



Coordination Erasmus and Study Abroad

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Incoming
 Biology Students

November 2019

Master courses in English

The following courses are open for incoming exchange students of the Faculty of Biology. They are given in English, a language proof of at least English knowledge level C1 is required.

You can select the courses as Master student (and Bachelor student in case of eligibility) if you meet subject specific requirements indicated under 'remarks'.

Information to the modules (content, workload, prerequisites etc.) can be found in the module catalogue below. Inform yourself carefully before choosing a module.

In addition, check the semester dates using UniVZ whilst choosing a module in order to avoid overlap of lectures and courses. Our "Guide for exchange students" contains information on using UniVZ. In case the semester dates are not available yet, simply contact us.

- [UniVZ](#)

- [Guide for exchange students of biology](#)

Courses available in winter term				
Number	Name	ECTS	Type	Remarks
<i>Acronyms for course type: L = lecture, P = practical course, T = tutorial, S = seminar</i>				
M. Sc. Molecular Life Sciences: Microbiology, Biotechnology and Biochemistry				
M.Bio.141+S	General and applied microbiology	6	L, S	
M.Bio.141	General and applied microbiology	3	L	
M.Bio.142	Molecular genetics and microbial cell biology	3	L	
M.Bio.158	Enzyme catalysis and biological chemistry	3	L	
M.Bio.142+S	Molecular genetics and microbial cell biology	6	L, S	
M. Sc. Developmental, Neural and Behavioral Biology				
M.Bio.344	Neurobiology 1	3	L	
M.Bio.348	Human genetics	6	L, S	
M.Bio.359	Development and plasticity of the nervous system	3	L	
M.Bio.360	Development and plasticity of the nervous system	3	S	requires M.Bio.359
M.Bio.366	Introduction to behavioral biology	3	L	
M.Bio.369	Human genetics	3	L	
M.Bio.392	Current Developmental Biology	6	L, T, S	
M.Bio.393	Current Developmental Biology	3	L, T	
M. Sc. Biodiversity, Ecology and Evolution				
M.Biodiv.402	Plant ecology and ecosystem research	6	L, S	optional seminar in summer term
M.Biodiv.403	Vegetation ecology and vegetation history	6	L, S	
M.Biodiv.404	Animal ecology	6	L, S	optional seminar in summer term
M.Biodiv.406	Regional vegetation ecology and phytodiversity	6	L, S	optional seminar in summer term
M.Biodiv.412	Nature conservation biology	6	L, S	optional seminar in summer term

M.Biodiv.415	Evolutionary biology	6	L	part of the lecture takes place in summer term
M.Biodiv.419	Pro- and eukaryotic algae: Algae and lichens	6	L, S, P	practical course takes place in summer term as an excursion
M.Biodiv.421	Plant ecology: Project course ecology of plants	6	L, P	as block course
M.Biodiv.425	Evolution of embryophyta	6	L, S	
M.Biodiv.430	Vegetation history: Project study in palaeoecology and palynology	6	L, P	
M.Biodiv.441	Animal ecology: Evolutionary ecology	6	L, P	
M.Biodiv.450	Plant Ecology: Impact of global climate change on plant communities and their functional traits	6	L, P	as block course
M.Biodiv.480	Nature conservation biology: Nature conservation inventories	6	L, P	as block course
M.Biodiv.481	Nature conservation biology: Population biology in nature conservation	6	L, P	
M.Biodiv.483	Nature conservation biology: Assessment of wildlife species for nature conservation	6	L, P	
M.Biodiv.491	Next generation sequencing for evolutionary biology (requires M.Biodiv.425)	6	L, S, P	

Courses available in summer term				
Number	Name	ECTS	Type	Remarks
<i>Acronyms for course type: L = lecture, P = practical course, T = tutorial, S = seminar</i>				
M. Sc. Molecular Life Sciences: Microbiology, Biotechnology and Biochemistry				
M.Bio.144	Cellular and molecular biology of plant-microbe interactions	3	L	
M.Bio.156	Structural biochemistry	3	L	
M.Bio.144+S	Cellular and molecular biology of plant-microbe interactions	6	L, S	
M.Bio.156+S	Structural biochemistry	6	L, S	
M. Sc. Developmental, Neural and Behavioral Biology				
M.Bio.394	Frontiers in Neural Development	6	L, T, S	
M.Bio.395	Frontiers in Neural Development	3	L, T	
M. Sc. Biodiversity, Ecology and Evolution				
M.Biodiv.408	Primate ecology	6	L, P	as block course
M.Biodiv.422	Plant ecology: CO ₂ - and H ₂ O-balance of trees	6	L, P	
M.Biodiv.423	Plant ecology: Study of habitats	6	L, P	
M.Biodiv.426	Reproduction and evolution of flowering plants	6	L, P	
M.Biodiv.431	Vegetation ecology: Applied vegetation ecology & multivariate analysis	6	L, S	
M.Biodiv.437	Methods in paleoecology	6	L, S, P	
M.Biodiv.442	Animal ecology: Synecology of animals	6	L, P	
M.Biodiv.445	Animal ecology: Molecular analysis of tropic interactions in soil food webs	6	L, P	
M.Biodiv.446	Molecular zoology and insect biotechnology	6	L, S, P	
M.Biodiv.488	Nature conservation biology: Ornithology	6	L, P	

Georg-August-Universität Göttingen		3 C
Module M.Bio.141: General and applied microbiology		3 WLH
Learning outcome, core skills: Learning outcome: Evolution and phylogenetic system; morphology and cell biology; communities and biocoenosis of bacteria and archaea; gene expression and molecular control (transcription, translation); posttranslational control, protein stability and proteomics; genetic networks; molecular switches and signal transduction; microbial developmental biology; mechanisms of pathogenicity of important pathogens; development of new antimicrobial agents; diversity of the metabolism in bacteria and archaea as basis for biotechnological applications; industrial microbiology. Core skills: Knowledge of microorganisms relevant for biotechnology and medicine, ability to identify these organisms and to analyse them with molecular methods.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: lecture: General and applied microbiology (Lecture)		3 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: detailed knowledge in cell biology, biochemistry and genetics of procaryotic microorgansims		
Admission requirements: can't be combined with core module M.Bio.101	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Jörg Stülke	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 10		

Georg-August-Universität Göttingen	3 C 3 WLH
Module M.Bio.142: Molecular genetics and microbial cell biology	
Learning outcome, core skills: Advanced knowledge of Molecular Genetics and microbial cell biology through case studies of model systems of molecular mycology (yeasts and filamentous fungi). Acquisition of knowledge up to the "Review" level in one topic.	Workload: Attendance time: 42 h Self-study time: 48 h
Course: Molecular genetics and microbial cell biology (Lecture)	3 WLH
Examination: Written examination (120 minutes)	3 C
Examination requirements: detailed knowledge in cell biology, biochemistry and genetics of eucaryotic microorganisms	
Admission requirements: Can't be combined with Core Module M.Bio.102	Recommended previous knowledge: <ul style="list-style-type: none"> • Watson, Molecular Biology of the Gene, Pearson, 6th Edition • Alberts, Molecular Biology of the Cell, Garland, 5th Edition
Language: English	Person responsible for module: Prof. Dr. Gerhard Braus
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 10	

Georg-August-Universität Göttingen		3 C 3 WLH
Module M.Bio.144: Cellular and molecular biology of plant-microbe interactions		
Learning outcome, core skills: Introduction into theory and methods for the analysis of plant-microbe interactions on the cell biological and molecular level.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: lecture: Plant-microbe-interactions (Lecture)		3 WLH
Examination: Written examination (54 minutes)		
Examination requirements: knowledge of basic concepts in plant-microbe-interactions		
Admission requirements: Can't be combined with core module M.Bio.104	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Christiane Gatz Prof. Dr. Volker Lipka	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 10		

Georg-August-Universität Göttingen		3 C
Module M.Bio.156: Structural biochemistry		3 WLH
Learning outcome, core skills: Methods in Structural Biology, structure and function of biological macromolecules. Structure and folding of proteins, structure-function relationships, protein-protein and protein-nucleic acid complexes. Structure-based drug-design		Workload: Attendance time: 42 h Self-study time: 48 h
Course: lecture: Structural Biology (Lecture)		3 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: The students show that they know the basics of structural biology. They are familiar with biochemical and analytical methods in protein and macromolecular complex- analysis. They have deepened knowledge about selected proteins and protein complexes. The students know the basics in structural resolution and structural characteristics of proteins.		
Admission requirements: can't be combined with M.Bio.105	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Ralf Ficner	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 10		

Georg-August-Universität Göttingen	3 C 3 WLH
Module M.Bio.158: Enzyme catalysis and biological chemistry	
Learning outcome, core skills: Catalytic mechanisms of enzymes, mechanisms of macromolecular complexes, biocatalysis, kinetics und thermodynamics of biochemical reactions, chemical model systems of enzymes, synthesis of biooligomers, synthesis of ligands, ligation techniques, array technologies	Workload: Attendance time: 42 h Self-study time: 48 h
Course: lecture: Enzyme Catalysis and Chemical Biology (Lecture)	3 WLH
Examination: Written examination (90 minutes)	3 C
Examination requirements: <ul style="list-style-type: none"> • knowledge about kinetics and thermodynamics of biochemical reactions • knowledge about different organic synthesis mechanisms • knowledge about catalytic mechanisms of enzyme 	
Admission requirements: can't be combined with M.Bio.107	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Dr. Kai Tittmann
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 10	

Georg-August-Universität Göttingen		3 C 2 WLH
Module M.Bio.344: Neurobiology 1 (key competence module)		
Learning outcome, core skills: Profound knowledge of essential techniques in molecular, cellular and systemic neuroscience and their application.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: From gene to behavior (Lecture)		2 WLH
Examination: Written examination (120 minutes)		3 C
Examination requirements: Theoretical knowledge of the basic methods in neuroscience based on the contents of the lecture.		
Admission requirements: can't be combined with module M.Bio.304	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Martin Göpfert	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 27		

Georg-August-Universität Göttingen	6 C 4 WLH
Module M.Bio.348: Human genetics (key competence module)	
Learning outcome, core skills: Profound knowledge of specific human genetic aspects and principles of research in human genetics. Understanding of the methods for identification, analysis and manipulation of genes and gene functions. Basic insights into the structure and function of the human genome. Critical analysis of results from scientific publications. Scientific presentation and discussion of data.	Workload: Attendance time: 56 h Self-study time: 124 h
Course: Human genetics II (Lecture)	2 WLH
Course: Tumor genetics; Reproduction genetics; Stem cells (Seminar) participation in two of the offered seminar series	2 WLH
Examination: written examination (60 min) and oral presentation (ca. 45 min)	6 C
Examination requirements: Profound knowledge of specific aspects and the basic principles in human genetic research. Analysis and presentation of scientific data.	
Admission requirements: can't be combined with core module M.Bio.309 or key competence module M.Bio.369	Recommended previous knowledge: none
Language: English	Person responsible for module: PD Dr. rer. nat. Anja Uhmann
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 12	

Georg-August-Universität Göttingen		3 C 2 WLH
Module M.Bio.359: Development and plasticity of the nervous system (lecture)		
<p>Learning outcome, core skills: The basics of the development and plasticity of the vertebrate nervous system are presented. Special emphasis is on the 3 following subjects:</p> <p>i) early development of the nervous system (induction and pattern formation, formation and survival of nerve cells, development of specific axonal projections, synaptogenesis), ii) developmental plasticity (experience- and activity-dependent development of the brain, critical periods) and iii) adult plasticity and regeneration (learning-induced plasticity, cellular mechanisms of plastic changes, neurogenesis, therapies after brain lesions). Deepened knowledge, up-to-date research results and understanding of scientific approaches in the field of the development and plasticity of the nervous system.</p>		<p>Workload: Attendance time: 28 h Self-study time: 62 h</p>
Course: lecture: Development and plasticity of the nervous system (Lecture)		2 WLH
Examination: Oral examination (approx. 15 minutes)		3 C
<p>Examination requirements: Profound knowledge of recent research and understanding of scientific methods in the field of development and plasticity of the nervous system.</p>		
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Siegrid Löwel	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 35		

Georg-August-Universität Göttingen Module M.Bio.360: Development and plasticity of the nervous system (seminar)	3 C 2 WLH
Learning outcome, core skills: The students learn to present up-to-date publications on the development and plasticity of the nervous system and to discuss the results critically in a seminar report. Deepened knowledge, up-to-date research results and understanding of scientific approaches in the field of the development and plasticity of the nervous system. Critical discussion of up-to-date literature, scientific debate, sharpening of critical thought, promotion of multidisciplinary. Training in presentation techniques and scientific writing.	Workload: Attendance time: 28 h Self-study time: 62 h
Course: seminar: Development and plasticity of the nervous system (Seminar)	2 WLH
Examination: oral presentation (~ 20 min) and essay (~ 8 pages)	3 C
Examination requirements: Profound knowledge of recent research and scientific methods in the field of development and plasticity of the nervous system.	
Admission requirements: attendance of M.Bio.359	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Dr. Siegrid Löwel
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 15	

Georg-August-Universität Göttingen		3 C
Module M.Bio.366: Introduction to behavioral biology (key competence module)		3 WLH
Learning outcome, core skills: Profound knowledge of basic concepts in behavioral biology with special emphasis on behavioral ecology, sociobiology and cognition. Special consideration of the quantitative aspect of behavioral research. Students are able to present and discuss scientific issues in written form.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: Introduction to behavioral biology (Lecture)		2 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: Profound knowledge of basic concepts and the quantitative aspect of behavioral research		
Admission requirements: can't be combined with core module M.Bio.306 or key competence module M.Bio.346	Recommended previous knowledge: none	
Language: English	Person responsible for module: Dr. Cornelia Kraus	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 4		

Georg-August-Universität Göttingen	3 C 2 WLH
Module M.Bio.369: Human genetics (key competence module)	
Learning outcome, core skills: Profound knowledge of specific human genetic aspects and principles of research in human genetics. Understanding of the methods to identify, analyze and manipulate genes and their function. Basic insights into the structure and function of the human genome.	Workload: Attendance time: 28 h Self-study time: 62 h
Course: Human genetics II (Lecture)	2 WLH
Examination: Written examination (60 minutes)	3 C
Examination requirements: Profound knowledge of specific aspects and the basic principles in human genetic research.	
Admission requirements: can't be combined with core module M.Bio.309 or key competence module M.Bio.348	Recommended previous knowledge: none
Language: English	Person responsible for module: PD Dr. rer. nat. Anja Uhmann
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 10	

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Bio.392: Current Developmental Biology		
Learning outcome, core skills: Learning objectives: In depth knowledge of theoretical principles in developmental genetics, biochemistry, and biology as well as of practical methodology in analyzing morphogenetic and pattern formation processes. Understanding of methods to identify and analyze gene function as well as manipulate embryos. Knowledge of databases for <i>in silico</i> sequence analysis and model system specific databases. Insights into the evolution of developmental processes.		Workload: Attendance time: 56 h Self-study time: 124 h
Course: Developmental biochemistry, genetics, and biology (Lecture)		2 WLH
Course: Exercises to and consolidation of lecture contents (tutorial)		1 WLH
Course: Current Topics in Developmental Biology (Seminar)		1 WLH
Examination: Written examination (90 minutes) Examination prerequisites: Oral presentation of a publication (ca. 20 min)		6 C
Examination requirements: Advanced knowledge of principles in developmental genetics, biochemistry, and biology with emphasis on morphogenetic and pattern formation processes as well as focus on signal cascades and gene networks that control developmental processes. Understanding of techniques to identify, analyze, and manipulate the function of developmental genes as well as developmental processes. Knowledge of diverse model organisms with their strength and weaknesses. Application of this knowledge to new scientific questions.		
Admission requirements: cannot be combined with M.Bio.321 or M.Bio.393	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Ernst A. Wimmer	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 5		

Georg-August-Universität Göttingen		3 C
Module M.Bio.393: Current Developmental Biology		3 WLH
Learning outcome, core skills: In depth knowledge of theoretical principles in developmental genetics, biochemistry, and biology as well as of practical methodology in analyzing morphogenetic and pattern formation processes. Understanding of methods to identify and analyze gene function as well as manipulate embryos.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: Developmental biochemistry, genetics, and biology (Lecture)		2 WLH
Course: Exercises to and consolidation of lecture contents (tutorial)		1 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: Advanced knowledge of principles in developmental genetics, biochemistry, and biology with emphasis on morphogenetic and pattern formation processes as well as focus on signal cascades and gene networks that control developmental processes. Understanding of techniques to identify, analyze, and manipulate the function of developmental genes as well as developmental processes. Knowledge of diverse model organisms with their strength and weaknesses. Application of this knowledge to new scientific questions.		
Admission requirements: cannot be combined with M.Bio.321 or M.Bio.392	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Ernst A. Wimmer	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 5		

Georg-August-Universität Göttingen		6 C
Module M.Bio.394: Frontiers in Neural Development		4 WLH
<p>Learning outcome, core skills:</p> <p>Learning outcome: In-depth knowledge of neural development of insects. In-depth knowledge of principles and mechanisms of neural development of vertebrates and insects (among others: regionalization of the neuroectoderm, axon guidance, synaptogenesis, neural stem cells, glia). Knowledge of the most important model systems for neuro-developmental biology. Basic insights into the evolution of neural development. In-depth knowledge of the most important experimental approaches in neuro-developmental biology.</p> <p>Core skills: Conception of experiments to answer scientific questions using modern methods.</p>		<p>Workload:</p> <p>Attendance time: 50 h</p> <p>Self-study time: 130 h</p>
Course: Development and Evolution of the Nervous system (Lecture)		2 WLH
Course: Exercises and consolidation of lecture 'Development and Evolution of the Nervous system' (tutorial)		1 WLH
Course: Conception of experiments with modern methods (Seminar)		1 WLH
<p>Examination: Written examination (90 minutes)</p> <p>Examination prerequisites: Presentation and discussion of self-developed experimental approaches</p>		6 C
<p>Examination requirements:</p> <p>Knowledge of the neural development of vertebrates and invertebrates.</p> <p>Knowledge of different model systems and their respective strengths and disadvantages.</p> <p>Knowledge of modern methods for the analysis of neural development.</p> <p>Applying this knowledge to new scientific questions (for example, designing experiments and discussing possible outcomes).</p>		
<p>Admission requirements: can't be combined with M.Bio.322 or M.Bio.395</p>	<p>Recommended previous knowledge:</p> <p>Basics in developmental biology (e.g. module M.Bio.321 or respective textbook chapters)</p> <p>Basics of vertebrate neural development (e.g. module M.Bio 359 or respective textbook chapters)</p>	
<p>Language: English</p>	<p>Person responsible for module: Prof. Gregor Bucher</p>	
<p>Course frequency: each summer semester</p>	<p>Duration: 1 semester[s]</p>	
<p>Number of repeat examinations permitted: twice</p>	<p>Recommended semester:</p>	
Maximum number of students:		

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Georg-August-Universität Göttingen		3 C
Module M.Bio.395: Frontiers in Neural Development		3 WLH
Learning outcome, core skills: In-depth knowledge of neural development of insects. In-depth knowledge of principles and mechanisms of neural development of vertebrates and insects (among others: regionalization of the neuroectoderm, axon guidance, synaptogenesis, neural stem cells, glia). Knowledge of the most important model systems for neuro-developmental biology. Basic insights into the evolution of neural development. In-depth knowledge of the most important experimental approaches in neuro-developmental biology.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: Development and Evolution of the Nervous system (Lecture) can't be combined with M.Bio.322 or M.Bio.392		2 WLH
Course: Exercises and consolidation of lecture 'Development and Evolution of the Nervous system' (tutorial)		1 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: Knowledge of the neural development of vertebrates and invertebrates. Knowledge of different model systems and their respective strengths and disadvantages. Knowledge of modern methods for the analysis of neural development.		
Admission requirements: can't be combined with M.Bio.322 or M.Bio.394	Recommended previous knowledge: Basics in developmental biology (e.g. module M.Bio.321 or respective textbook chapters) Basics of vertebrate neural development (e.g. module M.Bio 359 or respective textbook chapters)	
Language: English	Person responsible for module: Prof. Gregor Bucher	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 5		

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Biodiv.402: Plant ecology and ecosystems research		
Learning outcome, core skills: The students <ul style="list-style-type: none"> • acquire an overview of the most important habitats all over the world and their respective vegetation and ecology • acquire a global overview of the anthropogenous causes of ecosystem burdens • acquire profound knowledge of the habitats of exemplarily selected climate zones and their ecology • know basic correlations between climate, soil and vegetation on different continents • acquire profound knowledge on how the global change of land use and the global warming influence vegetation and ecosystem processes • are able to analyze topics of ecosystematic and global aspects of plant ecology independently and prepare a presentation of their findings 		Workload: Attendance time: 56 h Self-study time: 124 h
Course: M.Biodiv.402.1: Vegetation & ecology of the world (Lecture) or		2 WLH
Course: M.Biodiv.402.8: Ecosystems research, carbon balance & global warming (Lecture)		
Course: M.Biodiv.402.4: Current topics in plant ecology and nature conservation (Seminar) or		2 WLH
Course: M.Biodiv.402.6: Aut- and synecology of plants: the tropics (Seminar) ■		
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Examination: Written examination (90 minutes) Examination prerequisites: Oral presentation (max. 25 minutes) Examination requirements: Knowledge of ecosystematic and global aspects of plant ecology and possible impacts of the climate change on terrestrial ecosystems. Knowledge of the change in land use and its impacts on the structure of species in the different vegetation areas of the earth.		6 C
Examination requirements: Understanding of the ecosystem and global perspectives of plant ecology and of consequences of climate change on ecosystems. Comprehension of the effects of land use change on species composition in the different vegetation zones of the earth.		
Admission requirements:	Recommended previous knowledge: none	

Language: English, German	Person responsible for module: Prof. Dr. Christoph Leuschner
Course frequency: each winter semester; [REDACTED] [REDACTED]	Duration: 1 - 2 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: not limited	

Maximum number of students:	
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Georg-August-Universität Göttingen		6 C
Module M.Biodiv.404: Animal ecology		4 WLH
<p>Learning outcome, core skills:</p> <p>The lecture presents principles and theories of ecology and introduces current topics of ecological research. Topics include population ecology, interactions in animal communities, food webs, biodiversity and ecological theories.</p> <p>The seminar covers current topics of ecological and evolutionary research. In the seminar the students acquire advanced knowledge of methods and strategies to analyze ecological communities.</p> <p>Knowledge of ecological theories and modelling. Principles of animal populations and food webs. Experimental and statistical methods for the analysis of animal communities. Knowledge of current topics of animal ecological and evolutionary biology research.</p>		<p>Workload:</p> <p>Attendance time: 56 h</p> <p>Self-study time: 124 h</p>
Course: Animal ecology (Lecture)		2 WLH
Course: Topics of animal ecology and evolution (Seminar)		2 WLH
<p>Examination: Written examination (90 minutes)</p> <p>Examination prerequisites:</p> <p>Oral presentation (ca. 20 minutes)</p> <p>Examination requirements:</p> <p>Knowledge of ecological principles and theories, population models. Functional responses, analysis and modelling of biotic interactions and food webs. Biodiversity and ecosystem functioning.</p>		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Stefan Scheu	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: not limited		

Georg-August-Universität Göttingen Module M.Biodiv.406: Regional vegetation ecology and phytodiversity	6 C 4 WLH
Learning outcome, core skills: The students acquire an improved level of understanding plant diversity and vegetation on various spatial and temporal scales. Subject-specific literature and other basic and applied data sources are evaluated. The academic and administrative background of the EU Habitats Directive is highlighted as well as its implementation in biodiversity conservation and its achievements in the conservation of natural and semi-natural habitats on national and international level. The students review and present current research in vegetation ecology and how this information is handled in academic journals. They learn problem-oriented perception of concepts such as ecoregions and biomes, land use and nature conservation from a vegetation ecologist's perspective. They acquire skills in understanding, evaluating, appreciating and questioning scientific publications, receive performance instructions, gain insight in the conception and scientific capacity of biodiversity-related instruments in conservation administration and policy.	Workload: Attendance time: 56 h Self-study time: 124 h
Course: M.Biodiv.406-1: Habitat types of the EU Habitats Directive (Lecture)	2 WLH
Course: M.Biodiv.403-3: Applied vegetation ecology of the Mediterranean (Seminar) or	2 WLH
Course: M.Biodiv.403-4 Modern issues of vegetation science in agricultural landscapes (Seminar) ■	
■ ■	
Examination: Lecture (approx. 30 minutes) Examination requirements: Proven knowledge of plant diversity and vegetation on various spatial and temporal scales; in-depth skills in applied geobotany and/or biogeography; profound knowledge in present-day strategies for the conservatin of habitat types and ecoregions on national and international level.	6 C
Admission requirements: none	Recommended previous knowledge: none
Language: English, German	Person responsible for module: Prof. Dr. Erwin Bergmeier
Course frequency: each winter semester; ■ ■	Duration: 1 - 2 semester[s]
Number of repeat examinations permitted:	Recommended semester:

twice	
Maximum number of students: 16	
Additional notes and regulations: The seminars in modules M.Biodiv.403 and M.Biodiv.406 are mutually exclusive.	

Georg-August-Universität Göttingen		6 C
Module M.Biodiv.408: Primate ecology		8 WLH
Learning outcome, core skills: Learning outcome: Get to know ecological principles and methods with non-human primates as model organisms. Core skills: Design and realization of ecological studies; critical inspection and evaluation of relevant literature; competent handling of damageable equipment (telemetry).		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Primate ecology (Lecture)		2 WLH
Course: Primate ecology (Exercise)		6 WLH
Examination: Written examination (90 minutes) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Ecological knowledge, especially concerning primates and their interactions with the environment; knowledge of ecological studies on primates; scientific presentation of results.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Eckhard W. Heymann	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Biodiv.412: Nature conservation biology		
Learning outcome, core skills: The module imparts the basic knowledge necessary to complete the advanced modules in Nature Conservation. Detailed knowledge is provided on the development of Conservation Biology as a scientific field (M.Biodiv.412-2), on current questions in Nature Conservation (M.Biodiv.412-1, 412-3) and on Conservation Politics (M.Forst.1212.2, M.Forst.1512). Professional skills at the interface between conservation research, the development of conservation strategies and their realization under socio-political conditions. Knowledge of political decision-making under scientific and economical operation guidelines.		Workload: Attendance time: 56 h Self-study time: 124 h
Course: One lecture from the following options: <ul style="list-style-type: none"> • M.Biodiv.412-1 International nature conservation <i>or</i> • M.Biodiv.412-2 The song of the Dodo - Origins of conservation biology <i>or</i> • M.Forst.1212.2 Analysis of policy for nature conservation 		2 WLH
Course: One seminar from the following options: <ul style="list-style-type: none"> • M.Biodiv.412-3 Botanical nature conservation and environmental protection <i>or</i> • M.Forst.1512 Global environmental and forest policy 		2 WLH
Examination: Written examination (90 minutes) Examination prerequisites: Oral presentation (max. 30 minutes) Examination requirements: Knowledge from the scientific fields which form the basis of Conservation Biology, its history, Conservation Politics on a national and international scale and the political dimensions of Nature Conservation.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. rer. nat. Matthias Waltert	
Course frequency: each winter semester; 412-3 each summer semester	Duration: 1 - 2 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: not limited		

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Biodiv.415: Evolution: Evolutionary biology		
<p>Learning outcome, core skills:</p> <p>The lecture "Evolutionary Biology" introduces the basics of the different elements of the theory of evolution, the mechanisms of evolution as well as the methods of evolutionary biology. The lecture is given by docents from the departments participating in the module "Evolutionary Biology". Therefore the lecture also provides insight into the working areas and research interests of the individual departments.</p> <p>The lecture "Phylogenetic Systematics" introduces the basics of the theory and methods of cladistics beginning with a historical insight into the biological classification approaches prior to Hennig. To this, adequate case examples are presented and contradictory hypotheses on the phylogeny of individual taxa are discussed.</p> <p>The lecture "Phylogeography" considers the relation between biogeography, population biology and ecology and the phylogeny of primates. Biogeographical aspects (adaptive radiations, isolations etc.) as codeterminants for the origin of species are highlighted.</p> <p>Acquisition of an overview of the mechanisms underlying the evolution of organisms and of the current state of knowledge of the origin of the biological diversity on earth.</p>		<p>Workload:</p> <p>Attendance time: 56 h</p> <p>Self-study time: 124 h</p>
<p>Course: M.Biodiv.415.1: Evolutionary biology (Lecture)</p> <p>You have to attend the lecture M.Biodiv.415.1 and one lecture of the following two:</p> <p><i>Course frequency: each winter semester</i></p>		2 WLH
<p>Course: M.Biodiv.415.3: Phylogeography (Lecture)</p> <p><i>Course frequency: each summer semester</i></p>		2 WLH
<p>Examination: Written examination (90 minutes)</p> <p>Examination requirements:</p> <p>Knowledge of the theory of evolution, the principles and mechanisms of evolution as well as of the methods of botanical and zoological evolutionary biological research.</p>		6 C
<p>Admission requirements:</p> <p>none</p>	<p>Recommended previous knowledge:</p> <p>Basics in phylogenetic systematics are expected.</p>	
<p>Language:</p> <p>German</p>	<p>Person responsible for module:</p> <p>Prof. Dr. Thomas Friedl</p>	
<p>Course frequency:</p> <p>each winter semester: 415.1, 415.2; each summer semester: 415.3</p>	<p>Duration:</p> <p>2 semester[s]</p>	
<p>Number of repeat examinations permitted:</p> <p>twice</p>	<p>Recommended semester:</p>	
<p>Maximum number of students:</p> <p>not limited</p>		

Georg-August-Universität Göttingen		6 C 7 WLH
Module M.Biodiv.419: Pro- and eucaryotic algae: Algae and lichens		
Learning outcome, core skills: The students have deepened knowledge of the diversity of eukaryotic algae and cyanobacteria as well as an overview of the structure and function of lichen symbiosis. They know the groups of organisms involved in lichen symbiosis as well as important morphological and anatomical characteristics of lichens, algae and cyanobacteria and they are able to identify selected mid-European foliose lichen through their shape. The students have basic knowledge of the gas, water and mineral metabolism of lichens as well as basic knowledge of the diversity and function of the secondary metabolites produced by lichens (lichen substances). They acquire knowledge of habitat ecology, of the endangerment of lichens and of the indicators of air quality through lichens. The students have practical experience with the microscopic study of freshwater algae from different types of waters. They have an overview of current topics of phycology and are able to present a current topic from the literature.		Workload: Attendance time: 98 h Self-study time: 82 h
Course: M.Biodiv.419-1 Biology of lichens (Lecture)		2 WLH
Course: M.Biodiv.419-2 Current topics in phykology (Seminar)		1 WLH
Course: M.Biodiv.419-3 Algae and lichens of the pre-Alps area (Excursion)		4 WLH
Examination: Written examination (60 minutes) Examination prerequisites: Oral presentation (max. 25 minutes) Examination requirements: Knowledge of the structure of lichen symbiosis and its ecology; overview of the diversity of foliose lichen and their role as an indicator for air quality: functions of lichen substances; endangerment of lichen biodiversity.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Thomas Friedl	
Course frequency: each winter semester 419-1, 419-2; each summer semester 419-3	Duration: 2 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.421: Plant ecology: Project course plant ecology		
<p>Learning outcome, core skills: This module is meant for students who plan to write their master thesis on an ecological or vegetation scientific field. It is the aim of the module to impart the basics of scientific working, presenting and publishing in ecology. The module introduces to crucial aspects of experimental design, statistical analysis and graphical presentation of results as well as to the oral and written presentation of these results.</p> <p>The students acquire skills for scientific work in the field of plant ecology from the beginning of data analysis until the drafting of a scientific publication in English. Additionally, the oral presentation in English is practiced through presentation of a scientific paper.</p>		<p>Workload: Attendance time: 112 h Self-study time: 68 h</p>
Course: Basics of the design, realization and interpretation of ecological research projects and basics of writing scientific publications (Lecture)		1 WLH
Course: Scientific analysis and publication of plant ecological project data (Exercise)		7 WLH
<p>Examination: Oral Presentation written report in form of a scientific manuscript based on project data (max. 15 pages) Examination requirements: Knowledge of the essential aspects of scientific working in plant ecology from the experimental design to a publication.</p>		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Dr. Dietrich Hertel	
Course frequency: each winter semester; Block course	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen Module M.Biodiv.422: Plant ecology: Carbondioxide and water balance of trees	6 C 8 WLH
Learning outcome, core skills: The students <ul style="list-style-type: none"> • have deepened knowledge of the theoretical basis of the gas exchange and water balance of plants and how these processes depend on the environment • have theoretical and practical knowledge of modern measuring techniques used in the field of tree ecophysiology • have deepened knowledge of how global warming affects the ecophysiology of trees • are able to measure the photosynthetic capacity, leaf conductance, xylem sap flux, leaf water status and the microclimate of old and young trees outdoors • have practical experiences in conducting ecophysiological and microclimatic measurements on the Göttingen Canopy Walkway within the new botanical garden • can differentiate functional types of various tree species • are able to present the results of measurements on the carbon and water balance of plants in accordance with scientific standards in written and oral form 	Workload: Attendance time: 112 h Self-study time: 68 h
Course: Carbondioxide and water balance of trees (Lecture)	2 WLH
Course: Photosynthesis, respiration und transpiration (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 10 pages) Examination prerequisites: Oral presentation (max. 25 minutes) Examination requirements: Knowledge of the ecophysiology of trees with focus on carbon and water balance. Basics of the gas exchange of plants, especially photosynthesis and respiration. Knowledge of transpiration and the role of plants in the "soil-plant-atmosphere" continuum. Knowledge of xylem sap flux, leaf conductance and the driving abiotic climatic and edaphic variables.	6 C
Admission requirements: none	Recommended previous knowledge: none
Language: English, German	Person responsible for module: Prof. Dr. Christoph Leuschner
Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 12	

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.423: Plant ecology: Study of habitats		
Learning outcome, core skills: The students <ul style="list-style-type: none"> • learn the most important theoretical and methodical basics of the modern plant ecological study of habitat. Focus lies on European beech forest communities which are ecologically most important in Central Europe • get an overview of the scientific vegetation classification of beech forests and get to know important abiotic habitat factors such as microclimate and morphological and chemical soil characteristics • learn different techniques for the assessment of vegetation composition and for the analysis of various habitat factors using the example of beech forests of different habitats. Several parameters for the ecological characterization of soil conditions (e.g. morphological characterization of different soil horizons, determination of soil type) as well as various microclimate factors will be analyzed and related with the respective vegetation • get to know modern lab methods (ion emission spectrometry (ICP), gas chromatography, etc.) for the physicochemical analysis of soil samples (pH value, carbon and nitrogen contents, concentration of plant available cations). • get to know techniques for the electronic data analysis and subsequent scientific interpretation and presentation. The protocol covers a partial topic of the course. Core skills: scientific plant ecological field work and in the lab including written and oral presentation of results.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Plant ecology: study of habitats (Lecture)		2 WLH
Course: Habitat ecology of various forest societies in the surroundings of Goettingen (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: Oral presentation (ca. 15 Min.) Examination requirements: Theoretical and methodical knowledge of modern plant ecological study of habitats with focus on beech forests in Central Europe. Scientific vegetation classification of beech forests as well as characterization of microclimatic, soil morphological and chemical properties.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Dr. Dietrich Hertel	
Course frequency:	Duration:	

each summer semester	1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 20	

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Biodiv.425: Evolution of embryophyta		
Learning outcome, core skills: The students get to know the current state of research in the field of the organismic evolution of embryophyta through study, presentation and discussion of latest case studies concerning speciation, history of evolution, chromosomal and genomic evolution, reproduction biology, evolution of traits and coevolution. They get an overview of novel theoretical and methodical research approaches to the comprehension of plant evolution. They acquire the ability to develop evolutionary hypotheses and are able to choose appropriate model systems and methods for their validation. The students acquire practical skills in presentation, interpretation and discussion of results (in scientific English). They are able to describe and understand evolutionary processes, hypotheses and methods and to give examples for case studies on terrestrial plants. They can discuss scientific results in English.		Workload: Attendance time: 56 h Self-study time: 124 h
Course: Speciation and evolution of land plants (Lecture) <i>Course frequency: each winter semester</i>		2 WLH
Course: Plant systematics and phycology (Seminar) <i>Course frequency: each semester</i>		2 WLH
Examination: Oral examination about the contents of the lecture (approx. 15 minutes) Examination prerequisites: participation in the seminar and oral presentation (45 minutes) Examination requirements: In the oral examination the students demonstrate their ability to understand and discuss evolutionary processes and hypotheses as well as their knowledge of case studies on terrestrial plants. In the seminar the students shall give talks in scientific English and present research results – preferably those of their master thesis.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Elvira Hörandl	
Course frequency: lecture: each winter semester, seminar: each semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 30		

Georg-August-Universität Göttingen Module M.Biodiv.426: Reproduction and evolution of flowering plants	6 C 4 WLH
Learning outcome, core skills: The students acquire intimate knowledge of the reproduction strategies and the developmental biology of flowering plants. They acquire a broad comprehension of the relevance of reproduction biology for the evolution and ecology of plants, for general evolutionary biological problems (e.g. the paradox of sex) as well as for applications in plant breeding. Specific method skills for active research are acquired through experimental work, karyological and embryological analyses (experimental work, microscopic observation, seed flow cytometry) and statistical analyses. The students are able to answer questions concerning reproduction and developmental biology of plants and evolutionary biological hypotheses and know practical applications. They are able to plan, conduct and present scientific studies in the field of reproduction biology of plants.	Workload: Attendance time: 56 h Self-study time: 124 h
Course: Reproduction and evolution biology of flowering plants (Exercise)	3 WLH
Course: Reproduction strategies of flowering plants (Lecture)	1 WLH
Examination: Oral examination about the lecture contents (approx. 15 minutes) Examination prerequisites: Protocol (max. 12 pages) Examination requirements: In the oral examination the students demonstrate their competences in reproduction and developmental biology of flowering plants, in evolutionary biological hypotheses and in practical applications. The protocol of the practical shows their skills to plan, conduct and present a scientific study in the field of reproduction biology of plants.	6 C
Admission requirements: none	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Dr. Elvira Hörandl
Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 12	

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.430: Vegetation history: Project study in palaeoecology and palynology		
Learning outcome, core skills: Consolidation of pollen analytical or dendroecological/dendrochronological working methods, independent identification and documentation of pollen and spore types, preparation, presentation and analysis of palaeoecological data, use of software, induction into current palaeoecological topics. Independent problem and research oriented pollen analytical studies as part of a small research project in the field of vegetation history, dendroecology/dendrochronology or climate and environmental history as well as scientific examination of palaeoecological topics; written and oral presentation of results.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Current topics in palynology and climate dynamics (Seminar)		2 WLH
Course: Palaeoecology and palynology (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 10 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Knowledge of pollen and spore types; pollen analytical and dendrochronological working methods. Basics of dendrochronology and dendroecology and basics of the reconstruction of climate events in the Quaternary period based on pollen diagrams and dendrochronological series.		6 C
Admission requirements: Palynology/vegetation history/dendrochronology and/or pollen analytical exercises or an equivalent course.	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Hermann Behling	
Course frequency: once a year	Duration: 2 semester[s]	
Number of repeat examinations permitted: once	Recommended semester:	
Maximum number of students: 10		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.431: Vegetation ecology: Applied vegetation ecology and multivariate analysis		
Learning outcome, core skills: Problem oriented project management, practicing methods of data collection and multivariate data analysis in vegetation ecology, vegetation sampling in grasslands, determination of plants even in their vegetative state, induction into current topics on the diversity and dynamics of grassland ecosystems. Gaining experience in the identification of vegetative and generative grassland plants, analysis and interpretation of multivariate data sets, ability to use software for the input and processing of vegetation ecological data and for ordination, studying in small groups and individually, preparation and presentation of posters, written presentation of scientific problems and results.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Lecture "Basics and methods of data collection and multivariate data analysis in vegetation ecology" (Lecture)		2 WLH
Course: Exercise "Grassland vegetation and multivariate vegetation analysis"		6 WLH
Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: Poster presentation		6 C
Examination requirements: Knowledge of vegetation ecological data collection and multivariate data analysis. Assessment and classification of grassland vegetation . Knowledge of current vegetation ecological topics on the diversity and dynamics of grassland ecosystems. Presentation of results in the form of a scientific publication.		
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Erwin Bergmeier	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.437: Vegetation history: Methods in palaeoecology		
<p>Learning outcome, core skills: The students learn various palaeoecological methods: analysis of annual rings, charcoal, algae, diatoms, ostracods, dinoflagellates, non-pollen palynomorphs (NPPs), amoebae, sediment parameters etc.. They acquire knowledge of different palaeoecological parameters regarding environment, vegetation, climate and human settlement history and their evaluation in the context of the global change research. They learn presentation and analysis methods and how to use modern software. The students get to know the broadness of possible applications using examples from current palaeoecological topics.</p> <p>Skills for the assessment of applications of palaeoecological analyses during environmental, vegetation and climate historical as well as archaeological studies. Independent realization of small problem and research oriented palaeoecological studies in the field of environmental, vegetation or climate history. Scientific examination of palaeoecological topics from global change research, presentation of results.</p>		<p>Workload: Attendance time: 112 h Self-study time: 68 h</p>
Course: Methods in palaeoecology (Lecture)		1 WLH
Course: Methods in palaeoecology (Exercise)		5 WLH
Course: Current research results in palaeoecology and palynology (Seminar)		2 WLH
<p>Examination: Lecture (approx. 20 minutes) Examination requirements: Presentation of results of a practical work.</p>		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Hermann Behling	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 15		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.441: Animal ecology: Evolutionary ecology		
<p>Learning outcome, core skills: The students learn basic techniques for the analysis of phylogenetic relations. Armored mites (Oribatida, Chelicerata) with possible Precambrian origin serve as a model group. Phylogenetic relations and biogeographical distribution patterns are analyzed by means of various molecular markers (18S rDNA, 28S rDNA, elongation factor 1 alpha, cytochrome oxidase I). In addition, the age of various taxa of armored mites is studied. Besides phylogenetic and biogeographical patterns the intraspecific variance of sexual and parthenogenetic species of armored mites which presumably survived for hundreds of millions of years is analyzed. The programs used for the analyses include PAUP*, RAxML, MrBayes, BEAST, Bioedit, Clustal X and Treeview. Basic knowledge of molecular biology and bioinformatics is helpful but not mandatory to attend this course.</p> <p>Core skills: Modern techniques and procedures including statistical analyses for the discovery of phylogenetic relations and biogeographical distribution patterns of animal groups. Knowledge of the intraspecific variance of sexual and parthenogenetic species.</p>		<p>Workload: Attendance time: 112 h Self-study time: 68 h</p>
Course: Evolutionary ecology (Lecture)		2 WLH
Course: Evolutionary ecology - experiments (Exercise)		6 WLH
<p>Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Knowledge of phylogenetic relations and biogeographical distribution patterns of animal groups using the example of armored mites. Phylogenetic dating of animal species and determination of the intraspecific variance of sexual and parthenogenetic species.</p>		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Mark Maraun	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.442: Animal ecology: Synecology of animals		
Learning outcome, core skills: The students learn: <ul style="list-style-type: none"> • the collection and statistical analysis of data for animal communities from different habitats (forests, meadows); selected animal groups (earthworms, spiders, ground beetles, rove beetles, springtails and mites) are classified and counted. Environment and vegetation data are collected for each habitat and the relations between the distribution of species and the environmental conditions are analyzed • the determination of density, biomass and diversity of animal groups using different techniques (soil traps, heat extraction, insect vacuum) • statistical methods (analysis of variance, discriminant analysis and canonical correspondence analysis) for the analysis of the composition of animal communities from different habitats and its relations with environmental factors • the preparation of a scientific publication using the obtained data • the oral presentation of scientific data and perceptions • methods for the assessment of the ground-dwelling and above-ground fauna • knowledge of statistical procedures for the analysis of animal communities • analysis of control quantities of animal communities (abiotic and biotic factors) • knowledge of the nutritive organization of animal communities 		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Synecology of Animals (Lecture)		2 WLH
Course: Synecology of Animals - Experiments (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: Oral presentation (ca. 15 min.) Examination requirements: Knowledge of indigenous animal communities of forests and meadows (especially arthropods, clitellates, insects etc. that live at or in the ground) and their ecological requirements in the respective biotopes. Methods for the quantification of animal communities and their dependence on environmental parameters.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Mark Maraun	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.445: Animal ecology: Molecular analysis of trophic interactions in soil food webs		
Learning outcome, core skills: The students learn: <ul style="list-style-type: none"> • Techniques for the molecular analysis of trophic interactions in soil food webs. The prey spectra of ground-dwelling arthropods (collembolans, mites) from forests are determined by using PCR based gut content analysis with specific DNA markers. • Design and realization of laboratory feeding experiments. • Methods of field sampling of soil animals, DNA extraction, PCR, gel electrophoresis, capillary electrophoresis, lipid analysis. • Statistical analysis with R. Core skills: Theoretical and practical knowledge on the structure of food webs and trophic interactions. Structure of soil animal communities.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Molecular analysis of trophic interactions in soil food webs - experiments (Exercise)		6 WLH
Course: Molecular analysis of trophic interactions in soil food webs (Lecture)		2 WLH
Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Protocol		6 C
Admission requirements: none	Recommended previous knowledge: Basic knowledge in molecular biology	
Language: English, German	Person responsible for module: Prof. Dr. Stefan Scheu	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: once	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C
Module M.Biodiv.446: Molecular zoology and insect-biotechnology		8 WLH
<p>Learning outcome, core skills:</p> <p>The module addresses students who want to acquire profound theoretical and practical knowledge of molecular genetic approaches. Relevant methods and experimental design are imparted theoretically and practically. Selected topics of molecular zoology are profoundly covered in the lectures based current publications. Current molecular approaches in pest control and insect biotechnology are covered as well.</p> <p>Learning outcome:</p> <ul style="list-style-type: none"> • Application of various molecular biological techniques, experimental strategies and interpretation of data • Gene function analysis in Zoology: How are relevant genes identified and how is their function studied in model and non-model organisms? (e.g. genetic screens, reverse genetics (RNAi), genome editing (CRISPR/Cas9), transgenesis) • Knowledge of databases of DNA, protein and gene function • Identification of orthologous genes in different species • Establishment of new molecular genetic model systems for zoological questions • Advanced discussion of current research topics in molecular zoology • Advanced discussion of most recent approaches in insect biotechnology using molecular genetic methods (i.a. pest control). <p>Core skills:</p> <p>The students should be able to</p> <ul style="list-style-type: none"> • Design strategies for the identification and analysis of gene functions in non-model organisms • Design the establishment of new molecular genetic model systems • Present and assess scientific problems concerning selected topics of molecular Zoology. 		<p>Workload:</p> <p>Attendance time: 112 h</p> <p>Self-study time: 68 h</p>
<p>Course: Molekulare Zoologie und Insekten-Biotechnologie (Lecture)</p> <p><i>Contents:</i> molecular genetic methods; gene fuction analysis; selected topics from molecular zoology; most recent developments in insect biotechnology</p>		2 WLH
<p>Course: Topics of molecular zoology and insect biotechnology (Seminar)</p>		2 WLH
<p>Course: Molecular zoology and insect biotechnology (Exercise)</p>		4 WLH
Examination: Oral Presentation (approx. 15 minutes)		6 C
<p>Examination requirements:</p> <p>The students should be able to apply the contents and methods listed as “core skills” to new questions.</p>		
<p>Admission requirements:</p> <p>none</p>	<p>Recommended previous knowledge:</p> <p>none</p>	

Language: English	Person responsible for module: Prof. Dr. Ernst A. Wimmer Prof. Dr. Gregor Bucher
Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 20	

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.450: Plant ecology: Impact of global climate change on plant communities and their functional traits		
Learning outcome, core skills: The students <ul style="list-style-type: none"> • have profound knowledge of interactions between plants • have an overview of completion research • understand the concept of “functional traits” of species and communities • are able to analyze the reaction of plants to the main factors of global climate change experimentally • have profound knowledge of the design and statistical (variance analytical) analysis of ecological experiments • are able to present the results of ecological experiments in accordance with scientific standards in written and oral form. 		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Impact of global climate change on plant communities (Lecture)		2 WLH
Course: Impact of global climate change on plant communities (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 10 pages) Examination prerequisites: Oral presentation (max. 25 minutes) Examination requirements: Knowledge of plant interactions and of the concept of “functional traits”. Knowledge of experimental methods and statistical procedures in botanical (population) ecology. Knowledge of strategies for the adaption of plants to climate change.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Christoph Leuschner Dr. Ina Meier	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen Module M.Biodiv.480: Nature conservation biology: Nature conservation inventories	6 C 8 WLH
<p>Learning outcome, core skills:</p> <p>A valid, objective and reliable provision of data for preparing and making decisions is indispensable for an adaptive management in nature conservation. Strategic and operational nature conservation design, the realization of nature conservation measures as well as the controlling in nature conservation depend crucially on the quality of the available data.</p> <p>Introductory, the students learn various inventory procedures used in practical nature conservation, use them to collect data in a small model area and evaluate the methods concerning the validity, objectivity and reliability of the results of their inventory.</p> <p>Subsequently, the students get to know inventory procedures with lower risk and less error from the design over the realization to the processing and analysis of data using the same model area. The available data pool comprises time series from a multi-year monitoring that the students complement for specific areas and time points.</p> <p>The lecture covers both the theoretical background and approaches and examples for nature conservation inventories on different spatial and content-related levels.</p> <p>Learning objective of the module are the development</p> <ul style="list-style-type: none"> • of skills for the critical analysis and evaluation of data stocks and inventory methods in nature conservation • of skills to plan, realize and analyze goal-oriented and statistically validated nature conservation inventories • of skills to use geographic information systems, databanks and statistics during nature conservation inventories • of skills to map habitats and species (use of remote sensing, GPS, laser rangefinder and other equipment as well as selected methods such as plot sampling, plotless sampling and distance sampling) <p>The module shall impart skills to</p> <ul style="list-style-type: none"> • understand, structure and realize planning-related processes • systematically question and critically evaluate information that serves as the basis for decision-making in the light of the projected outcome • develop and realize objective, reliable and valid study and inventory designs • deposit, manage and statistically process obtained information in spread sheets, databanks and geographical information systems • apply statistical procedures – especially from the non-parametric section – in inventory design and data analysis 	<p>Workload:</p> <p>Attendance time: 112 h</p> <p>Self-study time: 68 h</p>
Course: Nature conservation inventories (Lecture)	2 WLH
Course: Nature conservation inventories (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages)	6 C

<p>Examination prerequisites: Oral presentation (ca. 15 minutes)</p> <p>Examination requirements: Strategic and operational nature conservation design, realization of nature conservation measures and controlling. Knowledge concerning the evaluation of data stocks and inventory methods in nature conservation. Knowledge of GIS, databanks and statistics for nature conservation inventories.</p>	
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<p>Admission requirements: none</p>	<p>Recommended previous knowledge: none</p>
<p>Language: English, German</p>	<p>Person responsible for module: Dr. rer. nat. Hermann Hondong</p>
<p>Course frequency: each semester</p>	<p>Duration: 1 semester[s]</p>
<p>Number of repeat examinations permitted: twice</p>	<p>Recommended semester:</p>
<p>Maximum number of students: 7</p>	

<p>Additional notes and regulations: Course in summer semester: in German; max.12 students; course in winter semester (together with MINC): in English, max. 7 students</p>
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Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.481: Nature conservation biology: Population biology in nature conservation		
Learning outcome, core skills: Study of the methodology of an endangerment analysis (population viability analysis, PVA) of an animal species (case study partridge). The students determine causes of endangerment and develop options for the nature conservation in the cultural landscape. The students transfer empirically collected own data and data from the literature to a population model and develop a modeling of an endangered animal population. Core skills: collection and analysis of field data; use of population models; development of management options for an endangered animal species; knowledge of the telemetry as an important method for the registration of movement patterns of vertebrates.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Population viability analysis (Lecture)		2 WLH
Course: Population viability analysis (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Knowledge of the potential endangerment of specific animal species and measures for their protection in the cultural landscape. Modeling of endangered animal populations.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Dr. rer. nat. Eckhard Gottschalk	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.483: Nature conservation biology: Assessment of wildlife species for nature conservation		
Learning outcome, core skills: Monitoring populations of endangered species is an essential component of adaptive conservation management. With completion of this course students should be able to design surveys which allow accurate and reliable population estimations. In the course of the module the theoretical basis for quantitative assessments are imparted and practical experiences on design and realization of wildlife surveys are presented. In the tutorial part of the course population data are being analyzed and interpreted. An understanding of concepts such as effective strip width, cluster size, encounter rate and detection probability as well as the influence of these variables on population estimates and associated variance is being provided.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Theoretical background of population assessment (Lecture)		2 WLH
Course: Analysis, interpretation and management of stand data (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) Examination requirements: Basics of adaptive conservation management and knowledge of the realization of wildlife surveys. Basics on survey design and practice-oriented estimation of wildlife populations.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. rer. nat. Matthias Waltert	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 12		

Georg-August-Universität Göttingen		6 C 8 WLH
Module M.Biodiv.488: Nature conservation biology: Ornithology		
<p>Learning outcome, core skills:</p> <p>The students acquire knowledge concerning the biology and biodiversity of indigenous bird species and their habitats. To these belongs knowledge of habitat conditions, feeding ecology, breeding biology, hibernation, population trends and causes of endangerment.</p> <p>The students learn the optical and acoustic identifications of bird species within the open country by use of selected ornithological methods: telemetry, mapping, analysis of the habitat use of individual species and generation of species profiles. The students acquire skills for the comparison of different landscape elements regarding their avifauna, for the analysis of collected data and for the modeling of the extinction risk of endangered populations.</p> <p>Core skills: knowledge of the biodiversity of the indigenous avifauna and its ecology as well as of field methods for its quantitative registration, statistical analysis and evaluation of the endangerment potential on species and population level.</p>		<p>Workload:</p> <p>Attendance time: 112 h</p> <p>Self-study time: 68 h</p>
Course: Biology of selected bird species (Lecture)		2 WLH
Course: Identification of birds in the field and methods in ornithology (Exercise)		6 WLH
<p>Examination: Minutes / Lab report (max. 20 pages)</p> <p>Examination requirements:</p> <p>Biodiversity of the indigenous avifauna as well as of field methods for its identification and evaluation of the endangerment potential on species and population level.</p>		6 C
<p>Admission requirements:</p> <p>none</p>	<p>Recommended previous knowledge:</p> <p>Knowledge of the songs of the most common bird species.</p>	
<p>Language:</p> <p>English</p>	<p>Person responsible for module:</p> <p>Dr. rer. nat. Eckhard Gottschalk</p>	
<p>Course frequency:</p> <p>each summer semester</p>	<p>Duration:</p> <p>1 semester[s]</p>	
<p>Number of repeat examinations permitted:</p> <p>twice</p>	<p>Recommended semester:</p>	
<p>Maximum number of students:</p> <p>12</p>		

Georg-August-Universität Göttingen		6 C 4 WLH
Module M.Biodiv.491: Next generation sequencing for evolutionary biology		
<p>Learning outcome, core skills:</p> <p>The students acquire knowledge of the various systems and techniques for “next generation sequencing”. The focus of the module lies on the fast developing field of bioinformatics and data analysis. Lab methods are explained and discussed. The students learn the different possible applications for “next generation sequencing” data in evolutionary biology of animals and plants, for example biodiversity, evolution of traits, adaption, phylogeography, population genetics, hybridization, genotyping and QTL (quantitative trait locus) analyses. They get an overview of the theory and gain practical experiences in this new research area. They acquire the competence to choose suitable methods for evolutionary questions and to test hypotheses on non-model organisms.</p> <p>The students are able to list the differences and (dis)advantages of various “next generation sequencing” methods and to select suitable methods to analyze specific evolutionary questions by use of non-model organisms. They are able to compare and analyze the raw data of “next generation sequencing” and to annotate genes of a compared genome or transcriptome.</p> <p>The students shall present and discuss case studies from the field of “next generation sequencing” during the seminar in scientific English.</p>		<p>Workload:</p> <p>Attendance time: 56 h Self-study time: 124 h</p>
Course: M.Biodiv.491-2 Next generation sequencing: examples of botanical and zoological studies (Seminar)		0,5 WLH
Course: M.Biodiv.491-3 Analysis of next generation sequencing data (Exercise)		3 WLH
Course: M.Biodiv.491-1 Next generation sequencing: methods, data analysis and applications (Lecture)		0,5 WLH
<p>Examination: Minutes / Lab report (max. 12 pages)</p> <p>Examination prerequisites: Oral presentation (max. 20 min.)</p> <p>Examination requirements: Knowledge of the various applications of „next generation sequencing“ in evolutionary biology of animals and plants. Overview of the theory and practical experiences in this new research area.</p>		6 C
<p>Admission requirements: none</p>	<p>Recommended previous knowledge: Speciation and evolution of land plants (Lecture: M.Biodiv.425). Basic knowledge about programs that deal with DNA contig assembly and multiple sequence alignment (e.g. Geneious) are advantageous</p>	
<p>Language: English</p>	<p>Person responsible for module: Dr. Marc Appelhans</p>	

Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 12	