Critical reflection on current scientific works in the area of plant stress physiology ▪ Leading group discussions 				
Module contents	<ul style="list-style-type: none"> ▪ Molecular and biochemical fundamentals of stress perception and stress adaptation in plants ▪ Effects of abiotic stress factors on plants • Applied research/biotechnology 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Basics of Plant Stress Physiology	1	15	120	180
	Lecture: Advanced Plant Stress Physiology	2	30		
	Seminar: Basics of	1	15		

	Plant Stress Physiology				
Assessment components	Examination and/or graded coursework: Written examination (60 min) or oral examination (30 min) on the lectures' content				
	Ungraded coursework: Exercises* (20 pages) on the seminar content				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.24: Experimental Plant Stress Physiology					
Person responsible	Head of the Plant Physiology working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ In-depth understanding of biochemical and molecular mechanisms that enable plants to react dynamically to environmental changes ▪ Practical knowledge in the analysis of molecular and biochemical stress parameters ▪ Preparation, depiction, discussion and presentation of scientific data 				
Module contents	<ul style="list-style-type: none"> ▪ Ability to test hypotheses scientifically ▪ Experimental design; conceptualisation, independent implementation and evaluation of scientific experiments on current topics of stress physiology in plants 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Seminar: Experimental Plant Stress Physiology	1	15	105	180
	Practical lab: Experimental Plant Stress Physiology	4	60		
Assessment components	Examination and/or graded coursework: Poster presentation (15 min) on the practical lab				
	Ungraded coursework: Presentation* (30 min) on the seminar content				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of participants, registration only permitted simultaneously with or following completion of the Plant Stress Physiology module				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.25: Forest Ecology					
Person responsible	Staff member from the Landscape Ecology and Ecosystem Dynamics working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge in the area of forest ecology ▪ Critical reflection on current scientific works in the area of forest ecology and forest management ▪ Ability to identify and understand interrelationships and ecological fundamentals in complex ecosystems ▪ Holistic understanding of the forest as an organism 				
Module contents	<ul style="list-style-type: none"> • Material flows in forest ecosystems • Stability and resilience in forest ecosystems • Succession and other dynamic processes • Interactions in forests: Adaptation, cooperation and competition • Ecosystem services in forests and their valorisation • Post-glacial forest development • Experiencing the forest – approaches to forests beyond science • Scientific work on forest ecology and ecological forest management 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Forest Ecology	2	30	120	180
	Seminar: Forest Ecology	2	30		
Assessment components	Examination and/or graded coursework: Seminar presentation (20 min)				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E2.26: Evolutionary Morphology	
Person responsible	Head of the Cytology and Evolutionary Biology working group / Head of the Zoological Museum
Language	English
Qualification objectives	<ul style="list-style-type: none"> • Acquisition of in-depth theoretical knowledge in the area of evolutionary morphology and functional morphology of invertebrates • In-depth introduction to the evolution of organ systems, in particular sensory organs, nervous systems and reproductive organs

	<ul style="list-style-type: none"> • Introduction to imaging methods • Introduction to the scientific testing of hypotheses; independent project conceptualisation and implementation 				
Module contents	<p>Lecture: Evolutionary Morphology</p> <ul style="list-style-type: none"> • Topics related to the fundamentals of evolutionary morphology • Semantic networks and descriptive morphology • Functional morphology of selected organ systems (including muscles, sensory organs, nervous system, reproductive system, circulatory system) and their phylogenetic relevance and evolution within invertebrates, in particular arthropods • Theoretical principles of imaging methods with a small practical component <p>Seminar: Evolutionary Morphology</p> <ul style="list-style-type: none"> • Independent examination and presentation of selected topics/research concepts on the evolution of invertebrates, in particular arthropods, from the areas of systematics and morphology 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Evolutionary Morphology	2	30	120	180
	Seminar: Evolutionary Morphology	2	30		
Assessment components	<p>Examination and/or graded coursework: Written examination (60 min) on the lecture content</p> <p>Ungraded coursework: Presentation* (20 min) on the seminar content</p>				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E2.27: Making the Invisible Visible: Introduction to Imaging Methods	
Person responsible	Head of the Cytology and Evolutionary Biology working group / Head of the Zoological Museum
Language	English
Qualification objectives	<ul style="list-style-type: none"> • Introduction to microscopic methods • In-depth theoretical and practical introduction to imaging methods • In-depth theoretical and practical introduction to processing and presenting 2D and 3D data

	<ul style="list-style-type: none"> • Introduction to the scientific testing of hypotheses; independent project conceptualisation and implementation 				
Module contents	<p>Lecture: From Object to Image: Imaging Methods in Evolutionary Morphology</p> <ul style="list-style-type: none"> ▪ Accompanying theoretical introduction to imaging methods <p>Practical: From Object to Image: Imaging Methods in Evolutionary Morphology</p> <ul style="list-style-type: none"> • Overview of morphological methods in evolutionary research (e.g. immunohistochemistry, electron microscopy, histology) • Practical introduction to structural analysis with various imaging methods (electron microscopic and fluorescence microscopic examinations, histochemical and immunohistochemical staining, confocal laser scanning microscopy, micro-computer tomography) • 3D reconstruction of selected organ systems, visualisation methods • Experimental design; conceptualisation of a scientific piece of writing; implementation of an independent project • Engagement with scientific literature and production of scientific work/charts 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: From Object to Image: Imaging Methods in Evolutionary Morphology	1	15	120	180
	Practical: From Object to Image: Imaging Methods in Evolutionary Morphology	3	45		
Assessment components	Examination and/or graded coursework: Report* (10 pages) on the practical				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E3.1: Climate Change	
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group

Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ Advanced knowledge of climate change and its consequences ▪ Critical reflection on current scientific works in the area of climate change research ▪ Ability to learn and work in groups (peer learning) Ability to lead group discussions and group presentations (talks or posters) 				
Module contents	<ul style="list-style-type: none"> • Scientific fundamentals of climate change research • The global climate system • The Earth's energy budget • The Earth's palaeoclimate • The global carbon cycle • Global circulation systems and teleconnections • Anthropogenic and natural climate change • Abrupt climate change • Scientific paper on climate change and its consequences 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture: Climate Change	2	30	120	180
	Seminar: Climate Change	2	30		
Assessment components	Examination and/or graded coursework: Poster presentation (15 min)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. BEE				

Elective module E3.2: Dendrochronology	
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Introduction to dendrochronology (tree ring research) ▪ Basic understanding of tree-ring-based reconstructions of climatic and environmental conditions ▪ Basic time-series analysis ▪ Ability to plan a scientific study that reconstructs environmental conditions using tree rings

Module contents	<ul style="list-style-type: none"> • Design of data collection in the field • Collecting samples from trees, bushes and fossilised wood • Sample processing (sanding, microsections) • Sample analysis (tree-ring width, latewood density) • Chronology-building and time-series analysis • Analysis of environmental impacts on tree rings • Reconstruction of environmental parameters • Use of international databases for tree-ring research 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical lab: Dendrochronology	5	60	120	180
Assessment components	Examination and/or graded coursework: Report* (10 pages)				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, summer semester/winter semester Block of 7 to 8 days				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. Earth Science				

Elective module E3.3: Environmental Hydrogeology	
Person responsible	Head of the Applied Geology and Hydrogeology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> • Knowledge of aspects of groundwater ecology and sustainable groundwater management • Ability to identify and assess groundwater contamination with regard to remediation techniques in the course of a risk assessment • Knowledge of groundwater management in industrial, newly industrialised and developing countries • Practical skills in numerical groundwater flow and transport modelling • Ability to engage with and communicate scientific topics in a structured manner • Teamwork skills
Module contents	<ul style="list-style-type: none"> • Regional hydrogeology with a focus on soil and groundwater contamination risks presented by natural and anthropogenic influences • Environmental aspects in urban and rural regions of industrial and newly industrialised countries • Sustainable groundwater management techniques • Types of groundwater contamination

The English translation of *Anhang B: Modulkatalog für den Masterstudiengang "Landscape Ecology and Nature Conservation"* is intended solely as a convenience to non-German-reading students/members of the University. Only the German text published on the University of Greifswald's website on 16 October 2023 is legally binding. In the event of any conflict between the English and German text, its structure, meaning or interpretation, the German text, its structure, meaning or interpretation shall prevail.

	<ul style="list-style-type: none"> Groundwater remediation techniques Numerical groundwater flow and material transport modelling 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Environmental Hydrogeology (L)	1	15	90	180
	Theory of Groundwater Flow Modelling (L)	1	15		
	Groundwater Flow Modelling (Pra)	4	60		
Assessment components	Examination and/or graded coursework: Portfolio (1 case study, seminar presentation (15–20 min), 4–6 exercises*)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Hydrogeology, hydrogeochemistry, sound mathematical and computer skills				
Module can be selected for	M.Sc. LENC				

Elective module E3.4: Facies Analysis of Glacial Deposits	
Person responsible	Head of the Quaternary Geology working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> Understanding of the facies concept and different approaches to facies analysis Ability to identify and differentiate between different glacial facies types (e.g. subglacial, terminoglacial, supraglacial) Knowledge/application of modern till classification and micromorphological terminology Ability to identify, analyse and genetically interpret micromorphological structures in glacial sediments
Module contents	<ul style="list-style-type: none"> Diagnostic criteria of glacial sediments Erosion, material uptake and material transport by glaciers Subglacial deposition processes and sedimentary products Till sedimentology and classification

	<ul style="list-style-type: none"> Analytical methods in micromorphology and microfacies analysis of glacial sediments (polarisation microscopy) Practical fieldwork (facies recording and interpretation) 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Facies Analysis of Glacial Sediments (L)	2	30	105	180
	Fieldwork (PL)	Several days	30		
	Micromorphology of Glacial Sediments (Pra)	1	15		
Assessment components	Examination and/or graded coursework: Presentation (15 min) with written summary (10 pages) on the Micromorphology of Glacial Sediments practical course				
	Ungraded coursework: Portfolio* comprising 2x reports on the practical lab fieldwork. Report 1 (5 pages): 2 detailed sketches. Report 2 (5 pages): a lithographic log, including a facies analysis				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	Fundamental knowledge of sedimentology, sedimentary deposition areas and glacial geology (lectures on sedimentology/Quaternary geology)				
Module can be selected for	M.Sc. LENC				

Elective module E3.5: Quartäre Geoarchive [Quaternary Geoarchives]	
Person responsible	Head of the Physical Geography working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> Advanced knowledge of the methods used in palaeoclimate research and climate development in the Quaternary Understanding of factors that influence the distribution, development and evolution of fauna and flora in the Quaternary Understanding of climate-driven morphodynamic processes in selected landscape systems Knowledge of the development of human-environment interaction in the late Pleistocene and Holocene

Module contents	<ul style="list-style-type: none"> • Depiction of the distribution and characteristics of different Quaternary geoarchives – e.g. lake sediments, loess, peatlands, tree ring chronologies, marine sediments, and glaciers • Explanations of typical proxies for examining and interpreting geoarchives • Fieldwork and laboratory methods for collecting proxies 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Klimawandel und Geoarchive (L)	2	30	120	180
	Excursion/Fieldwork (PL)	2	30		
Assessment components	Examination and/or graded coursework: Written examination (30 min) Ungraded coursework: Report* (10 pages)				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	None				
Recommended previous knowledge	Lecture: Geomorphology				
Module can be selected for	M.Sc. LENC				

Elective module E3.6: Paläontologie [Palaeontology]	
Person responsible	Head of the Palaeontology and Historical Geology working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> • Advanced knowledge of palaeobiological and palaeoecological fundamentals • Skills related to the systematic and taxonomic examination of invertebrate macrofossils • Ability to assess former deposition areas using macroinvertebrates • Rough age-based classification of sediments based on stratigraphically relevant macroinvertebrates • Knowledge of the methods used to interpret deposition areas
Module contents	<ul style="list-style-type: none"> • Taxonomy, palaeobiology and ecology of Phanerozoic macroinvertebrates • Stratigraphic distribution of Phanerozoic macroinvertebrates • Exercises on recording and evaluating the characteristics of fossilised hard parts of organisms' remains

Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Paläontologie der Invertebraten (S)	2	30	120	180
	Paläontologie der Invertebraten (Pra)	2	30		
Assessment components	Examination and/or graded coursework: Presentation (20 min)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	Basic knowledge of zoology				
Recommended previous knowledge	General palaeontology, introduction to palaeozoology, Earth history				
Module can be selected for	M.Sc. LENC				

Elective module E3.7: Paläoökologie und Evolution [Palaeoecology and Evolution]					
Person responsible	Head of the Palaeontology and Historical Geology working group				
Language	German				
Qualification objectives	<ul style="list-style-type: none"> ▪ Systematic and taxonomic examination of microfossils ▪ Skills in describing the characteristics of fossilised hard parts ▪ Ability to perform rough age-based classification of stratigraphically relevant microfossils ▪ Ability to perform ecological classification of microfossils ▪ Fundamental knowledge of the process of reconstructing extinction events ▪ Knowledge of the records and interpretation of different ecosystems 				
Module contents	<ul style="list-style-type: none"> • Classification of microfossils • Palaeobiology, ecology and stratigraphy of microfossils • Exercises on the morphological recording of taxonomically relevant characteristics • Mass extinction and evolution • Analysis of global mass extinction processes in Earth's history <p>Features, prevalence and transformation of different ecosystems</p>				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Mikropaläontologie für	2	30	105	180

	Fortgeschrittene (L)				
	Mikropaläontologie für Fortgeschrittene (Pra)	2	30		
	Massenaussterben i.d. Erdgeschichte (L) (CE)	1	15		
	Paläoökosysteme (L/Pra) (CE)	1	15		
Assessment components	Examination and/or graded coursework: Written examination (90 minutes) on the content of the classes Ungraded coursework:				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Recommended previous knowledge	General palaeontology, introduction to palaeozoology, Earth history				
Module can be selected for	M.Sc. LENC				

Elective module E3.8: Organismen in Raum und Zeit [Organisms in Space and Time]	
Person responsible	Teaching staff in the Palaeontology and Historical Geology working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> ▪ Understanding of the diversity of factors that influence the distribution, development and evolution of organisms, looking at the example of the (climatically exceptionally dynamic) Quaternary period and the Ice Age ▪ Understanding of the general fundamentals of evolution, evolutionary diversity in the spatial-temporal structure, looking at the example of vertebrates ▪ Ability to independently present a range of palaeontological topics ▪ Familiarisation with different microfossil groups ▪ Microscope skills
Module contents	<p>Quartärpaläontologie [Quaternary Palaeontology]</p> <ul style="list-style-type: none"> • The history of climate and landscape in the Ice Age and their impacts on flora and fauna • Climate-related territory dislocations, palaeogeography • Climate indicators <p>Wirbeltierpaläontologie [Vertebrate Palaeontology]</p> <ul style="list-style-type: none"> • Basic terminology used in evolution and taxonomy • Basic blueprints of the vertebrate skeleton • Evolution of vertebrates

	Einführung in die Mikropaläontologie [Introduction to Micropalaeontology]				
	<ul style="list-style-type: none"> General introduction to microfossils 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Quartärpaläontologie (L/Pra)	2	30	105	180
	Wirbeltierpaläontologie (L/Pra)	2	30		
	Einführung in die Mikropaläontologie (L/Pra)	1	15		
Assessment components	Examination and/or graded coursework: Written examination (90 minutes) on the content of the classes				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Recommended previous knowledge	General fundamental knowledge of palaeontology or zoology as well as geology.				
Module can be selected for	M.Sc. LENC				

Elective module E3.9: Restoration Ecology	
Person responsible	Head of the Peatland Science working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> Advanced knowledge in the area of (peatland) restoration ecology Critical reflection on (peatland) restoration practice In-depth knowledge of peatland degradation along with restoration opportunities and targets Ability to present and discuss issues in public
Module contents	<p>Seminar: Restoration Ecology</p> <ul style="list-style-type: none"> Literature research and evaluation on ecological restoration Preparation and presentation of a topic Discussion of the presentation format and contents <p>Lecture/Seminar: Peatland Restoration</p> <ul style="list-style-type: none"> Definition of restoration terminology History of peatland restoration Peatland degradation: history, processes and stages Ecosystem services and restoration targets Restoration for different purposes (i.e. conservation, climate protection or paludiculture) Planning, objective-setting and limitations Public participation and stakeholder involvement Financial aspects and subsidies

Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Restoration Ecology (S)	2	30	120	180
	Peatland Restoration (L/S)	2	30		
Assessment components	Examination and/or graded coursework: Presentation (Restoration Ecology, 20 minutes)				
	Ungraded coursework: Attendance certificate* (Peatland Restoration)				
Regular examination date	3rd semester				
Offered	Annually: S in the winter semester; L/S as a block course during the lecture-free period in the winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E3.10: Peatland Ecohydrology	
Person responsible	Head of the Peatland Science working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> Acquisition of specialist knowledge of mass balance and peatland ecohydrology In-depth understanding of biogeochemical processes and the position and role of peatlands in the landscape Advanced skills related to the research, presentation and discussion of scientific topics
Module contents	<p>Lecture: Energy and Matter Dynamics of Peatlands</p> <ul style="list-style-type: none"> Peat and the creation of peat Peat creation rates and how these are determined Peat: biomass or fossil fuel? Impacts of peatlands on the climate pH, soil reaction and acidity Redox chemistry, denitrification and pyrite formation Chemistry of water and peat Organic geochemistry, humus chemistry, humification and coalification Permafrost <p>Seminar: Peatland Ecohydrology</p>

	<ul style="list-style-type: none"> • Ecohydrology: fundamentals of an application-driven discipline • Plants, water and peat accumulation • Site hydrology and substance conversion processes • Water chemistry, nutrients and vegetation • Indicator values (Ellenberg) and vegetation types • Groundwater flows and composition • Hydrological buffer zones and modelling • Hydrogenetic peatland types • Self-organisation and self-regulation in peatlands • Regional relationships between peatlands, the climate, water and landscape 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Energy & Matter Dynamics (L)	2	30	120	180
	Peatland Ecohydrology (S)	2	30		
Assessment components	Examination and/or graded coursework: Oral examination (25 min) on the module content				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Annually, in winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E3.11: Quaternary Palaeoecology	
Person responsible	Head of the Peatland Science working group
Language	English
Qualification objectives	<ul style="list-style-type: none"> • Knowledge of the methods used in Quaternary palynology • Overview of the fundamentals, methods and areas of application in palaeoecology • Advanced skills related to the research, presentation and discussion of scientific topics
Module contents	Seminar: Palaeoecology

	<ul style="list-style-type: none"> • Time and concepts of time • Long-term aspects of ecology, long-term research • Philosophy and fundamentals of palaeoecology • Archives: non-stratigraphic vs stratigraphic archives; cultural archives; natural archives • Fossils and taphonomy: archivalia, microfossils, macrofossils, inorganic and organic substances • Methods: historic ecology; palynology; palaeobotanics and dendrochronology; palaeozoology; inorganic and organic geochemistry • Dating methods <p>Lecture/Seminar/Practical Lab: Quaternary Palynology</p> <ul style="list-style-type: none"> • Morphology of the key Central European types of pollen, spores and other remnants • Analysis and interpretation of pollen samples using a surface transect • Production, emission, distribution, deposition and sedimentation of pollen and spores • Pollen associations, pollen diagrams and their interpretation • Palynological analysis of a peat and lake sediment profile • Applied palynology: aeropalynology, vegetation history, historical plant geography, climate history, cultural history, dating • Presentation and interpretation of own analysis results: • integrative palaeoecological case studies 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Palaeoecology (S)	2	30	90	180
Large practical lab: Quaternary palynology (S/PL)	4	60			
Assessment components	Examination and/or graded coursework: Presentation (Palaeoecology, 20 min)				
	Ungraded coursework: Report* (Quaternary Palynology, 10 pages)				
Regular examination date	3rd semester				
Offered	Every other year: L/S in the winter semester; L/S/PL as a block course during the lecture-free period in the winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				

Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC

Elective module E3.12: Peatlands and Palaeoecology					
Person responsible	Head of the Peatland Science working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> • Knowledge of the methods used in macrofossil analysis • In-depth insights into peatland literature • Advanced skills related to the research, presentation and discussion of scientific topics 				
Module contents	<p>Large practical lab: Macrofossil Analysis</p> <ul style="list-style-type: none"> • Conditions required to preserve plant remains; preservable plant species, organs and tissues; growth modus of certain peatland plants and the resulting morphology of their remains; characteristic tissue types and their differentiation • Possibilities and limitations of determining peat profiles in the field; peat and peatland “systematics” • Laboratory methods • Characteristic plant remains and their (macro)morphological and microscopic histological differences: herbaceous peatland plants, mosses, dwarf shrubs, woods and barks, fruits and seeds • Macrofossil analysis of a peat profile <p>Seminar: Peatland Ecology</p> <ul style="list-style-type: none"> • Study of selected topics in landscape ecology and peatland studies • Exposition of the results in a presentation 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Large practical lab: Macrofossil Analysis (S/PL)	3	45	105	180
	Peatland Ecology (S)	2	30		
Assessment components	Examination and/or graded coursework: Presentation (Seminar: Peatland Ecology, 20 min)				

	Ungraded coursework: Report* (Macrofossil Analysis, 10 pages)
Regular examination date	3rd semester
Offered	Every other year: S/PL as a block course during the lecture-free period in the winter semester; S in the following summer semester
Duration	2 semesters
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC

Elective module E3.13: Peatland Science					
Person responsible	Head of the Peatland Science working group				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> • Overview of peatlands and their significance • Practical knowledge and experience of field methods 				
Module contents	<p>Lecture: Peatland Science</p> <ul style="list-style-type: none"> • Peatland and peat: terms and definitions • Peatland classification and terminology • Peatland prevalence • Significance of peatlands (i.e. use of peatlands, ecosystem services, biodiversity) • Peatland conservation • Peatlands in the landscape • Paludiculture <p>Practical: Peatland Field Methods</p> <ul style="list-style-type: none"> • Levelling with a water level gauge • Vegetation analysis • Determining water quality levels • GEST determination • Peatland drilling • Peat examination • Setting and measuring streamflow levels • Measuring greenhouse gas flows • Peat analysis • Landscape interpretation 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload

	Lecture: Peatland Science (L)	2	30	105	180
	Large practical lab: Peatland Field Methods (Pra)	3	45		
Assessment components	Examination and/or graded coursework: Written examination (Peatland Science, 60 min)				
	Ungraded coursework: Report* (Peatland Field Methods, 10 pages)				
Regular examination date	2nd semester				
Offered	Annually; L in the summer semester; PL as a block course during the lecture-free period in the summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E3.14: Ecology & Protection of Ecosystems in the Southern Hemisphere & the Tropics	
Person responsible	Sustainability Officer of the Rectorate
Language	English
Qualification objectives	<ul style="list-style-type: none"> ▪ Knowledge of key processes, functions, developments, problems and management alternatives for important ecosystems in the Southern Hemisphere and the Tropics from an interdisciplinary perspective (incl. tropical and subtropical forests, savannas, steppes, tundras, deserts, wetlands, lakes, agrarian ecosystems and pasture ecosystems) and exploration using case studies ▪ Knowledge of ecosystem types of particular relevance to climate change issues and biodiversity preservation, along with a complex understanding of key related ecological problems and potential solutions ▪ Exercise in open, interactive teaching methods
Module contents	<ul style="list-style-type: none"> • Ecological fundamentals and central issues • Preservation of biodiversity in (sub)tropical forests

	<ul style="list-style-type: none"> • Climate relevance of landscape change in cold regions of the Southern Hemisphere • Protection and renaturation of tropical wetlands • Desertification, overgrazing and erosion • Analysis of complex interrelationships in landscape ecology based on specific regional case studies of the Tropics and the Southern Hemisphere 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Ecology & Protection of Ecosystems in the Southern Hemisphere & the Tropics (L/S)	2	30	120	180
	Protection of Selected Ecosystems in the Southern Hemisphere & the Tropics (S/Pra)	2	30		
Assessment components	Examination and/or graded coursework: 1 presentation (individual, 20 min)				
	Ungraded coursework: 1 presentation* (as a group, 20 min)				
Regular examination date	3rd semester				
Offered	Every other year, in the winter semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Fundamental knowledge of ecosystem types and vegetation on Earth				
Module can be selected for	M.Sc. LENC				

Elective module E4.1: Bodenökologie [Soil Ecology]	
Person responsible	Head of the Geoecology and Soil Geography working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> ▪ Acquisition of fundamental understanding of soil ecology against a general geoecological background ▪ Practical experience of fieldwork with soil (supervised group work) ▪ Learning about the systematic, conceptual approach and acquisition of specific soil-related mapping skills in fieldwork

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	<ul style="list-style-type: none"> Independent design of a study in the area of soil ecology 				
Module contents	<ul style="list-style-type: none"> Soil ecology case studies focusing on catenas from selected pedolandsapes in a tropical setting Independent depiction of individual (pedo)landsapes along glacial series or altitudinal zones Conservation aspects in ecologically valuable regions, e.g. ancient European beech forests and their soils 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Bodenökologisches Praktikum (PL)	4	60	120	180
Assessment components	Examination and/or graded coursework: Exercises* (20 pages)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E4.2: Naturräume Osteuropas [Natural Environments of Eastern Europe]	
Person responsible	Head of the Geoecology and Soil Geography working group
Language	German
Qualification objectives	<ul style="list-style-type: none"> Knowledge of the regional characteristics of Eastern Europe as a region of specialisation of the University of Greifswald Ability to implement knowledge of regional geography in independent, sustainability-related projects Application of complex geoecological working methods in field-based conditions abroad Establishment of contacts and preparation for independent (professional) activities against the backdrop of wide-ranging activities in Greifswald in the area of Eastern European ecology
Module contents	<ul style="list-style-type: none"> Production of an overview of sites in a sub-area of Eastern Europe with particular focus on soils and natural landscapes and/or nature reserves (and beech forests) Further examination of the selected area from the perspective of geoecology/sustainability geography, including students' own field research Specific site studies using soil as a mirror for the Eastern European landscape

	<ul style="list-style-type: none"> Research conducted in supervised groups in the specific conditions of Eastern Europe 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Large practical lab: Naturräume Osteuropas (PL)	4	60	120	180
Assessment components	Examination and/or graded coursework: Exercises* (20 pages)				
	Ungraded coursework: -				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC				

Elective module E4.3: Remote Sensing					
Person responsible	Head of the Earth Observation and Geoinformation Science Lab				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> Basic knowledge of creating aerial and satellite images as well as processing and analysing them including physical and informatic principles Basic knowledge of digital geodata and image processing to analyse and interpret aerial and satellite images 				
Module contents	<ul style="list-style-type: none"> Sample applications of remote sensing in geographic environmental research, physical principles of remote sensing and spectroscopy as well as relevant imaging systems, principles of image interpretation, digital data pre-processing and analysis, vegetation analysis, image classification and change analysis Computer-aided, problem-based work on lecture content with a large proportion of software-based analyses 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture/ Practical: Remote Sensing	4	60	120	180
Assessment components	Examination and/or graded coursework: Exercises (24 pages – divided into 12 x 2 pages) on the lecture/practical				
	Ungraded coursework: -				

Regular examination date	3rd semester
Offered	Annually, winter semester
Duration	1 semester
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC, M.Sc. BEE

Elective module E4.4: Applied Remote Sensing/Geoinformation Science with field work					
Person responsible	Head of the Earth Observation and Geoinformation Science Lab				
Language	English				
Qualification objectives	<ul style="list-style-type: none"> ▪ In-depth knowledge of selected subject content from geo-information processing and remote sensing, e.g. in the areas of geo-data processing and analysis, space-time modelling, land use and land cover analysis, spectroscopy and digital image processing ▪ Transfer of theoretical knowledge and methodological skills to various applied examples ▪ Ability to carry out a project in the area of geoinformation processing and remote sensing, including data collection, field work and processing of the findings 				
Module contents	<ul style="list-style-type: none"> ▪ Practical lab: Carrying out a project in the area of geo-information processing and remote sensing (focus topic changes annually), including field work 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Practical lab: Applied Remote Sensing/Geoinformation Science with field work	3	45	135	180
Assessment components	Examination and/or graded coursework: Scientific report (10 pages) on the practical lab course				
	Ungraded coursework: Exercises (15 pages)				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				

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Recommended previous knowledge	Students must either have completed the Remote Sensing module or have extensive knowledge of GIS technologies
Module can be selected for	M.Sc. LENC, M.Sc. BEE

Elective module E4.5: Advanced Field Skills					
Person responsible	Head of the Landscape Ecology and Ecosystem Dynamics working group				
Language	English or German				
Qualification objectives	<ul style="list-style-type: none"> ▪ Students acquire the fundamental and advanced knowledge needed to plan and conduct scientific field work with confidence ▪ Students gain an overview of common navigation and recording techniques as well as data recording systems 				
Module contents	<ul style="list-style-type: none"> • Orientation and navigation with and without a map, compass or GPS • Introduction to differential GPS techniques • Mapping and field recordings • Introduction to data logging and the installation of permanent scientific infrastructure • Field books and recordings • Safety when conducting field work / first aid • Survival skills 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Advanced Field Skills (PL)	4	60	120	180
Assessment components	Practical examination* (120 min)				
Regular examination date	2nd semester				
Offered	Summer or winter semester				
Duration	1 semester (blocked)				
Admission requirements	Limited number of spaces: participation subject to approval from responsible module teacher and completion of a first aid course in the last year				
Recommended previous knowledge	None				
Module can be selected for	M.Sc. LENC, M.Sc. Earth Science				

Elective module E4.6: Projektmanagement [Project Management]	
Person responsible	Chair of Sustainability Science and Applied Geography
Language	German
Qualification objectives	<ul style="list-style-type: none"> • Students acquire subject-specific knowledge of basic project management methods and procedures • Students are capable of conducting different projects in a strategic, systematic and efficient manner

	<ul style="list-style-type: none"> • By practising critical self-evaluation, students are capable of preventing risks and continuously refining projects • Students gain an awareness of the topics of sustainability and participation as they pertain to all projects • Students can adapt flexibly to different project environments and are capable of working in a team to develop creative solutions to problems 				
Module contents	<p>Seminar: Projektmanagement I – Theorie [Project Management I – Theory]</p> <ul style="list-style-type: none"> • Theoretical fundamentals and exercises in the areas of project planning, financial and risk management, staff and teams, communication and quality management • Presentation and discussion of various project management methods and tools using examples from the areas of conservation, development assistance, research, education and campaigns <p>Seminar: Projektmanagement II – praktische Anwendung [Project Management II – Practical Application]</p> <ul style="list-style-type: none"> • Independent planning, implementation and assessment of the student's own project/development of a project plan • Application of different project management instruments • Teamwork enables students to practise their social skills 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Projektmanagement I – Theorie (S)	2	30	120	180
	Projektmanagement II – praktische Anwendung (S)	2	30		
Assessment components	Examination and/or graded coursework: Coursework essay (20 pages)				
	Ungraded coursework: Presentation* (20 min)				
Regular examination date	2nd semester				
Offered	Annually, in summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				
Recommended previous knowledge	Very good practical knowledge of Microsoft Office applications (Word, Excel and especially PowerPoint)				
Module can be selected for	M.Sc. LENC, M.Sc. Sustainable Geography				

Elective module E4.7: Nachhaltigkeit gestalten [Shaping Sustainability]					
Person responsible	Chair of Sustainability Science and Applied Geography				
Language	German				
Qualification objectives	<ul style="list-style-type: none"> ▪ Broad knowledge of various fields of action in sustainable geography (climate change, biodiversity, conservation) ▪ Knowledge of the fundamentals of environmental policy ▪ Theoretical, contextual and methodological knowledge of research in the area of global change ▪ Practical experience in the implementation of sustainability science, achieved through group discussions and group work ▪ Ability to discuss topics of sustainability science 				
Module contents	<p>Seminar: Nachhaltigkeitsprobleme [Sustainability Problems]</p> <ul style="list-style-type: none"> • Physical and social causes and consequences of global change • Insights into numerous scientific perspectives, methods and theories that allow us to recognise and measure global change (incl. the syndrome approach) <p>Seminar: Nachhaltigkeit gestalten [Shaping Sustainability]</p> <ul style="list-style-type: none"> • Examination, analysis and extensive evaluation of existing and potential solution approaches that attempt to mitigate the negative consequences of global change, discussion of innovative solutions approaches – including by examining the original texts 				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Seminar: Nachhaltigkeitsprobleme	2	30	120	180
	Seminar: Nachhaltigkeit gestalten	2	30		
Assessment components	Examination and/or graded coursework: Presentation (20 min) on the Sustainability Problems seminar				
	Ungraded coursework: Exercises* (20 pages) on the Shaping Sustainability seminar				
Regular examination date	2nd semester				
Offered	Annually, summer semester				
Duration	1 semester				
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher				

Recommended previous knowledge	None
Module can be selected for	M.Sc. LENC, M.Sc. Sustainable Geography

Elective module E4.8: Modern Foreign Languages and Technical Terminology	
Person responsible	Teaching staff at the University Language Centre
Qualification objectives	<p>Students acquire fundamental skills (level A1 to B1 of the Common European Framework of Reference for Languages (CEFR)) or advanced skills in modern foreign languages (from level B2 onwards).# In technical language courses, students acquire knowledge of selected specificities of technical language in landscape ecology/geosciences at the word, sentence and text level. They become able to comprehend authentic subject-specific texts using differentiated reading and listening strategies. They learn to express themselves effectively in specific academic and professional situations, participate in discussions and give presentations on specialist content.</p> <p>The Conference Skills and Academic Writing courses (level B2 or C1) teach students to communicate in a stylistically appropriate and terminologically correct manner in English in situations involving scientific communication.</p>
Module contents	<p>Modern foreign language exercises (levels A1 to B1) in line with CEFR requirements</p> <p>Foreign language courses (levels B2 & C1):</p> <ul style="list-style-type: none"> • Introduction to technical language in the foreign language in the area of landscape ecology/geosciences • Fundamental subject-specific terminology • Relevant grammatical structures, pronunciation of specialist terminology • Subject-specific text types • Reading and listening strategies • Development of (oral and written) linguistic skills • Topic areas: basic terms and problems in the specialist discipline • Linguistic functions: Formulating and discussing subject-specific issues; expressing advantages and disadvantages; developing standpoints; drawing conclusions, and much more <p>Course: Conference Skills (CE)</p> <ul style="list-style-type: none"> • Development of speaking skills in scientific contexts • Presentation and discussion using English technical language in academic contexts <p>or</p> <p>Course: Academic Writing (CE)</p>

	<ul style="list-style-type: none"> • Development/improvement of writing skills using English technical language • Expansion of specialist academic vocabulary • Structuring of texts at different levels (sentence, paragraph, etc.) • Critical engagement with specialist academic literature 				
Classes	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Modern Foreign Language/Technical Language	4	60	90	180
	Conference Skills (CE) or Academic Writing (CE)	2	30		
Assessment components	Examination and/or graded coursework for Modern Foreign Language/Technical Language: written examination (100 min) or portfolio (3–4 assessments to verify different linguistic skills, such as listening, comprehension, speaking and writing)				
	Ungraded coursework: Conference Skills: presentation* with subsequent discussion (20 min). Academic Writing: written examination (60 min for B2 / 90 min for C1)				
Regular examination date	3rd semester				
Offered	Annually				
Duration	1 or 2 semesters				
Prerequisites					
Recommended previous knowledge	<p>For Modern Foreign Language courses: A1: no previous knowledge. A2: language skills at A1 level. B1: language skills at A2 level.</p> <p>For Technical Language courses: language skills at least at B1 or B2 level.</p>				
Module can be selected for	M.Sc. LENC				

Foreign language courses are offered in English or, depending on the current course offering, also in other modern foreign languages.

Elective module E4.9: Internship (external work placement)	
Person responsible	Chairperson of the Examination Board
Qualification objectives	Students gain insights into the activities and requirements of potential professional fields they could move into after securing an M.Sc. in Landscape Ecology, helping them to make decisions in relation to career orientation. They gain insights into the organisational, social and professional structures of the supervising

	institution and contribute to tasks at the supervising institution.			
Module contents	A work placement can include the following aspects: <ul style="list-style-type: none"> • Effective planning of workflows • Collaboration on work processes and fields of activity at the supervising institution • Own studies on a defined issue • Preparation and presentation of obtained results 			
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	Contact time	Self-study	Total workload
	Completion of independent work tasks at an external institution and related follow-up work (4 weeks)	150	30	180
Assessment components	Examination and/or graded coursework: Internship report* (10 pages)			
	Ungraded coursework: Written confirmation (no defined format) from the supervising institution that the student has successfully completed their internship (CA*)			
Regular examination date	3rd semester			
Offered	Continuously; students can complete an internship at a research institute, private company, public authority, nature reserve management office, association or other suitable institution, either in Germany or abroad.			
Duration	1 semester			
Recommended previous knowledge	None			
Module can be selected for	M.Sc. LENC			

Elective module E4.10: Mobility Module	
Person responsible	Chairperson of the Examination Board
Language	English and others
Qualification objectives	<ul style="list-style-type: none"> ▪ Gaining insights into different scientific, political and cultural environments ▪ Developing intercultural communication skills in science practice and management ▪ Extending knowledge across several scientific disciplines beyond the offer of the University of Greifswald
Module contents	The content of this module covers topics selected from the full scope of the Landscape Ecology and Nature Conservation degree course, in particular from the disciplines of Botany, Zoology, Ecology, Forestry, Geography, Geology and other disciplines of natural and social sciences. Dependent on the level of interest, and

	after agreement with the Chairperson of the Examination Board, a student can undertake a period of study abroad at a recognised institution of their own choice such as external universities and research institutes. The precise activities and module content are defined at the beginning of the course, together with a Learning Agreement between the Chairperson of the Examination Board and the student. The module can be selected a maximum of five times .				
Classes (in ECTS, SWS and h)	Students must acquire 6 ECTS	SWS	Contact time	Self-study	Total workload
	Lecture/Seminar/Practical	4	60	120	180
Assessment components	Examination and/or graded coursework: examinations and marked coursework at guest universities are recognised in accordance with the Learning Agreement and Transcript of Records				
	Ungraded coursework: -				
Regular examination date	3rd semester				
Offered	Upon consultation				
Duration	1 semester				
Admission requirements	Consultation with the Chairperson of the Examination Board				
Module can be selected for	M.Sc. LENC				

Module: Master's Dissertation		
Person responsible	Chairperson of the Examination Board	
Language	English, German	
Qualification objectives	Students demonstrate that they: possess in-depth knowledge in the planning of a complex research task; are capable of formulating and independently implementing a research programme; and have the skills to present the results of a research project in writing and to present and discuss these results in an oral defence.	
Module contents	<ul style="list-style-type: none"> • Development and presentation of a work plan • Literature study • Development of a methodological strategy to solve the assigned task • Carrying out the task and applying suitable evaluation methods • Discussing the results and integrating them into topical context • Writing up of the master's dissertation • Defence 	
Classes	Students must acquire 30 ECTS	Total workload
	Master's dissertation (Block: 6 months; 28 ECTS)	900
	Defence (S; 2 ECTS)	
Assessment components	Written production of the M.Sc. dissertation Defence: presentation and discussion of the results	
Regular examination date	4th semester	

Offered	By arrangement
Duration	1 semester
Admission requirements	Limited number of spaces available, participation subject to approval from responsible module teacher
Recommended previous knowledge	Basic and elective modules
Module can be selected for	M.Sc. LENC