



DIRECTORY OF MODULES OFFERED IN ENGLISH LANGUAGE

COURSES OFFERED IN ENGLISH AT THE UNIVERSITY OF GÖTTINGEN
ACADEMIC YEAR 2017/2018

FACULTY OF BIOLOGY AND PSYCHOLOGY



GEORG-AUGUST-UNIVERSITÄT
GÖTTINGEN

A very warm welcome!

The University of Göttingen features an outstanding study environment for both exchange and full-degree students. All courses of study benefit from an excellent research-oriented environment formed by a broad network including five Max Planck Institutes, the German Primate Centre, the German Aerospace Centre and the Academy of Science and Humanities: the Göttingen Campus. An increasing number of lectures and courses are taught in the English language attracting more and more international students. This catalogue provides an impression of what is available.

This catalogue of courses taught in English varies from faculty to faculty and the courses available to you depend on whether you are an exchange student coming to Göttingen for a semester or an academic year, or whether you are a full degree student coming to Göttingen to complete an entire degree programme. You may take most courses in the programme you are enrolled in, however in a few cases restrictions may apply. Selecting courses from other subjects or other departments might require negotiations. If you have any questions, please contact the study advisor in charge of your subject.

Prior to their arrival in Göttingen exchange students have to set up a learning agreement. In some cases restrictions will apply, e.g. signing up for certain laboratory courses may not be possible. Generally exchange students are required to take at least half of the lectures and courses within their chosen subject.

Full degree students must first apply for a study place. Links to websites with application guidelines and deadlines are provided by some subjects/faculties. If not stated otherwise please visit:

<http://www.uni-goettingen.de/en/3811.html>

In any case, you are very welcome to browse through this catalogue to find/check out courses that suit your interests! For the complete course catalogue of the University of Göttingen see:

<https://univz.uni-goettingen.de/qissserver/>

We look forward to welcoming you in Göttingen!

Index by areas of study

I. Faculty of Biology and Psychology

1. Biology

a. Bachelor programmes

The courses/modules available varies depending whether you are degree or exchange student.
All B.Sc. programmes are taught in German.

aa. Degree students

German knowledge of level DSH2 is required.

Information and contact details about the different study programmes can be found here:

<http://www.uni-goettingen.de/de/bachelor--2-fach-bachelor-biologie/122050.html>

bb. Exchange students

German knowledge of level B2 is recommended.

Information and contact details about application procedure and courses available for exchange bachelor students can be found here:

http://biologie.uni-goettingen.de/incoming_en

For courses in German language German knowledge of CEFR level B2 is recommended.

Course admission restrictions may occur depending on your previous knowledge in biology and other natural sciences.

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b. Master programmes

The courses/modules available varies depending whether you are degree or exchange student.
All M.Sc. programmes are taught in English.

aa. Degree students

Proof of proficiency in English (level C1 according to *Common European Framework of Reference for Languages, CEFR*) and German (CEFR level B1) is mandatory at the time point of application.

i. M.Sc. Microbiology and Biochemistry

Information and contact details about application procedure and study programme details can be found here:

<http://www.uni-goettingen.de/en/35341.html>

ii. M.Sc. Development, Neural and Behavioral Biology

Information and contact details about application procedure and study programme details can be found here:

<http://www.uni-goettingen.de/en/38560.html>

iii. M.Sc. Biodiversity, Ecology and Evolution

Information and contact details about application procedure and study programme details can be found here:

<http://www.uni-goettingen.de/en/123968.html>

bb. Exchange students

You can participate in the courses listed below from the different master programmes, however it requires

- previous knowledge in the field of study and
- a language proof (CEFR level C1) at the time point of application.

Information and contact details about application procedure and courses available for exchange master students can be found here:

http://biologie.uni-goettingen.de/incoming_en

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2. Psychology

No courses available, as all study programmes in Psychology are taught in German.

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 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
Module M.Bio.157: Biochemistry and biophysics		3 WLH
Learning outcome, core skills: Molecular biochemistry and biophysics of different classes of biomolecules, plant primary and secondary metabolism, lipid metabolism, lipids as signal molecules and secondary metabolites, biotechnological utilization and modification of storage substances, enzymes of lipid metabolism, modern biophysical methods for analysis of biomolecules Handling of state of the art equipment, critical dealing with current biochemical topics, detailed analysis of experiments and their presentation. Independent acquisition of professional knowledge from publications by active participation in the seminar.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: lecture: Biochemistry and Biophysics (Lecture)		3 WLH
Examination: Written examination (90 minutes)		3 C
Examination requirements: <ul style="list-style-type: none"> • basic knowledge of different classes of biomolecules and their metabolism • knowledge about spectroscopy of molecules • biotechnologic techniques using plants 		
Admission requirements: can't be combined with M.Bio.106	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Ivo Feußner	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 2	
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 summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 10	

Georg-August-Universität Göttingen Module M.Bio.341: Developmental biology of invertebrates (key competence module)	6 C 4 WLH
Learning outcome, core skills: Profound insights into principles of developmental biology and developmental genetics in selected invertebrates. Understanding of methods to identify, analyse and manipulate gene function. Knowledge of important data bases for in silico sequence analysis and model system specific data bases. Basic insights into the evolution of developmental processes. Critical analysis of results, scientific presentation and discussion of data.	Workload: Attendance time: 56 h Self-study time: 124 h
Courses: 1. Development and evolution of invertebrates (Lecture) 2. Development and evolution of invertebrates (Seminar) 3. tutorial: Exercises to the lecture "Development and evolution of invertebrates"	2 WLH 1 WLH 1 WLH
Examination: Written examination (90 minutes) Examination prerequisites: oral presentation (~ 20 min)	6 C
Examination requirements: Profound knowledge of principles in developmental biology and developmental genetics in invertebrates based on the contents of the lecture and the additional teaching material provided by the lecturer. Comprehension of methods used to identify, analyze and manipulate gene functions as well as the analysis of developmental processes. Knowledge of different model systems with their respective pros and cons. Ability to transfer this knowledge to new scientific problems (i.e. suggestions of useful experiments and discussion of possible results).	
Admission requirements: can't be combined with M.Bio.301 or M.Bio.361	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Gregor Bucher Prof. Dr. Ernst Wimmer
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		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		3 C
Module M.Bio.345: Neurobiology 2 (key competence module)		2 WLH
Learning outcome, core skills: Profound knowledge of current concepts in neuroscience		Workload: Attendance time: 28 h Self-study time: 62 h
Course: Current questions and concepts in neurosciences (Lecture)		2 WLH
Examination: Written examination (120 minutes)		3 C
Examination requirements: Profound knowledge in a range of current concepts in neuroscience including detailed knowledge of specific classical and novel topics.		
Admission requirements: can't be combined with core module M.Bio.305	Recommended previous knowledge: M.Bio.304	
Language: English	Person responsible for module: Prof. Dr. Andre Fiala	
Course frequency: each summer 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.347: Behavioral biology (key competence module)		
Learning outcome, core skills: Profound knowledge of the principles of the evolutionary approach in behavioral analyses. Students are able to present and discuss scientific issues in oral and written form. They know how to plan and realize simple projects and experiments from the field of behavioral biology.		Workload: Attendance time: 56 h Self-study time: 124 h
Courses: 1. Behavioral biology (Lecture) 2. Behavioral biology (Seminar)		3 WLH 1 WLH
Examination: Term Paper (max. 10 pages) Examination prerequisites: oral presentation (~ 15 min)		6 C
Examination requirements: Profound knowledge of determinants and mechanisms of behaviour. Ability to use important methods of behavioral biology.		
Admission requirements: M.Bio.306 or M.Bio.346: Introduction to Behavioral Biology can't be combined with core module M.Bio.307 or key competence module M.Bio.367	Recommended previous knowledge: none	
Language: English	Person responsible for module: Dr. Claudia Fichtel	
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 Module M.Bio.348: Human genetics (key competence module)	6 C 4 WLH
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
Courses: 1. Human genetics II (Lecture) 2. Tumor genetics; Reproduction genetics; Stem cells (Seminar) participation in two of the offered seminar series	2 WLH 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)		
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: 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.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: lecture: Development and plasticity of the nervous system (Lecture)		2 WLH
Examination: Oral examination (approx. 15 minutes)		3 C
Examination requirements: Profound knowledge of recent research and understanding of scientific methods in the field of development and plasticity of the nervous system.		
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		3 C 2 WLH
Module M.Bio.360: Development and plasticity of the nervous system (seminar)		
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 Module M.Bio.361: Developmental biology of invertebrates (key competence module)	3 C 2 WLH
Learning outcome, core skills: Profound insights into principles of developmental biology and developmental genetics in selected invertebrates. Basic insights into the evolution of developmental processes.	Workload: Attendance time: 28 h Self-study time: 62 h
Course: Development and evolution of invertebrates (Lecture)	2 WLH
Examination: Written examination (90 minutes)	3 C
Examination requirements: Profound knowledge of principles in developmental biology and developmental genetics in invertebrates based on the contents of the lecture and the additional teaching material provided by the lecturer. Comprehension of methods used to identify, analyze and manipulate gene functions as well as the analysis of developmental processes. Knowledge of different model systems with their respective pros and cons. Ability to transfer this knowledge to new scientific problems (i.e. suggestions of useful experiments and discussion of possible results).	
Admission requirements: can't be combined with M.Bio.301 oder M.Bio.341	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Gregor Bucher Prof. Dr. Ernst Wimmer
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.366: Introduction to behavioral biology (key competence module)		
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
Module M.Bio.367: Behavioral biology (key competence module)		3 WLH
Learning outcome, core skills: Profound knowledge of the principles of the evolutionary approach in behavioral analyses. Students are able to present and discuss scientific issues in written form.		Workload: Attendance time: 42 h Self-study time: 48 h
Course: Behavioral biology (Lecture)		3 WLH
Examination: Term Paper (max. 10 pages)		3 C
Examination requirements: Profound knowledge of determinants and mechanisms of behaviour. Ability to use important methods of behavioral biology.		
Admission requirements: core module M.Bio.306: Introduction to behavioral biology, can't be combined with core module M.Bio.307 or key competence module M.Bio.347	Recommended previous knowledge: none	
Language: English	Person responsible for module: Dr. Claudia Fichtel	
Course frequency: each summer semester	Duration:	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 8		

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	

Language: English, German	Person responsible for module: Prof. Dr. Christoph Leuschner
Course frequency: once a year; jedes WiSe: 402.1; 402.2; 402.4; 402.6; 402.8; jedes SoSe: 402.11	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.403: Vegetation ecology and vegetation history		
Learning outcome, core skills: The students acquire knowledge and a profound understanding of temporal and spatial vegetation patterns; one focus lies on biomes, climate zones and other large-scale vegetation areas, another focus lies on biological and geobotanical principles and basics on different scale levels and in different natural environments. Perception and knowledge in basic and applied fields of advanced vegetation ecology, vegetation history, sociology and chorology of plants, conception and reception of scientific papers; presentation skills.		Workload: Attendance time: 56 h Self-study time: 124 h
Courses: 1. M.Biodiv.402.1 Vegetation and ecology of the world (Lecture) or 2. M.Biodiv.403.1 General and plant sociological vegetation ecology (Lecture) or 3. M.Biodiv.403.2 General vegetation history of the world (Lecture) 4. M.Biodiv.403.3 Applied vegetation ecology in the Mediterranean area (Seminar) or 5. M.Biodiv.403.4 Modern issues of vegetation science in agricultural landscapes (Seminar) or 6. M.Biodiv.402.11 Vegetation and ecology of Eurasian and North American steppes (Seminar)		2 WLH 2 WLH
Examination: Oral presentation (ca. 30 minutes) Examination requirements: Knowledge of temporal and spatial vegetation patterns with focus on biomes, climate zones and other large-scale vegetation areas.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Erwin Bergmeier Prof. Dr. Hermann Behling	
Course frequency: jedes WiSe: 402.1; 403.1; 403.3; jedes SoSe: 402.11; 403.2	Duration: 1 - 2 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 16		

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>
<p>Courses:</p> <p>1. Animal ecology (Lecture)</p> <p>2. Topics of animal ecology and evolution (Seminar)</p>		<p>2 WLH</p> <p>2 WLH</p>
<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
<p>Admission requirements:</p> <p>none</p>	<p>Recommended previous knowledge:</p> <p>none</p>	
<p>Language:</p> <p>English, German</p>	<p>Person responsible for module:</p> <p>Prof. Dr. Stefan Scheu</p>	
<p>Course frequency:</p> <p>each winter 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>not limited</p>		

Georg-August-Universität Göttingen Module M.Biodiv.408: Primate ecology		6 C 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
Courses: 1. Primate ecology (Lecture) 2. Primate ecology (Exercise)		2 WLH 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
Module M.Biodiv.415: Evolution: Evolutionary biology		4 WLH
<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>Courses:</p> <p>1. 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>2. M.Biodiv.415.2: Phylogenetic systematics (Lecture)</p> <p>3. M.Biodiv.415.3: Phylogeography (Lecture)</p>		<p>2 WLH</p> <p>2 WLH</p>
<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>jedes WiSe: 415.1; 415.2 jedes SoSe: 415.3</p>	<p>Duration:</p> <p>1 oder 2</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 4 WLH
Module M.Biodiv.418: Pro- and eucaryotic algae: Evolution and systematics		
Learning outcome, core skills: Knowledge of the diversity of eukaryotic algae and cyanobacteria. Knowledge of current concepts of the evolution of eukaryotes and the diversity and origin of plastids; overview of possible applications of this knowledge in biotechnology and ecology. Core skills: <ul style="list-style-type: none"> • Understanding to classify the characteristics of cyanobacteria and photoautotrophic eukaryotes in an evolutionary context; • understanding of current developments in the economic use of cyanobacteria and eukaryotic algae; • overview of modern methods of analysis in biodiversity research such as DNA barcodes and reconstructions of phylogeny. 		Workload: Attendance time: 56 h Self-study time: 124 h
Courses: 1. M.Biodiv.418.1: Phylogeny and systematics of plants and algae: biology und phylogeny of algae		2 WLH
2. M.Biodiv.418.2: Plant Systematics: Phycology (Seminar)		2 WLH
Examination: Written examination (90 minutes) Examination prerequisites: Oral presentation (ca. 20 minutes)		6 C
Examination requirements: Knowledge of the biodiversity of eukaryotic algae and cyanobacteria; current concepts of the evolution of eukaryotes and the origin of plastids; knowledge of applications of pro- and eukaryotic algae in biotechnology.		
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Prof. Dr. Thomas Friedl	
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		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
Courses: 1. M.Biodiv.419-1 Biology of lichens (Lecture) 2. M.Biodiv.419-2 Current topics in phykology (Seminar) 3. M.Biodiv.419-3 Algae and lichens of the pre-Alps area (Excursion)		2 WLH 1 WLH 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: jedes WiSe 419-1, 419-2; jedes SoSe 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		
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. 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.		Workload: Attendance time: 112 h Self-study time: 68 h
Courses: 1. Basics of the design, realization and interpretation of ecological research projects and basics of writing scientific publications (Lecture) 2. Scientific analysis and publication of plant ecological project data (Exercise)		1 WLH 7 WLH
Examination: Oral Presentation, mit schriftlicher Ausarbeitung in Form eines wissenschaftlichen Artikels basierend auf Projektdaten (max. 15 pages) Examination requirements: Knowledge of the essential aspects of scientific working in plant ecology from the experimental design to a publication.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Dr. Dietrich Hertel	
Course frequency: each winter semester; Blockveranstaltung	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
Courses: 1. Carbondioxide and water balance of trees (Lecture) 2. Photosynthesis, respiration und transpiration (Exercise)	2 WLH 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
Courses: 1. Plant ecology: study of habitats (Lecture)		2 WLH
2. 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: 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
Module M.Biodiv.425: Evolution of embryophyta		4 WLH
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
Courses: 1. Speciation and evolution of land plants (Lecture) <i>Course frequency: jedes Wintersemester</i> 2. Plant systematics and phycology (Seminar) <i>Course frequency: jedes Semester</i>		2 WLH 2 WLH
Examination: Oral examination, zum Stoff der Vorlesung (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: V: jedes Wintersemester, S: jedes 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
Courses: 1. Reproduction and evolution biology of flowering plants (Exercise) 2. Reproduction strategies of flowering plants (Lecture)	3 WLH 1 WLH
Examination: Oral examination, zum Stoff der Vorlesung (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 4 WLH
Module M.Biodiv.427: Molecular evolution of embryophyta		
Learning outcome, core skills: The students acquire a profound comprehension of the population genetics and molecular evolution of flowering plants. They acquire theoretical and practical knowledge of the application of molecular markers in plant systematics on the level of populations and species. They learn the specific lab techniques for the detection of both dominant and codominant molecular markers (Amplified Fragment Length Polymorphisms, microsatellites) and get to know the methodological proceedings in the primer design for non-model organisms. The students are able to gather and analyze molecular datasets of non-model organisms for land plants. The results are interpreted in the context of a specific evolutionary process and can be presented in a written protocol as well as in a talk. The students acquire skills in special methods and computer programs for data evaluation and interpretation (e.g. population genetic statistics, network analyses, offspring arrays).		Workload: Attendance time: 56 h Self-study time: 124 h
Courses: 1. DNA fingerprint techniques for terrestrial plants (Exercise) 2. Introduction to molecular markers (Lecture)		3 WLH 1 WLH
Examination: Oral presentation (ca. 15 minutes) und protocol (max. 12 pages) Examination prerequisites: Attendance of the lecture Examination requirements: In the protocol the students demonstrate their abilities in the acquisition and analysis of DNA fingerprint datasets of non-model organisms in land plants. They shall interpret their results in the context of specific evolutionary processes and give an oral presentation.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English	Person responsible for module: Dr. Diego Hojsgaard	
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.430: Vegetation history: Project study in palaeoecology and palynology	6 C 8 WLH
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
Courses: 1. Current topics in palynology and climate dynamics (Seminar) 2. Palaeoecology and palynology (Exercise)	2 WLH 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
Courses: 1. Lecture "Basics and methods of data collection and multivariate data analysis in vegetation ecology" (Lecture)		2 WLH
2. 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		
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. 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.		Workload: Attendance time: 112 h Self-study time: 68 h
Courses: 1. Methods in palaeoecology (Lecture) 2. Methods in palaeoecology (Exercise) 3. Current research results in palaeoecology and palynology (Seminar)		1 WLH 5 WLH 2 WLH
Examination: Lecture (approx. 20 minutes) Examination requirements: Presentation of results of a practical work.		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>
<p>Courses: 1. Evolutionary ecology (Lecture) 2. Evolutionary ecology - experiments (Exercise)</p>		2 WLH 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
<p>Admission requirements: none</p>	<p>Recommended previous knowledge: none</p>	
<p>Language: English</p>	<p>Person responsible for module: Prof. Dr. Mark Maraun</p>	
<p>Course frequency: each winter 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: 12</p>		

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
Courses: 1. Synecology of Animals (Lecture) 2. Synecology of Animals - Experiments (Exercise)		2 WLH 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
Courses: 1. Molecular analysis of trophic interactions in soil food webs - experiments (Exercise)		6 WLH
2. 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: Dr. rer. nat. Olaf Butenschön 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 Module M.Biodiv.446: Molecular zoology and insect-biotechnology	6 C 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>Courses:</p> <p>1. 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> <p>2. Topics of molecular zoology and insect biotechnology (Seminar)</p> <p>3. Molecular zoology and insect biotechnology (Exercise)</p>	<p>2 WLH</p> <p>2 WLH</p> <p>4 WLH</p>
<p>Examination: Written examination (60 minutes)</p> <p>Examination prerequisites: Regular participation in the seminar and oral presentation</p>	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>	

Admission requirements: none	Recommended previous knowledge: none
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
Courses: 1. Impact of global climate change on plant communities (Lecture) 2. Impact of global climate change on plant communities (Exercise)		2 WLH 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>
<p>Courses:</p> <p>1. Nature conservation inventories (Lecture)</p> <p>2. Nature conservation inventories (Exercise)</p>	<p>2 WLH</p> <p>6 WLH</p>

Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: Oral presentation (ca. 15 minutes) 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.		6 C
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: Dr. rer. nat. Hermann Hondong	
Course frequency: each semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester:	
Maximum number of students: 7		
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		

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
Courses: 1. Population viability analysis (Lecture) 2. Population viability analysis (Exercise)		2 WLH 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
Courses:		
1. Theoretical background of population assessment (Lecture)		2 WLH
2. Analysis, interpretation and management of stand data (Exercise)		6 WLH
Examination: Minutes / Lab report (max. 20 pages)		6 C
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.		
Admission requirements: none	Recommended previous knowledge: none	
Language: English, German	Person responsible for module: PD 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>
<p>Courses:</p> <p>1. Biology of selected bird species (Lecture)</p> <p>2. Identification of birds in the field and methods in ornithology (Exercise)</p>		<p>2 WLH</p> <p>6 WLH</p>
<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 Module M.Biodiv.491: Next generation sequencing for evolutionary biology	6 C 4 WLH
<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</p> <p>Self-study time: 124 h</p>
<p>Courses:</p> <p>1. M.Biodiv.491-2 Next generation sequencing: examples of botanical and zoological studies (Seminar)</p> <p>2. M.Biodiv.491-3 Analysis of next generation sequencing data (Exercise)</p> <p>3. M.Biodiv.491-1 Next generation sequencing: methods, data analysis and applications (Lecture)</p>	<p>0,5 WLH</p> <p>3 WLH</p> <p>0,5 WLH</p>
<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	

Georg-August-Universität Göttingen		3 C
Module SK.Bio-NF.7001: Neurobiology		2 WLH
<p>Learning outcome, core skills:</p> <p>The students should acquire comprehension in form and function of neurons and their anatomical and physiological features (genetics, subcellular organization, resting membrane potential, action potential generation, stimulus conduction, transmitter release, ion channels, receptors, second messenger cascades, axonal transport). The students acquire knowledge of the physiological basics of sensory systems (olfactory, gustatory, acoustic, mechanosensory and visual perception) as well as motor control. Based on this the students educe understanding for the relation between neuronal circuits and simple modes of behavior (central pattern generators, reflexes, and taxis movements). The students should conceptually learn how neuronal connections are modified by experience (cellular mechanisms of learning and memory) and should learn different types of modification of behavior based on experience and neuronal substrates. The students should acquire fundamental insight into the organization and function of brains and autonomous nervous systems of mammals and invertebrates. The neurobiological basis of behavioral control (orientation, communication, circadian rhythm and sleep as well as motivation and metabolism) is explained. The students will learn physiological and cellular mechanisms of aging and of neurodegenerative diseases.</p>		<p>Workload:</p> <p>Attendance time: 30 h</p> <p>Self-study time: 60 h</p>
Course: Neurobiology (Lecture)		2 WLH
Examination: Written examination (90 minutes)		3 C
<p>Examination requirements:</p> <p>The students should have the ability to assess coherence and facts of statements from the field of neurobiology; they should be able to answer questions on the structure and function of neurons and neuronal circuits. Furthermore they should be able to describe and compare neuronal basics of behavioral control, their experience-dependent modification and conceptual mechanisms of complex behavior; they should be able to describe and compare physiological mechanisms of sensory perception and different sensory modalities; they should be able to describe physiological and cellular mechanisms of aging and of neurodegenerative diseases.</p>		
Admission requirements: none	Recommended previous knowledge: Basic knowledge in Biology	
Language: English	Person responsible for module: Prof. Dr. Andre Fiala	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 4 - 6	
Maximum number of students: 30		

Georg-August-Universität Göttingen		6 C
Module SK.Bio.7001: Neurobiology		4 WLH
Learning outcome, core skills: The students should acquire comprehension in form and function of neurons and their anatomical and physiological features (genetics, subcellular organization, resting membrane potential, action potential generation, stimulus conduction, transmitter release, ion channels, receptors, second messenger cascades, axonal transport). The students acquire knowledge of the physiological basics of sensory systems (olfactory, gustatory, acoustic, mechanosensory and visual perception) as well as motor control. Based on this the students educe understanding for the relation between neuronal circuits and simple modes of behavior (central pattern generators, reflexes, and taxis movements). The students should conceptually learn how neuronal connections are modified by experience (cellular mechanisms of learning and memory) and should learn different types of modification of behavior based on experience and neuronal substrates. The students should acquire fundamental insight into the organization and function of brains and autonomous nervous systems of mammals and invertebrates. The neurobiological basis of behavioral control (orientation, communication, circadian rhythm and sleep as well as motivation and metabolism) is explained. The students will learn physiological and cellular mechanisms of aging and of neurodegenerative diseases.		Workload: Attendance time: 30 h Self-study time: 150 h
Courses: 1. Neurobiology (Lecture) 2. Neurobiology (Seminar)		2 WLH 2 WLH
Examination: Written examination (90 minutes) Examination prerequisites: regular seminar participation and oral presentation (not graded)		6 C
Examination requirements: The students should have the ability to assess coherence and facts of statements from the field of neurobiology; they should be able to answer questions on the structure and function of neurons and neuronal circuits. Furthermore they should be able to describe and compare neuronal basics of behavioral control, their experience-dependent modification and conceptual mechanisms of complex behavior; they should be able to describe and compare physiological mechanisms of sensory perception and different sensory modalities; they should be able to describe physiological and cellular mechanisms of aging and of neurodegenerative diseases.		
Admission requirements: none	Recommended previous knowledge: Basic knowledge in Biology	
Language: English	Person responsible for module: Prof. Dr. Andre Fiala	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted:	Recommended semester:	

twice	4 - 6
Maximum number of students: 30	

Georg-August-Universität Göttingen		3 C
Module SK.Bio.7002: Basic virology		2 WLH
Learning outcome, core skills: The students will become familiar with the architecture of viruses and will learn how these agents replicate and evade the immune response of the host. Moreover, it will be discussed how viruses cause disease and how this process can be prevented by antivirals and vaccines. The lectures will focus on important human pathogens, including HIV, influenza and herpesviruses. Upon successful completion of the module, the students will be able to classify viruses and will have an understanding of central mechanisms underlying virus replication and pathogenesis and their inhibition by therapy and vaccination.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: Basic Virology (Lecture)		2 WLH
Examination: Written examination (45 minutes)		3 C
Examination requirements: The students must assess whether statements regarding basic aspects of virology, including virus classification, viral replication, virus-host interactions, pathogenesis, immune evasion and antiviral therapy and vaccination, are correct.		
Admission requirements: none	Recommended previous knowledge: Basic knowledge in Biology	
Language: English	Person responsible for module: Prof. Dr. Stefan Pöhlmann	
Course frequency: each semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 3 - 6	
Maximum number of students: 30		

Georg-August-Universität Göttingen		3 C 2 WLH
Module SK.Bio.7003: Isolation and characterization of fungal contaminations from food or other sources		
Learning outcome, core skills: The students deepen their present laboratory praxis by analyzing mold contaminations on food or other sources using recent methods of genetics and molecular cell biology. After passing the module the students can independently plan and perform experiments, document primary data, investigate the literature, and know how unknown mold fungi can be indentified.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: Isolation and characterization of fungal contaminations from food or other sources (Internship)		2 WLH
Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: Regular participation in the practical course		3 C
Examination requirements: In the report the students should describe from which food or source they have isolated and characterized which mold fungus and which methods were used for characterization. They should describe reproducibly the experiments performed by means of performance, description of the results with illustrations and conclusion. With the help of literature research they should discuss their results. The report should be written in English.		
Admission requirements: B.Bio.129	Recommended previous knowledge: B.Bio.118	
Language: English	Person responsible for module: Dr. rer. nat. Britta Herzog	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6	
Maximum number of students: 10		

Georg-August-Universität Göttingen		3 C 2 WLH
Module SK.Bio.7004: Environmental microbiology		
Learning outcome, core skills: The students will acquire a comprehensive understanding of basic microbial processes in the environment. Students will learn how microorganisms are effective in biogeochemical cycles and how these cycles evolved in Earth's history and shaped our biosphere. They will gain knowledge about important microbial habitats (terrestrial/aquatic/extreme), and their microbial diversity. They will be introduced in the application of microorganisms in bioremediation and environmental biotechnology.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: Environmental microbiology (Lecture)		2 WLH
Examination: Oral Presentation (approx. 5 minutes)		3 C
Examination requirements: Revising a specific topic in environmental microbiology, compilation of data and preparation/short presentation of a scientific poster.		
Admission requirements: B.Bio.118	Recommended previous knowledge: none	
Language: English	Person responsible for module: Prof. Dr. Rolf Daniel PD Dr. Michael Hoppert	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6	
Maximum number of students: 25		

Georg-August-Universität Göttingen Module SK.Bio.7005: Methods for the identification of protein-protein interactions	3 C 2 WLH
Learning outcome, core skills: The students obtain basic knowledge of the identification of protein-protein interactions. In small groups and in different departments of the Institute of Microbiology and Genetics, they learn the application of selected methods that they present to their fellow students in a concluding seminar at the end of the course. Through the successful participation in the course the students get an overview on different methods for the identification of protein-protein interactions and improve their English communication skills in the lab and in seminars.	Workload: Attendance time: 28 h Self-study time: 62 h
Course: Practical course in the participating groups of the Institute of Microbiology and Genetics	2 WLH
Examination: Oral Presentation (approx. 15 minutes) Examination prerequisites: Regular participation in the practical course	3 C
Examination requirements: The students should present and discuss the applied method for the identification of protein-protein interactions (e.g. immunoprecipitation, affinity chromatography, bimolecular fluorescence complementation, immunoelectron microscopy) in English.	
Admission requirements: Successful participation in <u>one</u> of the following biological basic modules: B.Bio.129 Genetics and microbial cell biology B.Bio.118 Microbiology B.Bio.112 Biochemistry	Recommended previous knowledge: none
Language: English	Person responsible for module: Dr. rer. nat. Oliver Valerius
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6
Maximum number of students: 12	

Georg-August-Universität Göttingen		3 C
Module SK.Bio.7007: Methods in molecular virology		2 WLH
Learning outcome, core skills: The students are introduced to the repertoire of methods used in virological research and diagnostics. The course focuses on current developments and seminal experiments from the past. The students will train their ability to extract scientific methods from the literature by themselves and to devise their own strategies to tackle a scientific problem. Each seminar unit the students have the opportunity to develop their own strategies to solve a specific problem and to discuss their strategies with their fellow students. The students are encouraged to come up with as many alternative approaches as possible. The students' solutions are then compared to published techniques, which are presented in the form of a short talk by a student or the teacher.		Workload: Attendance time: 28 h Self-study time: 62 h
Course: Methods in molecular virology (Seminar)		2 WLH
Examination: Lecture (approx. 30 minutes), not graded Examination prerequisites: Regular participation in the seminar		3 C
Examination requirements: Understanding and scientific presentation of methods in molecular virology in a seminar talk (approx. 20 minutes) with subsequent discussion (approx. 10 minutes).		
Admission requirements: none	Recommended previous knowledge: basic knowledge in virology (e.g. SK.Bio.7002), basic knowledge in molecular biology	
Language: English	Person responsible for module: Dr. Alexander Hahn	
Course frequency: each semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 4 - 6	
Maximum number of students: 15		