Georg-August-Universität
Göttingen

Directory of Modules

This is a translation of the directory of modules as promulgated in Official Bulletin II No. 11, p. 6678, dated August 05, 2020.
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Modules

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Index by areas of study

I. Bachelor's degree programme "Biology"

To successfully complete the Bachelor's degree programme, a total of 180 C must be earned.

1. Core studies

Modules with a total of 130 C have to be successfully completed.

a. First part - compulsory modules

The following modules with a total of 50 C have to be successfully completed.

aa. Orientation modules

bb. Non-biological compulsory modules

b. Second part

From the following modules eight mandatory modules with a total of 80 C must be successfully completed. For that either 20 or 30 C from the non-biological modules and 60 or 50 C from the biological basic modules must be completed.

aa. Non-biological basic modules (20 or 30 ECTS)

(If module B.Inf.1801 is chosen, module B.Inf.1802 has to be completed additionally and vice versa; both modules are counted as one basic module for the purpose of the regulations. If module B.Phy-NF.7002 is chosen, module B.Phy-NF.7004 has to be completed additionally and vice versa; both modules are counted as one basic module for the purpose of the regulations.

If module B.Che.1201 is chosen, module B.Che.7409 has to be completed additionally and vice versa; both modules are counted as one basic module for the purpose of the regulations.)

bb. Biological basic modules (60 or 50 ECTS)

2. Professionalisation

A total of 38 C have to be earned according to the following regulations.

a. Scientific consolidation

The scientific consolidation conduces for scientific profiling. The scientific consolidation has a block structure and lasts a total of 8 weeks.The compulsory module B.Bio.190 for 6 C and one of the consolidation courses (elective courses) for 12 C must be successfully completed.

b. Scientific profiling

The following two compulsory modules with a total of 9 C have to be successfully completed.

c. Key competencies

Modules with a total of at least 11 C must be successfully completed, whereby the modules can be selected from the cross-faculty key competencies modules, the study offers of the Central Institute for Languages and Transferable Skills (ZESS) and the following elective modules, as long as they are not chosen in the core studies.

3. Bachelor's thesis

The successful submission of the bachelor thesis is worth 12 C. The bachelor thesis is performed in 10 weeks full time.

4. Specializations

In the Bachelor's degree programme "Biology" one of the following specializations can be completed. In this case, under the regulations of No. 1 (b) as well as No. 2, the modules must be successfully completed according to the following regulations.

a. Specialization "Bioinformatics"

aa. Non-biological basic modules

The following modules with a total of 20 C have to be successfully completed.

bb. Biological basic modules

The following modules with a total of 30 C have to be successfully completed.

cc. Consolidation course

The following module with a total of 12 C has to be successfully completed.

b. Specialization "Molecular biosciences"

aa. Non-biological basic modules

The following two modules with a total of 10 C have to be successfully completed.

bb. Biological basic modules

Four of the following modules with a total of 40 C have to be successfully completed.

cc. Consolidation course

One of the following modules with 12 C has to be successfully completed.

c. Specialization "Behavioural biology and neurobiology"

aa. Non-biological basic modules

The following two modules with a total of 10 C have to be successfully completed.

bb. Biological basic modules

Four of the following modules with a total of 40 C have to be successfully completed.

cc. Consolidation course

One of the following modules with 12 C has to be successfully completed.

II. Ergänzende Hinweise zu Modulprüfungen

Soweit in diesem Modulverzeichnis Modulbeschreibungen in englischer Sprache veröffentlicht werden, gilt für die verwendeten Prüfungsformen nachfolgende Zuordnung:

written examination - Klausur

minutes / lab report / written report - schriftlicher Bericht

oral presentation / lecture - Präsentation

Georg-August-Universität Göttingen **Module B.Bio-NF.111: Anthropology**	6 C 4 WLH

Learning outcome, core skills: The students gain insight into the evolution of humans and their primate relatives in respect of their physical configuration, their behavior and molecular systems, as well as the co-evolution of biological and cultural features and comforts. The students learn to identify and analyze biological content in anthropological questions and referencing of cultural, ecological and behavioral batteries of questions. The students get an overview over the main fields in biological anthropology, epistemological basics and derivation in anthropology and learn subject-specific methodology of phylogeny, historical anthropology, behavioral biology of primates, molecular anthropology, human ecology and human ethology.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Introduction to Anthropology (Human Biology) (Lecture)	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Mechanisms of evolution; speciation and phylogeny; evolution of humans; differentiation of populations; life-history strategies; biology, ecology and phylogenetic history of primates; evolution of social systems; evolution of human behavior; strategies of human reproduction; palaeodemography; palaeopathology; palaeoepidemiology; social structures of human societies; patterns of marriage and migration; human ecology.	

Admission requirements: 2-F-BA: at least 20 C from the orientation modules	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Julia Ostner
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 20	

Additional notes and regulations:
The combination of this module with module B.Bio.111 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.112: Biochemistry**	6 C 4 WLH

Learning outcome, core skills: Students acquire basic knowledge of biochemical substances and an overview over elementary principles of biochemical reactions and learn the application of biochemical methods. They get insight into the basics of protein chemistry and genetics: DNA, RNA, enzymes, carbohydrates, lipids and cell membranes; basics of metabolism and signal transduction.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Grundlagen der Biochemie (Lecture)	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Basic knowledge of biochemical reactions and its components as well as biochemical methods. Anabolism and catabolism of amino acids, carbohydrates, lipids and nucleic acids; synthesis and function of macromolecules; generation and accumulation of metabolic energy.	

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Dr. rer. nat. Ellen Hornung
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 20	

Additional notes and regulations:
The combination of this module with module B.Bio.112 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.116: General developmental and cell biology**	6 C 4 WLH

Learning outcome, core skills: The students learn about developmental aspects in cell biology; fundamental topics in developmental biology of animals and plants; classic and molecular-biological methods in developmental biology and model organisms.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Allgemeine Entwicklungs- und Zellbiologie (Lecture)	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Students should be able to assess validity of statements, answer random control questions and describe and compare fundamental aspects from the fields: structure and compartments of cells, cytoskeleton, mitochondria, membrane structure and transport, contact and communication between cells, cell cycle, cell division, apoptosis, control of gene expression in eukaryotes, mechanisms in development, germ cells and fertilization, cleavage, principles in pattern formation, morphogenesis, gastrulation, neurulation, genesis of organs, cellular movement and shaping, methods from experimental embryology and developmental genetics, model organisms, formation of axis, genes for segmentation, homeotic selection genes, evolutionary developmental biology, neuronal development, stem cells and regeneration, homeostasis, origination of cancer, embryogenesis of plants, dormancy and germination, light dependent development, phytohormones, evolution and genetics during flower formation.	6 C

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**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:** 3 - 5
Maximum number of students: 25	

Additional notes and regulations:
The combination of this module with module B.Bio.116 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.117: Genome analysis - lecture and seminar**	6 C 4 WLH

Learning outcome, core skills: The students will learn basic methods of genome analysis. After successful participation at this module, they have a basic knowledge in the field of genome sequencing, function and structure of genomes and algorithms for bioinformatical genome analysis.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Grundlagen der Bioinformatik (Lecture, Exercise)	4 WLH

Examination: Oral examination (approx. 30 minutes) **Examination requirements:** Basic methods of genome analysis, in particular genome assembly, sequence alignment and basic algorithms for phylogenetic tree reconstruction based on genome sequences.	6 C

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** For the module we assume basic programming skills (e.g. from the LINUX/PERL course, SK.Bio.114-1) or other programming courses.
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 6
Maximum number of students: 14	

Additional notes and regulations:
The combination of this module with module B.Bio.117 or SK.Bio.117 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.118: Microbiology**	6 C 4 WLH

Learning outcome, core skills: Students acquire fundamental knowledge in systematics, cell biology, growth and reproduction, variety of metabolisms and the ecological, medical and biotechnological relevance of microorganisms. After passing the module, the students have the ability to differentiate microorganisms and know important biotechnological processes and mechanisms pathogens use to attack their hosts.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Allgemeine Mikrobiologie (Lecture)	4 WLH
Examination: Written examination (120 minutes) **Examination requirements:** In the examination, basics in microbiology are addressed concerning the systematic classification, various metabolic pathways, cell biology, the relevance of microorganisms to the industry, the environment and medicine and their application in these fields. The students should be able to assess current events related to microbiology.	6 C

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 15	

Additional notes and regulations:
The combination of this module with module B.Bio.118 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.123: Animal physiology**	6 C 4 WLH

Learning outcome, core skills: The students acquire comprehension for structure and function of nerve cells, glia cells, sensory cells and sensory organs; also comprehension for the principles of central processing of sensory information. They gain insight into the function of hormone systems and different vegetative functions like respiration, energy balance, digestion and excretion. The students gain insight into the complex interaction of physiological performances of the nervous, sensory and vegetative systems and thereby learn to appraise physiological reactions of animals. They learn to assess the relevance of single physiological performances for the whole organism and to better understand its adaptability to existing environmental conditions.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Tierphysiologie (Lecture)	4 WLH
Examination: Written examination (120 minutes) **Examination requirements:** The students should be able to validate statements on animal physiological facts and relationships in the fields neuro-, sensory and vegetative physiology; they should be able to answer random questions on function of sensory cells, neurons and organs regarding physiological aspects; they should have the ability to correctly describe and compare basics and the activity of physiological processes.	6 C

Admission requirements: 2-F-BA: at least 20 C from the orientation modules	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** apl. Prof. Dr. Andreas Stumpner Prof. Dr. Andre Fiala
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 25	

Additional notes and regulations:
The combination of this module with module B.Bio.123 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.125: Cell and molecular biology of plants**	6 C 4 WLH

Learning outcome, core skills: The students gain insight into the characteristics of plant cells, learn to know the relation between structure and function of organelles and the cell wall and get an overview of transport processes and intracellular signal transduction. They learn to know the model plant Arabidopsis thaliana and acquire knowledge in biosynthesis, signal transduction, effects of phytohormones and the molecular methods for adaption of plants to different abiotic and biotic stress factors. The students get an overview of current facts of phylogeny and biotechnology of algae.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Zell- und Molekularbiologie der Pflanze (Lecture)	4 WLH
Examination: Written examination (75 minutes) **Examination requirements:** Arabidopsis thaliana as model organism for research on cell- and molecular processes; methods for research on cell- and molecular processes; mechanisms of protein transport in different cell organelles and into the cell wall; mechanisms of signal transduction in plants; mechanisms of plant immunity.	

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Christiane Gatz
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 15	

Additional notes and regulations:
The combination of this module with module B.Bio.125 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.126: Ecology of animals and plants**	6 C 3 WLH

Learning outcome, core skills: After passing the module the students have knowledge in the following fields and have the ability to interrelate these to each other: Basics in plant and animal ecology; ecophysiology of higher and lower plants; aut- and synecology; ecosystem research and ecology of soil systems.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Ökologie (Lecture)	3 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Abiotic environmental conditions; biotic interactions; coevolution; the relevance of the factor “resource”; ecological niche; population models; regulation of populations; relation of populations; competitors; predation; herbivory; mutualism; symbiosis; ecosystems; succession; diversity and disruption; nutrition networks; definition of an individual; Genet- Ramet concept; r-K-concept; case study “Global Change”.	6 C

Admission requirements: 2-F-BA: at least 20 C from the orientation modules	**Recommended previous knowledge:** Basic kowledge in Biology
Language: 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:** 3 - 5
Maximum number of students: 15	

Additional notes and regulations:
The combination of this module with module B.Bio.126 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.127: Evolution and systematics of plants**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students acquire basic knowledge in evolution, phylogenetic history, systematics and ecology of terrestrial plants (focus on flowering plants). They learn about the spectrum of methods for the reconstruction of the evolution of land plants in time and location and methods for the systematical classification and denotation.	Attendance time: 56 h Self-study time: 124 h

Course: Evolution und Systematik der Pflanzen (Lecture)	4 WLH
Examination: Written examination (60 minutes) **Examination requirements:** In the written examination, the students should be able to validate statements on the evolution and systematics of terrestrial plants and the spectrum of methods for reconstruction of evolution. They should have the ability to answer questions on these topics and also on basics in taxonomy and nomenclature.	6 C

Admission requirements:	**Recommended previous knowledge:**
2-F-BA: at least 20 C from the orientation modules	Basic knowledge in Biology
Language:	**Person responsible for module:**
German	Prof. Dr. Elvira Hörandl
Course frequency:	**Duration:**
each summer semester	1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**
twice	4 - 6
Maximum number of students:	
15	

Additional notes and regulations:
The combination of this module with module B.Bio.127 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.128: Evolution and systematics of animals**	6 C 5 WLH

Learning outcome, core skills: The students acquire the ability to comprehend basic concepts and the way of thinking of the ecological, evolution biological and systematic research. The students learn to know the abundance of structures and phylogenetic relations in selected groups of animals.	**Workload:** Attendance time: 70 h Self-study time: 110 h

Course: Phylogenetisches System und Evolution der Tiere (Lecture)	5 WLH
Examination: Written examination (60 minutes) **Examination requirements:** Phylogeny and evolution of animals; basics in biological systematics (morphological and molecular methods); abundance of structures and phylogenetic relations of selected groups of animals; knowledge in systematics and biology of animal taxa; skills in systematic classification of animals in particular from indigenous biocoenoses.	6 C

Admission requirements: 2-F-BA: at least 20 C from the orientation modules	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Christoph Bleidorn
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 15	

Additional notes and regulations:
The combination of this module with module B.Bio.128 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.129: Genetics and microbial cell biology**	6 C 4 WLH

Learning outcome, core skills: The students gain basic knowledge of classic and molecular genetics and cell biology as well as an overview of genetic, molecular and cellular biological methods and model organisms. They get an insight into inheritance of genetic information and the complex regulation of gene expression, After passing the module they should have the ability to understand how the development and morphology of single and multicellular organisms are regulated by genes and how genes influence the structure and function of cells.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Genetik und mikrobielle Zellbiologie (Lecture)	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** The students should be able to answer random questions from the fields of genetic and cell biology and to validate statements on genetic and cellular biological facts and relations. The basis for these abilities is the content of the lecture and the answering of a catalog of questions with the help of the accompanying tutorials. For the genetics prat, the lecture is based on the book Watson, 6th Edition, Molecular Biology of the Gene (Pearson) and for the cell biology part on selected chapters from the book Alberts et al., 5th Edition, Molecular Biology of the Cell (Garland Science).	6 C

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Gerhard Braus
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 15	

Additional notes and regulations:
The combination of this module with module B.Bio.129 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.130: Cognitive psychology**	3 C 2 WLH

Learning outcome, core skills: During the lectures, students get an introduction to Cognitive Psychology. They acquire solid knowledge about key concepts of this research area and relevant research methods. Students learn the fundamental principles of experimental work in this field, focusing on traditional theories and established paradigms as well as on psychophysiological methods.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Kognitionspsychologie (Lecture)	2 WLH

Examination: Written examination (45 minutes)	3 C

Examination requirements: The students should master the basics in Cognitive Psychology as taught in the lecture. They should be able to understand and describe connections between acquisition of cognitive skills, behavioral patterns, and psychophysiological correlates of (higher) cognitive functions, and to apply this knowledge to new situations.	

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Annekathrin Schacht
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 3
Maximum number of students: 25	

Additional notes and regulations: The combination of this module with module B.Bio.130 is not possible.

Georg-August-Universität Göttingen **Module B.Bio-NF.131: Behavioural biology**	6 C 4 WLH

Learning outcome, core skills: The lecture will convey a comprehensive overview of fundamental topics and approaches in the study of animal behavior. The following topics will be discussed in detail and illustrated with examples from current research: basic functions and behavior, orientation in time and space, habitat and food choice, predation, evolutionary bases of sexual selection, intrasexual selection, intersexual selection, parental care, development and control of behavior, evolution of social systems.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Einführung in die Verhaltensbiologie (Lecture)	4 WLH

Examination: Written examination (120 minutes)	6 C

Examination requirements: basic functions and behavior, orientation in time and space, habitat and food choice, predation, evolutionary bases of sexual selection, intrasexual selection, intersexual selection, parental care, development and control of behavior, evolution of social systems.	

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Peter M. Kappeler
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 4
Maximum number of students: 25	

Additional notes and regulations:
The combination of this module with module B.Bio.131 is not possible.

Georg-August-Universität Göttingen **Module B.Bio.102: Lecture series biology II**	8 C 6 WLH

Learning outcome, core skills: The students get an insight into the fields of Biology to assure a common basic level of knowledge for constitutive modules. They acquire basic knowledge of biochemistry, genetics, bioinformatics, developmental biology, microbiology and plant physiology.	**Workload:** Attendance time: 84 h Self-study time: 156 h

Course: Biologische Ringvorlesung	6 WLH

Examination: Written examination (90 minutes) **Examination requirements:** Basic knowledge in the fields Developmental Biology, Microbiology and Plant Physiology. This comprises concepts in Developmental Biology and the established model organisms in this field; diversity, importance and organization of microorganisms, growth and reproduction, types of microbial metabolism; basics in Plant physiology like photosynthesis, water transport, plant hormones and plant reproduction.	

Examination: Written examination (90 minutes) **Examination requirements:** Basic knowledge in the fields Biochemistry, Genetics and Bioinformatics. This comprises chemical structures of carbohydrates, proteins, fats, as well as basic knowledge in the central metabolic pathways like glycolysis, citric acid cycle and redox reactions, respiratory chain, degradation of proteins, the urea cycle, digestive enzymes, the structure of DNA and RNA, transcription and translation, principles in inheritance and gene regulation for pro- and eucaryotes; basics in Bioinformatics regarding algorithms for alignments and reconstruction of phylogenetic trees.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Stefanie Pöggeler
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 2
Maximum number of students: 240	

Georg-August-Universität Göttingen **Module B.Bio.103: Basic practical course botany**	6 C 5 WLH

Learning outcome, core skills: After passing this module the students should have a basic knowledge in the structure and evolution of plants (algae, mosses, fern and spermatophytae) and fungi as well as insights into the morphology and anatomy of higher plants and a general overview about the plant kingdom. Students learn to prepare, analyze, interpret and illustrate light-optical microscopic probes of plant cells, tissues and organs.	**Workload:** Attendance time: 70 h Self-study time: 110 h

Course: Einführung in die Pflanzenanatomie (Lecture)	2 WLH
Course: Botanisch-Mikroskopische Übungen, Teil I und II (Internship)	3 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Basic knowledge in the fields systematics and evolution of plants and fungi. Morphological and anatomical knowledge in particular on Tracheaophyta.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. nat. Ladislav Hodac
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 1
Maximum number of students: 240	

Georg-August-Universität Göttingen **Module B.Bio.104: Basic practical course zoology**	6 C 5,5 WLH

Learning outcome, core skills: After passing the module the students should have insights into the fields biodiversity, phylogeny and evolution of animals as well as basic knowledge in morphology, ontogenesis, evolutionary ecology and phylogenetic systematics. The students acquire skills in preparation, observation, analysis, interpretation and scientific illustration of zoological preparations, and learn to establish and discuss scientific hypotheses.	**Workload:** Attendance time: 70 h Self-study time: 110 h

Course: Zoologisches Anfängerpraktikum (Lecture)	2 WLH
Course: Zoologisches Anfängerpraktikum (Internship)	3 WLH
Course: Zoologisches Anfängerpraktikum (Seminar)	0,5 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Morphology, anatomy, general biology, phylogeny and evolution of Protista, Porifera, Cnidaria, Plathelminthes, Nemathelminthes, Mollusca, Annelida, Chelicerata, Crustacea, Insecta, Echinodermata, Acrania, Vertebrata (Actinopterygii, Amphibia, Squamata, Chelonia, Crocodylia, Aves, Mammalia)	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. nat. Christian Fischer
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 1 - 2
Maximum number of students: 120	

Georg-August-Universität Göttingen **Module B.Bio.105: Lecture series biology I - part A (general biology, zoology)**	5 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students acquire basic knowledge in different fields of Biology to assure a common basic level of knowledge for constitutive modules. The students learn basics in general biology (in particular evolution and phylogenetics), systematics of animals (overview of zoological biodiversity) and animal physiology (incl. physiological methods).	Attendance time: 56 h Self-study time: 94 h

Course: Biologische Ringvorlesung	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** The students should be able to verify statements on facts and connections from the fields of general biology, animal systematics and animal physiology. They should be able to answer questions on definition, function and relevance of evolutional, phylogenetic and animal physiological processes and methods in note form as well as to describe and compare these processes and methods.	5 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Martin Göpfert
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 1
Maximum number of students: 240	

Georg-August-Universität Göttingen **Module B.Bio.106: Lecture series biology I - part B (anthropology, ecology and cell biology)**	5 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students acquire basic knowledge in different fields of biology (biochemistry, cell biology, anthropology, ecology, behavior). After passing the module the students have the ability to understand location, structure and function of organizational layers of living organisms as well as the basics of interorganismic dependencies and functions in the interaction with the environment in an evolutionary context.	Attendance time: 56 h Self-study time: 94 h

Course: Biologische Ringvorlesung	4 WLH
Examination: Written examination (90 minutes) **Examination requirements:** The students should be able to verify statements on facts and connections from the fields of biochemistry, cell biology, anthropology, ecology and behavior. They should be able to answer questions on definition, function and relevance of molecular, cell biological, organismic and ecological structures and processes in note form as well as to describe and compare these structures and processes.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Volker Lipka
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 1
Maximum number of students: 240	

Georg-August-Universität Göttingen **Module B.Bio.107: Statistics for biologists**	4 C 2 WLH

Learning outcome, core skills: After passing the module the students have a theoretical understanding of basic probabilistic terms and the elementary methods of the descriptive and conclusive statistics. They are able to conduct independently basic statistical tests and estimations.	**Workload:** Attendance time: 28 h Self-study time: 92 h

Course: Statistik (Lecture) It is recommended to attend the accompanying tutorials (2WLH).	2 WLH
Examination: Written examination (120 minutes) **Examination requirements:** The students should be able to apply the statistical approaches, methods and tests covered in the lecture to concrete situations. Here they should be able to find appropriate tests or approaches to solve the questions to a specific situation and solve the given problem numerically with this approach.	4 C

Admission requirements: none	**Recommended previous knowledge:** B.Mat.0811
Language: German	**Person responsible for module:** Prof. Dr. Michael Wibral
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 2
Maximum number of students: 240	

Georg-August-Universität Göttingen **Module B.Bio.111: Anthropology**	10 C 7 WLH

Learning outcome, core skills:	**Workload:**
The students gain insight into the evolution of humans and their primate relatives in respect of their physical configuration, their behavior and molecular systems, as well as the co-evolution of biological and cultural features and comforts. The students learn to identify and analyze biological content in anthropological questions and referencing of cultural, ecological and behavioral batteries of questions. The students get an overview over the main fields in biological anthropology, epistemological basics and derivation in anthropology and learn subject-specific methodology of phylogeny, historical anthropology, behavioral biology of primates, molecular anthropology, human ecology and human ethology. The practical training has two focuses and takes place each at 6 days in both Departments of Anthropology. During the practical training “Evolutionary Anthropology” the students acquire deeper knowledge in the topics: mechanisms in evolution, specialization and phylogeny, evolution of the human being, differentiation in populations, strategies of maintenance, biology, ecology and phylogeny of primates, evolution of social systems, sexual selection, social structures of non-human primates, evolution of human behavior, and strategies of reproduction by means of examples and exercises. The intention is that students learn to apply and operationalize theoretical concepts. In the practical part "Historical Anthropology" the students learn essential methods for anthropological skeleton diagnostics. After practicing basics in general anatomy, the students learn criteria for recording individual features. These include morphological gender identification, morphological diagnosis of age of death, reconstruction of the body height. Furthermore the students learn basics in histology, osteometry and historical demography.	Attendance time: 98 h Self-study time: 202 h

Course: Einführung in die Anthropologie (Humanbiologie) (Lecture)	4 WLH
Course: Praktikum The students pass 6 days each in the department of "Historical Anthropology" **and** in the department of "Evolutionary Anthropology".	3 WLH
Examination: Written examination (120 minutes) **Examination prerequisites:** Participation in the practical course **Examination requirements:** Mechanisms of evolution; speciation and phylogeny; evolution of humans; differentiation of populations; life-history strategies; biology, ecology and phylogenetic history of primates; evolution of social systems; evolution of human behavior; strategies of human reproduction; palaeodemography; palaeopathology; palaeoepidemiology; social structures of human societies; patterns of marriage and migration; human ecology.	10 C

Admission requirements:	**Recommended previous knowledge:**
BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	none

Language: German	**Person responsible for module:** Prof. Dr. Julia Ostner
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 60	

Georg-August-Universität Göttingen **Module B.Bio.112: Biochemistry**	10 C 7 WLH

Learning outcome, core skills: Students acquire basic knowledge of biochemical substances and an overview over elementary principles of biochemical reactions and learn the application of biochemical methods. They get insight into the basics of protein chemistry and genetics: DNA, RNA, enzymes, carbohydrates, lipids and cell membranes; basics of metabolism and signal transduction.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Grundlagen der Biochemie (Lecture)	4 WLH
Course: Biochemisches Grundpraktikum (Internship)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Participation in the practical trainining; audited protocolls **Examination requirements:** Anabolism and catabolism of amino acids, carbohydrates, lipids and nucleic acids; synthesis and function of macromolecules; generation and accumulation of metabolic energy. Biochemical issues in an experiment; execution, documentation, interpretation and evaluation of experiments; teamwork towards the solution of experimental tasks.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. nat. Ellen Hornung
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 160	

Georg-August-Universität Göttingen **Module B.Bio.113: Applied bioinformatics**	10 C 7 WLH

Learning outcome, core skills: After passing the module the students will understand the structure of most databases in bioscientific research and be able to critically assess their content. They will learn to structure biological data and transfer the data to a database scheme. Furthermore the students learn the application of bioinformatical methods in particular on sequence data, biological networks and expression data.	**Workload:** Attendance time: 98 h Self-study time: 202 h

Course: Einführung in die angewandte Bioinformatik (Lecture)	4 WLH
Course: Internet-basierte Bioinformatik (Exercise)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** regular participation in the practical training and successful completion of three exercises **Examination requirements:** The students should know suitable sources of biomedical information available in the internet. They should be able to design and explain simple database schemes. The students should be familiar with measurements for critical assessment of bioinformatical methods; different methods for sequence comparison; reconstruction of phylogenetic trees; application of concepts from information theory on the analysis of sequence data. The students should be able to describe basic characteristics and graph theoretical representations of biological networks and apply these concepts to data analysis.	

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Tim Beißbarth
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 100	

Georg-August-Universität Göttingen **Module B.Bio.115: Algorithmic bioinformatics**	10 C 8 WLH

Learning outcome, core skills: The students acquire knowledge in the bioinformatical fields prediction of RNA structures, Hidden-Markov-Models and gene prediction in pro- and eukaryotes. Furthermore they learn advanced methods for sequence alignment and pattern recognition in sequences, and the application of machine learning methods in Bioinformatics.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Vorlesung "Maschinelles Lernen in der Bioinformatik" mit Übungen	4 WLH
Course: Vorlesung "Algorithmen der Bioinformatik I" mit Übungen	4 WLH
Examination: Oral examination (approx. 40 minutes) **Examination prerequisites:** regular participation in the tutorials **Examination requirements:** Algorithms for optimization; prediction of RNA structures; gene prediction in eukaryotes; advanced methods in sequence alignment; machine learning methods in Bioinformatics; algorithms for pattern recognition in sequences and gene expression data.	10 C

Admission requirements: B.Bio.113, B.Bio.117 BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module B.Bio.116: General developmental and cell biology**	10 C 7 WLH

Learning outcome, core skills: The students learn about developmental aspects in cell biology; fundamental topics in developmental biology of animals and plants; classic and molecular-biological methods in developmental biology and model organisms. In the practical training the students learn handling of model organisms, observe its development and perform basic experiments in developmental biology and developmental genetics.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Allgemeine Entwicklungs- und Zellbiologie (Lecture)	4 WLH
Course: Entwicklungs- und Zellbiologie (Internship)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** participation in the practical course and ausited protocols **Examination requirements:** Structure and compartments of cells, cytoskeleton, mitochondria, membrane structure and transport, contact and communication between cells, cell cycle, cell division, apoptosis, control of gene expression in eukaryotes, mechanisms in development, germ cells and fertilization, cleavage, principles in pattern formation, morphogenesis, gastrulation, neurulation, genesis of organs, cellular movement and shaping, methods from experimental embryology and developmental genetics, model organisms, formation of axis, genes for segmentation, homeotic selection genes, evolutionary developmental biology, neuronal development, stem cells and regeneration, homeostasis, origination of cancer, embryogenesis of plants, dormancy and germination, light dependent development, phytohormones, evolution and genetics during flower formation.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2F-BA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Ernst A. Wimmer
Course frequency: Jedes WiSe; Praktikum in vorlesungsfreier Zeit	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 125	

Georg-August-Universität Göttingen **Module B.Bio.117: Genome analysis**	10 C 7 WLH

Learning outcome, core skills:	**Workload:**
The students will learn basic methods of genome analysis. After successful participation at this module, they have a basic knowledge in the field of genome sequencing, function and structure of genomes and algorithms for bioinformatical genome analysis. In the practical part of the module, the students will acquire a basic knowledge in the operating system LINUX and UNIX, respectively, and in the programming language PERL or in a comparable language. They are able to design and implement simple programs to independently insolve basic data processing tasks in a UNIX/LINUX environment.	Attendance time: 140 h Self-study time: 160 h

Course: LINUX und PERL für Biologen (Internship) *Course frequency:* block course in lecture-free time in winter	3 WLH
Course: Grundlagen der Bioinformatik (Lecture, Exercise) *Course frequency:* each summer semester	4 WLH

Examination: Oral examination (approx. 30 minutes) **Examination prerequisites:** Participation in the practical course and final written exam (pass/fail) **Examination requirements:** Basic methods of genome analysis, in particular genome assembly, sequence alignment and basic algorithms for phylogenetic tree reconstruction based on genome sequences.	10 C

Admission requirements:	**Recommended previous knowledge:**
BSc Biology: at least 40 C from the first study period	none
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: practical course each WiSe; lecture each SoSe	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 6
Maximum number of students: 10	

Additional notes and regulations:
For the lecture, we assume basic programming skills (e.g. from the practical part of the module), therefore the LINUX/PERL course should be completed before attending the lecture.

Georg-August-Universität Göttingen **Module B.Bio.118: Microbiology**	10 C 7 WLH

Learning outcome, core skills:	**Workload:**
Students acquire fundamental knowledge in systematics, cell biology, growth and reproduction, variety of metabolisms and the ecological, medical and biotechnological relevance of microorganisms. In the practical training, the students learn elementary techniques of handling microorganisms (microscopical methods, working under sterile conditions, cultivation, enrichment, singling, differentiation, identification and genetic transformation of microorganisms). After passing the module, the students have the ability to differentiate microorganisms and know important biotechnological processes and mechanisms pathogens use to attack their hosts.	Attendance time: 100 h Self-study time: 200 h

Course: Allgemeine Mikrobiologie (Lecture)	4 WLH
Course: Mikrobiologisches Grundpraktikum (Internship)	3 WLH
Examination: Written examination (120 minutes) **Examination requirements:** In the examination, covering the lecture (part A, 60%) and the practical training (part B, 40%), basics in microbiology are addressed concerning the systematic classification, various metabolic pathways, cell biology, the relevance of microorganisms to the industry, the environment and medicine and their application in these fields. The students should be able to assess current events related to microbiology.	

Admission requirements:	**Recommended previous knowledge:**
BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	none
Language: German	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 100	

Georg-August-Universität Göttingen **Module B.Bio.123: Animal physiology**	10 C 7 WLH

Learning outcome, core skills: The students acquire comprehension for structure and function of nerve cells, glia cells, sensory cells and sensory organs; also comprehension for the principles of central processing of sensory information. They gain insight into the function of hormone systems and different vegetative functions like respiration, energy balance, digestion and excretion. The students gain insight into the complex interaction of physiological performances of the nervous, sensory and vegetative systems and thereby learn to appraise physiological reactions of animals. They learn to assess the relevance of single physiological performances for the whole organism and to better understand its adaptability to existing environmental conditions.	**Workload:** Attendance time: 108 h Self-study time: 192 h

Course: Tierphysiologie (Lecture)	4 WLH
Course: Tierphysiologie (Internship)	3 WLH
Examination: Written examination (120 minutes) **Examination prerequisites:** regular participation in the practical course and at least 80 % audited protocols **Examination requirements:** The Students should be able to validate statements on animal physiological facts and relations in the fields neuro-, sensory and vegetative physiology; they should be able to answer random questions on function of sensory cells, neurons and organs regarding physiological aspects; they should have the ability to correctly describe and compare basics and the activity of physiological processes.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** physikalische Grundkenntnisse, z.B. B.Phy-NF.7002 und B.Phy-NF.7004
Language: German	**Person responsible for module:** apl. Prof. Dr. Andreas Stumpner
Course frequency: each WiSe; practical course during lecture free time	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 108	

Georg-August-Universität Göttingen **Module B.Bio.125: Cell- and molecular biology of plants**	10 C 7 WLH

Learning outcome, core skills: The students gain insight into the characteristics of plant cells, learn to know the relation between structure and function of organelles and the cell wall and get an overview of transport processes and intracellular signal transduction. They learn to know the model plant Arabidopsis thaliana and acquire knowledge in biosynthesis, signal transduction, effects of phytohormones and the molecular methods for adaption of plants to different abiotic and biotic stress factors. The students get an overview of current facts of phylogeny and biotechnology of algae. In the practical training the students acquire methodical knowledge of light and fluorescence microscopy, gene transfer, reporter gene analysis, polymerase chain reaction and detection methods for proteins. They are able to plan, execute, document and discuss scientific findings.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Zell- und Molekularbiologie der Pflanze (Lecture)	4 WLH
Course: Zell- und Molekularbiologie der Pflanze (Internship)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** constant participation in the practical course and audited protocolls **Examination requirements:** Arabidopsis thaliana as model organism for research on cell- and molecular processes; methods for research on cell- and molecular processes; mechanisms of protein transport in different cell organelles and into the cell wall; mechanisms of signal transduction in plants; mechanisms of plant immunity.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Christiane Gatz
Course frequency: each WiSe; pracftical course during lecture free time	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 90	

Georg-August-Universität Göttingen **Module B.Bio.126: Animal and plant ecology**	10 C 7 WLH

Learning outcome, core skills: After passing the module the students have knowledge in the following fields and have the ability to interrelate these to each other: Basics in plant and animal ecology; ecophysiology of higher and lower plants; aut- and synecology; ecosystem research and ecology of soil systems. In the practical training and the seminar the students learn to describe, illustrate and discuss the topics of the lecture in the light of recent publications by concrete examples. After successful completion of the module the students are able to understand ecological relations, assess new insights from the field of environmental research and develop concepts for sustainable solutions for environmental problems.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Ökologie (Lecture)	3 WLH
Course: Tier- und Pflanzenökologische Übung (Internship)	3 WLH
Course: Tier- und Pflanzenökologisches Seminar (Seminar)	1 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** constant participation in the seminar and practical training; audited protocolls; presentation **Examination requirements:** Abiotic environmental conditions; biotic interactions; coevolution; the relevance of the factor “resource”; ecological niche; population models; regulation of populations; relation of populations; competitors; predation; herbivory; mutualism; symbiosis; ecosystems; succession; diversity and disruption; nutrition networks; definition of an individual; Genet- Ramet concept; r-K-concept; case study “Global Change”.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: 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:** 3 - 5
Maximum number of students: 70	

Georg-August-Universität Göttingen **Module B.Bio.127: Evolution, systematics and diversity of plants**	10 C 10 WLH

Learning outcome, core skills: The students acquire basic knowledge in evolution, phylogenetic history, systematics and ecology of terrestrial plants (focus on flowering plants). They learn about the spectrum of methods for the reconstruction of the evolution of land plants in time and location and methods for the systematical classification and denotation. On the basis of selected Central-European families of plants (course materials and field excursions) the students acquire knowledge in systematic classification by drawing and analysis of morphological features as well as the handling of classification books. Through field excursions the students get an overview of the local flora in its natural habitat.	**Workload:** Attendance time: 140 h Self-study time: 160 h

Course: Evolution und Systematik der Pflanzen (Lecture)	4 WLH
Examination: Written examination (60 minutes) **Examination prerequisites:** passing of the practical training "Struktur und Diversität der Pflanzen" **Examination requirements:** The students should be able to validate statements on the evolution and systematics of terrestrial plants and the spectrum of methods for reconstruction of evolution. They should have the ability to answer questions on these topics and also on basics in taxonomy and nomenclature.	10 C

Course: Struktur und Diversität der Pflanzen (Exercise) Encompasses morphological drawing, knowledge in the species the lecture deals with and the preparation of a herbar which is labed based on scientific facts of at least 60 species of plants.	4 WLH
Course: Begleitvorlesung zum Praktikum	1 WLH
Course: Geländepraktikum	1 WLH

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** none
Language: German	**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:** 2 - 6
Maximum number of students: 80	

Georg-August-Universität Göttingen **Module B.Bio.128: Evolution, systematics and diversity of animals**	10 C 8 WLH

Learning outcome, core skills: The students acquire the ability to comprehend basic concepts and the way of thinking of the ecological, evolution biological and systematic research. The students get to know the abundance of structures and phylogenetic relations in selected groups of animals. They acquire abilities in the systematical classification of animals in particular from indigenous biocoenoses and knowledge of the morphology of major European animal families.	**Workload:** Attendance time: 112 h Self-study time: 188 h

Course: Phylogenetisches System und Evolution der Tiere (Lecture)	5 WLH
Course: Bestimmungsübungen und Geländepraktikum	3 WLH

Examination: Written examination (60 minutes) **Examination prerequisites:** constant participation in the practical training, oral examination for identification of animals **Examination requirements:** Phylogeny and evolution of animals; basics in biological systematics (morphological and molecular methods); abundance of structures and phylogenetic relations of selected groups of animals; knowledge in systematics and biology of animal taxa; skills in systematic classification of animals in particular from indigenous biocoenoses.	

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** basics of animal systematics
Language: German	**Person responsible for module:** Prof. Dr. Christoph Bleidorn
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 115	

Georg-August-Universität Göttingen **Module B.Bio.129: Genetics and microbial cell biology**	10 C 7 WLH

Learning outcome, core skills: The students gain basic knowledge of classic and molecular genetics and cell biology as well as an overview of genetic, molecular and cellular biological methods and model organisms. They get an insight into inheritance of genetic information and the complex regulation of gene expression, After passing the module they should have the ability to understand how the development and morphology of single and multicellular organisms are regulated by genes and how genes influence the structure and function of cells. They learn to independently perform simple genetic and molecular biological experiments and to critically question the results.	**Workload:** Attendance time: 100 h Self-study time: 200 h

Course: Genetik und mikrobielle Zellbiologie (Lecture)	4 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** audited protocols **Examination requirements:** The students should be able to answer random questions from the fields of genetic and cell biology and to validate statements on genetic and cellular biological facts and relations. The basis for these abilities is the content of the lecture and the answering of a catalog of questions with the help of the accompanying tutorials. For the genetics prat, the lecture is based on the book Watson, 6th Edition, Molecular Biology of the Gene (Pearson) and for the cell biology part on selected chapters from the book Alberts et al., 5th Edition, Molecular Biology of the Cell (Garland Science).	

Course: Genetik und mikrobielle Zellbiologie (Internship)	3 WLH

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Gerhard Braus
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 94	

Georg-August-Universität Göttingen **Module B.Bio.130: Biocognition**	10 C 7,5 WLH

Learning outcome, core skills: During the lectures, students get an introduction to Cognitive Neuroscience and Cognitive Psychology. They acquire solid knowledge about key concepts of these research areas and relevant research methods. In Cognitive Neuroscience, this includes areas such as central processing of sensory information, attention, learning, memory, language, emotion, stress, chronobiology, homeostasis, and generation of motor behavior. In Cognitive Psychology, students learn the fundamental principles of experimental work in this field, focusing on traditional theories and established paradigms as well as on psychophysiological methods. Based on the knowledge gained in the lectures, the practical course provides an intensely supervised step-by-step building up of the capability to work independently with experimental approaches.	**Workload:** Attendance time: 105 h Self-study time: 195 h

Course: Kognitive Neurowissenschaften (Lecture)	2 WLH
Examination: Written examination (30 minutes)	5 C

Course: Kognitionspsychologie (Lecture)	2 WLH
Examination: Written examination (45 minutes) **Examination prerequisites:** participation in practical courses and written report	5 C

Course: Experimentelle Kognitionspsychologie (Internship) *Course frequency:* vorlesungsfreie Zeit im WiSe	3,5 WLH

Examination requirements: The students should master the basics in Biological and Cognitive Psychology as taught in the lectures. They should be able to understand and describe connections between acquisition of cognitive skills, behavioral patterns, and neural mechanisms underlying (higher) cognitive functions, and to apply this knowledge to new situations.	

Admission requirements: BSc Biology: at least 40 C from the first study period	**Recommended previous knowledge:** SK.Bio.305
Language: German	**Person responsible for module:** Prof. Dr. Annekathrin Schacht
Course frequency: each winter semesterWiSe and SoSe	**Duration:** 2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 4
Maximum number of students: 80	

Georg-August-Universität Göttingen **Module B.Bio.131: Behavioural biology**	10 C 7 WLH

Learning outcome, core skills: The lecture will convey a comprehensive overview of fundamental topics and approaches in the study of animal behavior. The following topics will be discussed in detail and illustrated with examples from current research: basic functions and behavior, orientation in time and space, habitat and food choice, predation, evolutionary bases of sexual selection, intrasexual selection, intersexual selection, parental care, development and control of behavior, evolution of social systems. In the parallel lab session, the theoretical concepts acquired in the lecture course will be applied in practical examples and demonstrations. Students should learn how to apply the theoretical concepts and how to operationalize them.	**Workload:** Attendance time: 98 h Self-study time: 202 h

Course: Einführung in die Verhaltensbiologie (Lecture)	4 WLH
Course: Methoden der Verhaltensbiologie (Internship)	3 WLH

Examination: Written examination (120 minutes) **Examination prerequisites:** regular participation in lab course "Methoden der Verhaltensbiologie"	10 C

Examination requirements: Basic functions and behavior, orientation in time and space, habitat and food choice, predation, evolutionary bases of sexual selection, intrasexual selection, intersexual selection, parental care, development and control of behavior, evolution of social systems.	

Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Peter M. Kappeler
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 4
Maximum number of students: 40	

Georg-August-Universität Göttingen **Module B.Bio.151: Consolidation course in biochemistry**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: Working in small groups, the students learn to independently plan biochemical experiments and organize the day's schedule as well as the self-dependent handling of lab equipment. The application of biochemical and molecular biological methods as well as the development of the understanding of the physico-chemical basics and variables of these methods should enable the students to critically assess the results by appropriate controls and if necessary by error analysis. As key competences, the students acquire basics in investigation and assessment of scientific primary literature as well as the execution of experiments and their critical analysis and presentation.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in biochemistry 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should demonstrate basic comprehension of biochemical processes, which allows them to self-dependently plan and perform experiments and go through putative scenarios conceptually. They should be able to present the performed experiments and the resulting observations and conclusions in written and oral form. Furthermore, the students should have the ability to critically assess results of experiments to allow them to deduce continuative experiments and controls.	10 C

Course: Literature seminar in biochemistry	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** The students should understand biochemical research papers and be able to give a talk in which they present and discuss the contents comprehensibly.	2 C

Admission requirements: B.Bio.112 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** Organische Chemie
Language: German	**Person responsible for module:** Dr. rer. nat. Achim Dickmanns
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 24	

Georg-August-Universität Göttingen **Module B.Bio.152: Consolidation course in bioinformatics**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: By participation in this module the students gain insight into the development and application of bioinformatic methods in concrete research projects. They are able to self-dependently investigate and critically analyze scientific primary and specialized literature. The students learn to prepare and perform scientific presentations in front of an audience.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in bioinformatics 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should be able to describe and document the bioinformatic methods they used in their research project as well as to analyze and evaluate the acquired genomic data in a protocol.	10 C

Course: Literature seminar in bioinformatics	1 WLH
Examination: Lecture (approx. 45 minutes) **Examination requirements:** In the course of the literature seminar, the students give a talk (45 min) in which they present and discuss the main conclusions of a scientific publication.	2 C

Examination requirements: The students should be able to describe and document bioinformatical methods they used in their research project, as well as analyze and evaluate the retrieved genomic data in a protocol. In the course of the literature seminar, the students give a talk (45 min) for presenting and discussing the main conclusions of a scientific publication.	

Admission requirements: completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** B.Inf.1101
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 4	

Additional notes and regulations: For a consolidation course in the working group of Prof. Morgenstern module B.Bio.117 has to be completed; for consolidation in the working group of Prof. Beißbarth module B.Bio.113 has to be completed.

Georg-August-Universität Göttingen **Module B.Bio.153: Consolidation course in developmental biology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: After passing the module the students should be able to self-dependently work on questions of developmental biology by application of methods from life sciences. Therefore, the students acquire detailed knowledge of genetic, molecular biological, embryological and histological lab methods as well as microscopy techniques. Furthermore, they learn the investigation and analysis of scientific primary literature, the presentation of scientific data and they practice critical thinking.	**Workload:** Attendance time: 220 h Self-study time: 140 h

Course: Practical consolidation course in developmental biology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should have the ability to formulate a scientific problem and draft a written report on the applied methods.	10 C

Course: Literature seminar in developmental biology *Course frequency:* each summer semester	1 WLH
Examination: Lecture (approx. 30 minutes) **Examination requirements:** The students should be able to understand primary literature and present its content in a talk (30 min) to their fellow students in a comprehensible manner. Furthermore, the students should have the ability to discuss developmental genetic methods scientifically.	2 C

Admission requirements: B.Bio.116 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Ernst A. Wimmer
Course frequency: each semester; upon request; literature seminar in SoSe	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module B.Bio.155: Consolidation course in microbiology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: The students prove that they are able to perform basic microbiological and molecular biological experiments on the basis of given experimental instructions, to develop the necessary theoretical basics and to analyze, document and present their results in a suitable form. The students acquire advanced knowledge of selected fields of microbiology. Furthermore, they prove their ability to review and present scientific publications. The students acquire the ability to plan and perform the experiments in the practical training self-dependently. They learn how to document primary data, critically analyze results, search for and analyze scientific primary literature and present their results.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in microbiology	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should have the ability to formulate a scientific problem and draft a written report on the applied methods.	10 C

Course: Literature seminar in microbiology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students present a (usually English) scientific publication by giving a talk. In this presentation the students should describe the scientific background, formulate the scientific problem, guide through the experiments and explain the conclusions. The talk should be in form of a free speech and with adequate illustrations. If necessary, the students should include secondary literature.	2 C

Admission requirements: B.Bio.118 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module B.Bio.156: Consolidation course in neurobiology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: After passing the module, the students have knowledge of the basics of behavioral biology, the structure of neurons and neural functions as well as insights into the processing mechanisms of the central nervous system. They are able to perform various physiological experiments self-dependently on the basis of instructions and to evaluate the results. Furthermore, the students learn to accomplish difficult preparations, for example of the insect nervous system. They have the ability to assess the possibilities and restrictions of modes of behavior and neural systems and they are able to critically question the planning and execution of experiments with living animals. They gain the ability to review and assess scientific publications, for critical thinking and for giving scientific presentations.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in neurobiology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should have the ability to formulate a scientific problem and draft a written report on the applied methods.	10 C

Course: Literature seminar in neurobiology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students present a (usually English) scientific publication by giving a talk. In this presentation the students should describe the scientific background, formulate the scientific problem, guide through the experiments and explain the conclusions. The talk should be in form of a free speech and with adequate illustrations. If necessary, the students should include secondary literature.	2 C

Admission requirements: B.Bio.123 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Martin Göpfert
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 18	

Additional notes and regulations:

The capacity of 18 is shared in 12 places in winter semester and 6 places in summer semester.

Georg-August-Universität Göttingen **Module B.Bio.157: Consolidation course in evolution and diversity of plants and algae**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills:	**Workload:**
Within the consolidation course the students acquire basic skills in botanical research, in particular in the fields of plant evolution, phylogeny, karyology biogeography and vegetation science. Furthermore, the students learn to deal with scientific literature – in particular review and assessment – as well as techniques of scientific presentation.	Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in evolution and diversity of plants and algae 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should be able to explain and discuss their project in form of a presentation in advance to the experimental work. They are supposed to describe and discuss the results of their experiments and the applied methods in form of a graded report.	10 C

Course: Literature seminar in evolution and diversity of plants and algae	1 WLH
Examination: Lecture (approx. 20 minutes) **Examination requirements:** The students should be able to understand and discuss original scientific publications and present and discuss their contents comprehensibly to their fellow students in a talk.	2 C

Admission requirements:	**Recommended previous knowledge:**
B.Bio.127 completed first study period; 5 out of 8 biological basic modules	none
Language: German	**Person responsible for module:** Prof. Dr. Elvira Hörandl
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module B.Bio.158: Consolidation course in organismic zoology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: The students acquire deepened insight into the system and structure of organisms, biological systematics (theory and methods) and evolution. Depending on the topic of the project they obtain an introduction into the morphology of insects or into marine diversity and the ecology of marine animals. After passing the module, the students are able to review and assess scientific primary literature and to present scientific contents.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in organismic zoology 6 weeks full-time; upon request	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students are supposed to describe and discuss the results of their scientific research and the applied methods in a graded written report.	10 C

Course: Literature seminar in organismic zoology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students present a (usually English) scientific publication or review by giving a talk. In this presentation the students should describe the scientific background, formulate the scientific problem and explain the conclusions. The talk should be in form of a free speech and with adequate illustrations.	2 C

Admission requirements: B.Bio.128 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** basics of systematics and animal morphology
Language: German	**Person responsible for module:** Prof. Dr. Christoph Bleidorn
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module B.Bio.159: Consolidation course in cell- and molecular biology of plants**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills:	**Workload:**
After passing the module the students have the ability to select adequate molecular methods (cloning of genes, analysis of gene expression, real-time RT-PCR analyses, reporter gene experiments, protein localization, analysis of signal chains, protein-protein interactions, DNA sequencing, DGGE fingerprinting, phylogenetic analysis, plant tissue culture, phytopathologic interaction assays, confocal and fluorescence microscopy) for the self-dependent research on a scientific question during their Bachelor thesis. They are able to investigate individual scientific questions with the help of the learned techniques and to evaluate, document and present their results. The students are familiar with new information that can be obtained by application of the above listed methods and are able to present scientific primary literature and critically question the conclusions. They have the ability to conceptual design, execute, interpret and discuss own research projects.	Attendance time: 220 h Self-study time: 140 h

Course: Practical consolidation course in cell- and molecular biology of plants 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should prove their acquired abilities by writing a report on the methods they applied. The principles and possible application of the methods should be described in the introduction.	10 C

Course: Literature seminar in cell- and molecular biology of plants	1 WLH
Examination: Lecture (approx. 30 minutes) **Examination requirements:** Within the literature seminar the students give a 30-minute PowerPoint presentation in which they explain and discuss the main statements of a scientific publication.	2 C

Admission requirements: B.Bio.125 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Christiane Gatz
Course frequency: each winter semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module B.Bio.161: Consolidation course in genetics and microbial cell biology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: The students learn to use recent methods of genetics and molecular cell biology by self-dependently performing scientific projects on current research topics from the field of eukaryotic microorganisms. After passing the module the students are bale to independently plan and perform experiments on predefined questions, correctly document primary data, critically evaluate the results, review and assess scientific primary literature and present their own and other people's data in oral and written form.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in genetics and microbial cell biology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** In the report the students are supposed to describe the scientific background of their project and describe the performed experiments in an easily comprehensible way with reference to the underlying question, the execution of the experiments, the description of the results including precise documentations and the final conclusions. The results should be placed in the relevant scientific context in a short discussion. The report should include all necessary citations.	10 C

Course: Literature seminar in genetics and microbial cell biology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students present a (usually English) scientific publication by giving a talk. In this presentation the students should describe the scientific background, formulate the scientific problem, guide through the experiments and explain the conclusions. The talk should be in form of a free speech (optionally in English) and with adequate illustrations. If necessary, the students should include secondary literature.	2 C

Admission requirements: B.Bio.129 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** Organic chemistry
Language: German	**Person responsible for module:** Prof. Dr. Heike Krebber
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students:	

6	

Georg-August-Universität Göttingen **Module B.Bio.162: Consolidation course in animal ecology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills: After passing the module the students should have the ability to self-dependently plan and perform experimental ecological projects and discuss the results in context of current scientific literature. Within the literature seminar, the students learn to review scientific primary literature from the field of animal ecology, critically assess the results, develop their own continuative questions and answer them experimentally as well as statistically analyze, describe, discuss and present acquired ecologic data.	**Workload:** Attendance time: 240 h Self-study time: 120 h

Course: Practical consolidation course in animal ecology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** In the report the students are supposed to describe the scientific background of their project and the applied methods. The performed experiments should be described in an easily comprehensible way with reference to the underlying question, the execution of the experiments, the description of the results including precise documentations and the final conclusions. The results should be placed in the relevant scientific context in a short discussion. The report should include all necessary citations.	10 C

Course: Literature seminar in animal ecology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students should give a 15-minute talk in which they explain and discuss the main statements of a scientific publication.	2 C

Admission requirements: B.Bio.126 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Mark Maraun
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module B.Bio.165: Consolidation course in historical anthropology**	12 C 18 WLH

Learning outcome, core skills: The students acquire advanced knowledge of the following topics: structure of human hard tissue; overview on skeleton diagnostics in particular on decomposition phenomena and pathologies; deepened insight into morphological gender and age determination for adults and subadults; molecular biological analysis (PCR, sequencing); methodical knowledge and skills in histological standard techniques; molecular biological analysis (gender determination) and evaluation of results; forensic anthropology (classic and molecular techniques); introduction to phylogenetic history and functional morphology; basics in descriptive and interference statistics; review and assessment of scientific primary literature; basics of self-dependent scientific working.	**Workload:** Attendance time: 252 h Self-study time: 108 h

Course: Practical consolidation course in historical anthropology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students are supposed to describe and discuss the results of their scientific research and the applied methods in a graded written report.	10 C

Course: Literature seminar in historical anthropology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students give a 15-minute PowerPoint presentation in which they explain and discuss the main statements of a scientific publication.	2 C

Admission requirements: B.Bio.111 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. nat. Susanne Hummel
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module B.Bio.166: Consolidation course in biocognition**	12 C 18 WLH

Learning outcome, core skills: Upon successful completion of the module, the students will be able to design and conduct an experimental project within the research areas of Biological and Cognitive Psychology. The main findings of the projects should be critically discussed against the background of recent research literature in these fields. The latter is in the focus of the literature seminar: Here, the students learn to obtain relevant information from empirical work published in leading international journals in the field of Biological and Cognitive Psychology. On this basis, the students develop their own research questions and test them in experiments. Finally, they collect and analyse data self-dependently, and present the main findings of their projects in a written report.	**Workload:** Attendance time: 252 h Self-study time: 108 h

Course: Practical consolidation course in biocognition 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should be able to describe and discuss their own project and the utilized methods in a graded written report.	10 C

Course: Literature seminar in biocognition	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** During the literature seminar, the students need to present the scientific background, objectives, methods, and main findings of a study reported in a scientific publication by giving a talk of 15 minutes duration.	2 C

Admission requirements: B.Bio.130 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Annekathrin Schacht
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 5
Maximum number of students: 4	

Georg-August-Universität Göttingen **Module B.Bio.167: Consolidation course in behavioural biology**	12 C 18 WLH

Learning outcome, core skills: Basics of quantitative behavioral research; methodical knowledge of behavioral observations and the execution of experiments; validation of proximate and ultimate hypotheses; deepened knowledge of conception, execution and evaluation of behavioral biological research; basics of descriptive and inferential statistics; review and assessment of primary scientific literature; basics of self-dependent scientific working.	**Workload:** Attendance time: 252 h Self-study time: 108 h

Course: Practical consolidation course in behavioural biology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students are supposed to describe and discuss the results of their scientific research and the applied methods in a graded written report in form of a short publication.	10 C

Course: Literature seminar in behavioural biology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** Within the literature seminar the students give a 15-minute PowerPoint presentation in which they explain and discuss the main statements of a scientific publication.	2 C

Admission requirements: B.Bio.131 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Julia Ostner
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module B.Bio.168: Consolidation course in plant ecology / palaeoecology**	12 C (incl. key comp.: 2 C) 18 WLH

Learning outcome, core skills:	**Workload:**
The students are introduced to the structure and statistical design of plant ecological experiments and analyses. They learn to perform their own experiments on a plant ecological topic inside the laboratory, in a green house or in the field. Here they should practice the application of recent plant ecologic methods, the statistical analysis and scientific presentation of the collected data and the presentation and interpretation of recent scientific research results. After passing the module, the students have the ability to self-dependently plan and perform pant ecological experiments, document primary data, critically evaluate their own results, review and assess scientific original literature and present the results of plant ecological experiments in oral and written form.	Attendance time: 252 h Self-study time: 108 h

Course: Practical consolidation course in plant ecology / palaeoecology 6 weeks full-time	17 WLH
Examination: Internship report (max. 20 pages) **Examination requirements:** The students should be able to explain and discuss their plant ecological project in form of a presentation in advance to the experimental work. They are supposed to describe and discuss the results of their experiments and the applied methods in form of a graded report.	10 C

Course: Literature seminar in plant ecology / palaeoecology	1 WLH
Examination: Lecture (approx. 15 minutes) **Examination requirements:** The students should be able to understand original scientific publications and present and discuss their contents comprehensibly to their fellow students in a talk.	2 C

Admission requirements: B.Bio.126 completed first study period; 5 out of 8 biological basic modules	**Recommended previous knowledge:** B.Biodiv.341 for palaeoecology, if appropriate
Language: German	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: each semester; upon request	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module B.Bio.190: Scientific project management**	6 C 7 WLH

Learning outcome, core skills: The students should gain comprehension of fundamental aspects of scientific working. They should be able to put scientific developments in a historical context and to understand basics of science philosophy. The students should familiarize themselves with aspects of quality assurance and good scientific practice. They should be able to deal with writing scientific proposals and texts and acquire the ability to critically question scientific statements. Finally, the students should be encouraged to address ethic aspects in Biology.	**Workload:** Attendance time: 98 h Self-study time: 82 h

Course: Gute wissenschaftliche Praxis (Lecture)	1 WLH
Examination: Written examination (90 minutes), not graded **Examination requirements:** The students should prove their text comprehension on the basis of scientific texts. Moreover, they should prove the ability to apply the knowledge from the lecture on provided texts, which means that they have the ability to critically assess scientific facts and to put them into a greater context. They should also be able to write a text with a clear structure of reasoning explaining a given position.	2 C

Course: Wissenschaftliches Projektmanagement	6 WLH
Examination: project proposal for a scientific or applied thesis (max. 10 pages) **Examination requirements:** The students should self-dependently develop and appropriately present the scientific background including literature research, the methods to be applied and the time schedule for the realization of a planned scientific project	4 C

Admission requirements: first study period, 3 out of 8 biological basic modules	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Julia Fischer
Course frequency: B.Bio.190-1 each WiSe, B.Bio.190-2 each semester	**Duration:** 2 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:** 3 - 5
Maximum number of students: 150	

Georg-August-Universität Göttingen **Module B.Biochem-NF.410: Bioanalytics**	3 C 3 WLH

Learning outcome, core skills: After successful completion of the module, the students have a deepened understanding of the scientific principles of modern bioanalytical methods and the principles of quantitative data analysis.	**Workload:** Attendance time: 42 h Self-study time: 48 h

Course: Moderne Methoden der Bioanalytik (Lecture)	2 WLH
Course: Tutorium für Bioanalytik	1 WLH

Examination: Written examination (120 minutes) **Examination requirements:** Knowledge of the following fields: kinetics and thermodynamics of biomolecular interactions; spectroscopic methods including single-molecule spectroscopy, nanotechnology, synthetic biology, systems biology, microfluidics.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**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:** 4
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module B.Che.1201: Introducation to Organic Chemistry**	6 C 5 WLH

Learning outcome, core skills: Nach erfolgreicher Absolvierung des Moduls sollte die bzw. der Studierende • sicher mit der Nomenklatur, den Substanzklassen, funktionellen Gruppen, Bindungstheorie und Projektionen umgehen können. • grundlegende naturwissenschaftliche Kenntnisse und Kompetenzen auf dem Gebiet der Organischen Chemie auf Fragen der Stoffchemie anwenden können. • Prinzipien der Organischen Chemie und ihrer Reaktionsmechanismen als Reaktionsgleichungen formulieren. • mit dem Überblick über organisch-chemische Prozesse einen Bezug zum täglichen Leben und auf Biomoleküle des Zellgeschehens herstellen können.	**Workload:** Attendance time: 70 h Self-study time: 110 h

Course: Vorlesung Experimentalchemie II (Organische Chemie) (Lecture)	
Course: Übungen zur Experimentalchemie II (Organische Chemie)	
Examination: Written examination (120 minutes)	

Examination requirements: Bindungstheorie; Stereochemie; Stoffchemie und einfache Transformationen (Kohlenwasserstoffe, Halogenalkane, Alkohole, Ether, Amine, Aromaten, Carbonyl-Verbindungen, Carbonsäuren und Derivate); Mechanismen (Nucleophile Substitution, Eliminierung, Addition, aromatische Substitution, Oxidation, Reduktion, Umlagerungen, pericyclische Reaktionen); Naturstoffchemie: Fette, Kohlehydrate, Peptide/Proteine, Nukleinsäuren, Terpene, Steroide, Alkaloide, Antibiotika, Flavone	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Ulf Diederichsen
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 2
Maximum number of students: 180	

Georg-August-Universität Göttingen **Module B.Che.4104: Introduction to General and Inorganic Chemistry**	6 C 6 WLH

Learning outcome, core skills: Die Studierenden verstehen die allgemeinen Prinzipien und Gesetzmäßigkeiten der Chemie und sind mit grundlegenden Begriffen der allgemeinen und anorganischen Chemie vertraut. Sie erwerben erste Kenntnisse der anorganischen Stoffchemie.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: "Experimentalchemie I (Allgemeine und Anorganische Chemie)" (Lecture)	4 WLH
Course: "Experimentalchemie I (Allgemeine und Anorganische Chemie)" (Exercise)	2 WLH
Examination: Written examination (120 minutes) **Examination prerequisites:** Erfolgreiche Teilnahme an den Übungen; Näheres regelt die Übungs-Ordnung	6 C

Examination requirements: Allgemeine Chemie: Atombau und Periodensystem, Elemente und Verbindungen, Chemische Gleichungen und Stöchiometrie, Lösungen und Lösungsvorgänge, chemische Gleichgewichte, einfache Thermodynamik und Kinetik, Säure-Base-Reaktionen, Fällungs- und Komplexbildungsreaktionen, Redoxreaktionen; Grundlagen der Anorganischen Chemie: Vorkommen, Darstellung, Eigenschaften einiger Elemente und ihrer wichtigsten Verbindungen.	

Admission requirements: Keine	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Dietmar Stalke
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:**

Georg-August-Universität Göttingen **Module B.Che.7408: Laboratory course in General and Inorganic Chemistry for Biologists**	4 C 4,5 WLH

Learning outcome, core skills: Nach erfolgreichem Absolvieren des Moduls sollte der/die Studierende die grundlegenden und allgemeinen Prinzipien sowie Gesetzmäßigkeiten der allgemeinen und anorganischen Chemie verstanden haben und über einen sicheren Umgang mit den Begrifflichkeiten der allgemeinen und anorganischen Chemie verfügen. Der/die Studierende soll die Arbeitsabläufe in chemischen Laboratorien erlernt haben, insbesondere Konzentrationen und Ausbeuten berechnen können, Lösungen ansetzen, die Grundlagen der Analytik und die Prinzipien guter wissenschaftlicher Praxis beherrschen. Darüber hinaus sollte das sichere Arbeiten im Labor erlernt sein. Hierzu gehören Aspekte der Arbeitssicherheit, wie Geräte zur Brandbekämpfung, Flucht- und Rettungswege, Schutzkleidung im Labor und der sichere Umgang mit Gefahrstoffen.	**Workload:** Attendance time: 63 h Self-study time: 57 h

Course: Chemisches Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie (Lecture) *Course frequency:* jedes Sommersemester (halbsemestrig)	6 WLH
Course: Seminar zum Chemischen Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie (Seminar) *Course frequency:* jedes Sommersemester (halbsemestrig)	2 WLH
Course: Begleitvorlesung zum chemischen Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie (Lecture) *Course frequency:* jedes Sommersemester (halbsemestrig)	1 WLH

Examination: Written examination (60 minutes) **Examination prerequisites:** Erfolgreiche Teilnahme am Praktikum (Testierte Protokolle zu allen Praktikumstagen, unbenotet) **Examination requirements:** Elemente und Verbindungen, Aufbau der Materie, einfache Bindungskonzepte, chemische Gleichungen und Stöchiometrie, chemische Gleichgewichte, einfache Thermodynamik und Kinetik, Säure-Base-Reaktionen inklusive Puffer, Redoxreaktionen, Löslichkeit, einfache Elektrochemie, Vorkommen sowie Darstellung und Eigenschaften der Elemente und ihrer wichtigsten Verbindungen, Aspekte der Arbeitssicherheit.	4 C

Admission requirements: B.Che.4104	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Sven Schneider
Course frequency: jedes Sommersemester (Blockangebot)	**Duration:** 1 semester[s]

Number of repeat examinations permitted: three times	**Recommended semester:**
Maximum number of students: 200	

Additional notes and regulations:
Das Modul wird von den Dozierenden und Assistent/innen der Anorganischen Chemie durchgeführt. Ansprechpersonen für dieses Modul ist Herr Dr. Würtele.

Georg-August-Universität Göttingen **Module B.Che.7409: Laboratory course in General and Organic Chemistry for Biologists**	4 C 4,5 WLH

Learning outcome, core skills: Nach erfolgreichem Absolvieren des Moduls sollte der/die Studierende die grundlegenden und allgemeinen Prinzipien sowie Gesetzmäßigkeiten der allgemeinen und organischen Chemie verstanden haben und über einen sicheren Umgang mit den Begrifflichkeiten der organischen Chemie verfügen. Darüber hinaus sollte der/die Studierende die Grundlagen der spektoskopischen Analytik und der organisch-chemischen Reaktionsführung beherrschen sowie erste Einblicke in die Komplex- und Biochemie erhalten haben.	**Workload:** Attendance time: 63 h Self-study time: 57 h

Course: Chemisches Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie (Lecture) *Course frequency:* jedes Wintersemester (halbsemestrig)	6 WLH
Course: Seminar zum Chemischen Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie (Seminar) *Course frequency:* jedes Sommersemester (halbsemestrig)	2 WLH
Course: Begleitvorlesung zum chemischen Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie (Lecture) *Course frequency:* jedes Wintersemester (halbsemestrig)	1 WLH

Examination: Written examination (60 minutes) **Examination prerequisites:** Erfolgreiche Teilnahme am Praktikum (Testierte Protokolle zu allen Praktikumstagen, unbenotet) **Examination requirements:** Chemische Gleichungen und Stöchiometrie, chemische Gleichgewichte, chemische Reaktionen, Säure-Base-Reaktionen inklusive Puffer, Redoxreaktionen, Elektrochemie, Kinetik, Komplexverbindungen, chemische Nomenklatur, Kohlenwasserstoffe, Aromaten, Addition-, Eliminierung- und Substitutionsreaktionen, funktionelle Gruppen, einfache Stereochemie, Isomerie, Kohlenhydrate, Aminosäuren, Peptide, spektroskopische Methoden.	4 C

Admission requirements: B.Che.1201, B.Che.7408	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Sven Schneider
Course frequency: jedes Wintersemester (halbsemestrig)	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:**
Maximum number of students:	

200	

Additional notes and regulations:
Das Modul wird von den Dozierenden und Assistent/innen der Anorganischen Chemie durchgeführt.
Ansprechpersonen für dieses Modul ist Herr Dr. Würtele.

Georg-August-Universität Göttingen **Module B.Che.8002: Introducation to Physical Chemistry for Biology and Geosciences**	10 C 7 WLH

Learning outcome, core skills: In Rahmen dieses Moduls erlangen die Studierenden ein grundlegendes Verständnis des chemischen Gleichgewichts, der chemischen Kinetik sowie der Elektrochemie unter besonderer Berücksichtigung von Anwendungen im biologisch-medizinischen Bereich.	**Workload:** Attendance time: 98 h Self-study time: 202 h

Course: Einführung in die Physikalische Chemie für Studierende der Biologie und Geowissenschaften (Lecture)	2 WLH
Course: Einführung in die Physikalische Chemie für Studierende der Biologie und Geowissenschaften (Exercise)	2 WLH
Course: Einführung in die Physikalische Chemie für Studierende der Biologie und Geowissenschaften (Seminar)	3 WLH

Examination: Written examination (180 minutes) **Examination prerequisites:** Erfolgreiche Teilnahme an den Übungen und dem Seminar (Die Seminararbeit kann nach der Klausur abgegeben werden).	10 C

Examination requirements: Hauptsätze der Thermodynamik, reale Gase, Thermochemie, chemisches Gleichgewicht, Phasengleichgewicht, Phasendiagramme, Elektrolytlösungen, elektrochemisches Gleichwicht und EMK, formale Kinetik, Enzymkinetik, Arhenius-Gesetz, Theorie des Übergangszustandes.	

Admission requirements: none	**Recommended previous knowledge:** Modul "Mathematische Grundlagen in der Biologie"
Language: German	**Person responsible for module:** Prof. Dr. Andreas Janshoff
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 4
Maximum number of students: 40	

Georg-August-Universität Göttingen **Module B.Inf.1101: Computer Science I**	10 C 6 WLH

Learning outcome, core skills: Studierende • kennen grundlegende Begriffe, Prinzipien und Herangehensweisen der Informatik, kennen einige Programmierparadigmen und Grundzüge der Objektorientierung. • erlangen elementare Grundkenntnisse der Aussagenlogik, verstehen die Bedeutung für Programmsteuerung und Informationsdarstellung und können sie in einfachen Situationen anwenden. • verstehen wesentliche Funktionsprinzipien von Computern und der Informationsdarstellung und deren Konsequenzen für die Programmierung. • erlernen die Grundlagen einer Programmiersprache und können einfache Algorithmen in dieser Sprache codieren. • kennen einfache Datenstrukturen und ihre Eignung in typischen Anwendungssituationen, können diese programmtechnisch implementieren. • analysieren die Korrektheit einfacher Algorithmen und bewerten einfache Algorithmen und Probleme nach ihrem Ressourcenbedarf.	**Workload:** Attendance time: 84 h Self-study time: 216 h

Course: Informatik I (Lecture, Exercise)	6 WLH
Examination: Klausur (90 Minuten) oder mündliche Prüfung (ca. 20 Min.) **Examination prerequisites:** Nachweis von 50% der in den Übungsaufgaben erreichbaren Punkte. Kontinuierliche Teilnahme an den Übungen. **Examination requirements:** In der Prüfung wird das Verständnis der vermittelten Grundbegriffe sowie die aktive Beherrschung der vermittelten Inhalte und Techniken nachgewiesen, z.B. • Kenntnis von Grundbegriffen nachweisen durch Umschreibung in eigenen Worten. • Standards der Informationsdarstellung in konkreter Situation umsetzen. • Ausdrücke auswerten oder Bedingungen als logische Ausdrücke formulieren usw. • Programmablauf auf gegebenen Daten geeignet darstellen. • Programmcode auch in nicht offensichtlichen Situationen verstehen. • Fehler im Programmcode erkennen/korrigieren/klassifizieren. • Datenstrukturen für einfache Anwendungssituationen auswählen bzw. geeignet in einem Kontext verwenden. • Algorithmen für einfache Probleme auswählen und beschreiben (ggf. nach Hinweisen) und/oder einen vorgegebenen Algorithmus (ggf. fragmentarisch) programmieren bzw. ergänzen. • einfache Algorithmen/Programme nach Ressourcenbedarf analysieren. • einfachsten Programmcode auf Korrektheit analysieren. • einfache Anwendungssituation geeignet durch Modul- oder Klassenschnittstellen modellieren.	10 C

Admission requirements:	**Recommended previous knowledge:**
none	none

Language: German	**Person responsible for module:** Prof. Dr. Carsten Damm
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from until
Maximum number of students: 300	

Georg-August-Universität Göttingen **Module B.Inf.1102: Computer Science II**	10 C 6 WLH

Learning outcome, core skills: Die Studierenden • beherrschen die Grundlagen einer deklarativen Programmiersprache und können Programme erstellen, testen und analysieren. • kennen die Bausteine und den Aufbau von Schaltnetzen und Schaltwerken, sie können Schaltznetze und Schaltwerke konstruieren und analysieren. • kennen die Komponenten und Konzepte der Von-Neumann-Architektur und den Aufbau einer konkreten Mikroprozessor-Architektur (z.B. MIPS-32), sie beherrschen die zugehörige Maschinensprache und können Programme erstellen und analysieren. • kennen Aufgaben und Struktur eines Betriebssystems, die Verfahren zur Verwaltung, Scheduling und Synchronisation von Prozessen und zur Speicherverwaltung, sie können diese Verfahren jeweils anwenden, analysieren und vergleichen. • kennen Grundlagen und verschiedene Beschreibungen (z.B. Automaten und Grammatiken) von formalen Sprachen, sie können die Beschreibungen konstruieren, analysieren und vergleichen. • kennen die Syntax und Semantik von Aussagen- und Prädikatenlogik, sie können Formeln bilden und auswerten, sowie das Resolutionskalkül anwenden. • kennen die Schichtenarchitektur von Computernetzwerken, sie kennen Dienste und Protokolle und können diese analysieren und vergleichen. • kennen symmetrische und asymmetrische Verschlüsselungsverfahren und können diese anwenden, analysieren und vergleichen.	**Workload:** Attendance time: 84 h Self-study time: 216 h

Course: Informatik II (Lecture, Exercise)	6 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Nachweis von 50% der in den Übungsaufgaben erreichbaren Punkte. Kontinuierliche Teilnahme an den Übungen. **Examination requirements:** Deklarative Programmierung, Schaltnetze und Schaltwerke, Maschinensprache, Betriebssysteme, Automaten und Formale Sprachen, Prädikatenlogik, Telematik, Kryptographie	10 C

Admission requirements: none	**Recommended previous knowledge:** B.Inf.1101
Language: German	**Person responsible for module:** Dr. Henrik Brosenne
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

twice	
Maximum number of students: 300	

Georg-August-Universität Göttingen **Module B.Inf.1801: Programming**	5 C 3 WLH

Learning outcome, core skills: Die Studierenden erlernen eine aktuelle Programmiersprache, sie • beherrschen den Einsatz von Editor, Compiler und weiteren Programmierwerkzeugen (z.B. Build-Management-Tools). • kennen grundlegende Techniken des Programmentwurfs und können diese anwenden. • kennen Standarddatentypen (z.B. für ganze Zahlen und Zeichen) und spezielle Datentypen (z.B. Felder und Strukturen). • kennen die Operatoren der Sprache und können damit gültige Ausdrücke bilden und verwenden. • kennen die Anweisungen zur Steuerung des Programmablaufs (z.B. Verzweigungen und Schleifen) und können diese anwenden. • kennen die Möglichkeiten zur Strukturierung von Programmen (z.B. Funktionen und Module) und können diese einsetzen. • kennen die Techniken zur Speicherverwaltung und können diese verwenden. • kennen die Möglichkeiten und Grenzen der Rechnerarithmetik (z.B. Ganzzahl- und Gleitkommarithmetik) und können diese beim Programmentwurf berücksichtigen. • kennen die Programmbibliotheken und können diese einsetzen.	**Workload:** Attendance time: 42 h Self-study time: 108 h

Course: Grundlagen der C-Programmierung (Block course)	3 WLH
Examination: Written examination (90 minutes), not graded **Examination requirements:** Standarddatentypen, Konstanten, Variablen, Operatoren, Ausdrücke, Anweisungen, Kontrollstrukturen zur Steuerung des Programmablaufs, Strings, Felder, Strukturen, Zeiger, Funktionen, Speicherverwaltung, Rechnerarithmetik, Ein-/Ausgabe, Module, Standardbibliothek, Präprozessor, Compiler, Linker	5 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Henrik Brosenne
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 120	

Georg-August-Universität Göttingen **Module B.Inf.1802: Training in Programming**	5 C 4 WLH

Learning outcome, core skills: Die Studierenden erlernen eine objektorientierte Programmiersprache, sie • kennen die gängigen Programmierwerkzeuge (Compiler, Build-Management-Tools) und können diese benutzen. • kennen die Grundsätze und Techniken des objektorientierten Programmentwurfs (z.B. Klassen, Objekte, Kapselung, Vererbung, Polymorphismus) und können diese anwenden. • kennen eine Auswahl der zur Verfügung stehenden Application Programming Interfaces (APIs) (z.B. Collections-, Grafik-, Thread-API) • können Dokumentationskommentare benutzen und kennen die Werkzeuge zur Generierung von API-Dokumentation. • kennen Techniken und Werkzeuge zur Versionskontrolle und können diese anwenden. • können Programme erstellen, die konkrete Anforderungen erfüllen, und deren Korrektheit durch geeignete Testläufe überprüfen. • kennen die Prinzipien und Methoden der projektbasierten Teamarbeit und können diese umsetzen.	**Workload:** Attendance time: 56 h Self-study time: 94 h

Course: Programmierpraktikum (Internship, Lecture)	
Examination: Oral examination (approx. 20 minutes) **Examination prerequisites:** Lösung von 50% der Programmieraufgaben und die erfolgreiche Teilnahme an einer großen Gruppenaufgabe. **Examination requirements:** Klassen, Objekte, Schnittstellen, Vererbung, Packete, Exceptions, Collections, Typisierung, Grafik, Threads, Thread-Synchronisation, Prozess-Kommunikation, Dokumentation, Archive, Versionskontrolle	5 C

Admission requirements: B.Inf.1101	**Recommended previous knowledge:** B.Inf.1801
Language: German	**Person responsible for module:** Dr. Henrik Brosenne
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 80	

Georg-August-Universität Göttingen **Module B.Mat.0811: Mathematical foundations of biology**	6 C 4 WLH

Learning outcome, core skills: Nach erfolgreichem Abschluss des Moduls sind die Studierenden in der Lage, mit mathematischen Grundbegriffen umzugehen und kennen mathematische Denk- und Sprechweisen. Sie besitzen ein Formelverständnis sowie Grundkenntnisse über Zahlen, Abbildungen, Differenzial- und Integralrechnung, Differenzialgleichungen und lineare Gleichungssysteme.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Mathematik für Studierende der Biologie (Lecture)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** B.Mat.0811.Ue; Erreichen von mindestens 50 % der Übungspunkte und mindestens einmaliges Vortragen zu Übungsaufgaben	6 C

Course: Mathematik für Studierende der Biologie - Übung (Exercise)	2 WLH

Examination requirements: Formelverständnis, Grundkenntnisse über Zahlen und Grenzwerte, Differenzialrechnung, Integralbestimmung, Lösen von Differenzialgleichungen und linearen Gleichungssystemen	

Admission requirements: keine	**Recommended previous knowledge:** keine
Language: German	**Person responsible for module:** Studiendekan/in Mathematik
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:** 1 - 3
Maximum number of students: not limited	

Additional notes and regulations:

- Dozent/in: Lehrpersonen des Mathematischen Instituts
- Export-Modul für den Bachelor-Studiengang "Biologie"

Georg-August-Universität Göttingen **Module B.Phy-NF.7002: Experimental Physics for Biology Students**	6 C 6 WLH

Learning outcome, core skills: **Lernziele:** Kenntnisse und Verständnis der Grundlagen in den Gebieten Mechanik, Schwingungen und Wellen, Elektrizitätslehre, Optik, Wärmelehre **Kompetenzen:** Die Studierenden sollen in die Lage versetzt werden, grundlegende Konzepte und Zusammenhänge in den oben angegebenen Gebieten zu verstehen und wiederzugeben sowie einfache physikalische Aufgaben zu lösen.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Experimentalphysik I für Biologen (Lecture)	4 WLH
Course: Experimentalphysik I für Biologen (Exercise)	2 WLH

Examination: Written examination (120 minutes) **Examination prerequisites:** Mindestens 50% der Hausaufgaben in den Übungen müssen bestanden worden sein. **Examination requirements:** Grundlagen in den Gebieten Mechanik, Schwingungen und Wellen, Elektrizitätslehre, Optik, Wärmelehre	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** StudiendekanIn der Fakultät für Physik
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: three times	**Recommended semester:**
Maximum number of students: 300	

Additional notes and regulations:
Ausschluss: Das Modul kann nicht belegt werden, wenn bereits das Modul B.Phy-NF.7001 erfolgreich absolviert wurde bzw. wenn das Modul B.Phy-NF.7002 erfolgreich absolviert wurde, kann nicht das Modul B.Phy-NF.7001 belegt werden.

Georg-August-Universität Göttingen **Module B.Phy-NF.7004: Physics Lab for Non-Physics Students**	4 C 3 WLH

Learning outcome, core skills: **Lernziele:** Physikalische Fragestellungen im Experiment, Durchführung, Dokumentation, Auswertung und Bewertung von Experimenten, Teamarbeit zur Lösung experimenteller Aufgaben **Kompetenzen:** Physikalische Experimentier- und Messtechniken sowie Auswertung, Darstellung, Beurteilung und Fehlerabschätzung von Messergebnissen, Grundlagen der Arbeitssicherheit im Physiklabor.	**Workload:** Attendance time: 42 h Self-study time: 78 h

Course: Physikalisches Praktikum für Nichtphysiker	3 WLH

Examination: Protokolle (je max. 3 Seiten zu 14 Versuchen), not graded **Examination prerequisites:** Erfolgreiche Vorbereitung (Ermittlung durch ca. 15-minütige schriftliche Schnelltests (2 Fragen zum anstehenden Versuch, von denen 100% gelöst werden müssen)) und Durchführung der Experimente. **Examination requirements:** Physikalische Fragestellungen im Experiment, Durchführung, Dokumentation, Auswertung und Bewertung von Experimenten, Teamarbeit zur Lösung experimenteller Aufgaben	4 C

Admission requirements: B.Phy-NF.7001 *oder* B.Phy-NF.7002	**Recommended previous knowledge:** Für Che, Geo: B.Phy-NF.7003
Language: German	**Person responsible for module:** StudiendekanIn der Fakultät für Physik
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 200	

Georg-August-Universität Göttingen **Module B.Phy.7601(Bio): Computational Neuroscience: Basics**	4 C 2 WLH

Learning outcome, core skills:	**Workload:**
Goals: Introduction to the different fields of Computational Neuroscience: • Models of single neurons, • Small networks, • Implementation of all simple as well as more complex numerical computations with few neurons. • Aspects of sensory signal processing (neurons as ‚filters'), • Development of topographic maps of sensory modalities (e.g. visual, auditory) in the brain, • First models of brain development, • Basics of adaptivity and learning, • Basic models of cognitive processing. **Kompetenzen/Competences:** On completion the students will have gained… • …overview over the different sub-fields of Computational Neuroscience; • …first insights and comprehension of the complexity of brain function ranging across all sub-fields; • …knowledge of the interrelations between mathematical/modelling methods and the to-be-modelled substrate (synapse, neuron, network, etc.); • …access to the different possible model level in Computational Neuroscience.	Attendance time: 28 h Self-study time: 92 h

Course: Vorlesung	

Examination: Written examination (45 minutes) **Examination requirements:** Actual examination requirements: Having gained overview across the different sub-fields of Computational Neuroscience; Having acquired first insights into the complexity of across the whole bandwidth of brain function; Having learned the interrelations between mathematical/modelling methods and the to-be-modelled substrate (synapse, neuron, network, etc.) Being able to realize different level of modelling in Computational Neuroscience.	4 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Florentin Andreas Wörgötter
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** Bachelor: 2 - 6; Master: 1 - 4

Georg-August-Universität Göttingen **Module SK.Bio-NF.7001: Neurobiology**	3 C 2 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: 60 h

Course: Neurobiology (Lecture)	2 WLH

Examination: Written examination (90 minutes)	3 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: twice	**Recommended semester:** 4 - 6
Maximum number of students: 30	

Additional notes and regulations:
The combination of this module with module SK.Bio.7001 is not possible.

Georg-August-Universität Göttingen **Module SK.Bio.117: Genome analysis**	3 C 2 WLH

Learning outcome, core skills: The students will learn basic methods of genome analysis. After successful participation at this module, they have a basic knowledge in the field of genome sequencing, function and structure of genomes and algorithms for bioinformatical genome analysis.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Grundlagen der Bioinformatik (Lecture)	2 WLH

Examination: Oral examination (approx. 30 minutes) **Examination requirements:** Basic methods of genome analysis, in particular genome assembly, sequence alignment and basic algorithms for phylogenetic tree reconstruction based on genome sequences.	3 C

Admission requirements: none	**Recommended previous knowledge:** basic programming skills (e.g. from the LINUX/PERL course, SK.Bio.114-1) or other programming courses
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 6

Additional notes and regulations:
Das Modul kann nicht in Kombination mit B.Bio.117 oder B.Bio-NF.117 belegt werden.

Georg-August-Universität Göttingen **Module SK.Bio.305: Biostatistics with R**	3 C 2 WLH

Learning outcome, core skills: After successful completion of the module, the students are able to deal with the open statistics programming language R and to apply this language to biological data. They gained the ability to apply statistical methods like descriptive statistics, parametric and non-parametric two-random-sample tests, Chi-Quadrat test, correlation analysis, linear regression analysis and ANOVA.	**Workload:** Attendance time: 30 h Self-study time: 60 h

Course: Einführung in die Biostatistik mit R (Seminar)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** continuous participation in the course; solved exercises **Examination requirements:** Independent analysis of biological data with the help of the programming language R; evaluation and practical application of basic statistical testing methods.	3 C

Admission requirements: none	**Recommended previous knowledge:** basic knowledge in mathematics and statistics
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 23	

Georg-August-Universität Göttingen **Module SK.Bio.306: LaTeX for students of biology**	3 C 3 WLH

Learning outcome, core skills: The students acquire the ability to prepare scientific theses and presentations with the typesetting system LaTeX.	**Workload:** Attendance time: 42 h Self-study time: 48 h

Course: Blockkurs	

Examination: Term Paper (max. 10 pages), not graded **Examination requirements:** After completion of the module, the students should be able to write their theses with the LaTeX typesetting system. It is also discussed how complex presentations can be generated with LaTeX.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Manuel Landesfeind Prof. Dr. Burkhard Morgenstern
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module SK.Bio.307: Linux and Python for biologists**	4 C 3 WLH

Learning outcome, core skills: After passing this module the students have basic knowledge of the operating system Linux and basic knowledge of the programming language Perl or a similar language.	**Workload:** Attendance time: 56 h Self-study time: 64 h

Course: Linux und Python für Biologen (Internship) *Course frequency:* Blockkurs in vorlesungsfreier Zeit	3 WLH
Examination: Written examination (120 minutes), not graded **Examination requirements:** The students should have the ability to independently use the command line interpreter within the operating system Linux and to implement simple programs with the programming language Perl (load date from files, create appropriate data structures, handling of regular expressions, implementation of simple algorithms).	4 C

Admission requirements: none	**Recommended previous knowledge:** B.Bio.113
Language: German	**Person responsible for module:** Prof. Dr. Burkhard Morgenstern
Course frequency: each winter semester; during the lecture free time	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 8	

Additional notes and regulations:
Das Modul kann nicht in Kombination mit B.Bio.117 belegt werden.

Georg-August-Universität Göttingen **Module SK.Bio.310: Ecology of algae**	3 C 2 WLH

Learning outcome, core skills: After passing the module, the students have knowledge of the diversity of algae and cyanobacteria in different bodies of water and its changes with respect to different ecological factors. They can identify groups of algae from water samples and classify the water condition.	**Workload:** Attendance time: 30 h Self-study time: 60 h

Course: Seminar (1 Kurstag) (Seminar)	
Course: Exkursion	
Course: Algenkurs (4 Kurstage)	
Examination: Oral Report (approx. 15 minutes) **Examination requirements:** Subject-specific content of the seminar talks, in particular regarding the diversity of algae and its variation in different bodies of water; preparation and presentation of a comprehensible seminar talk, in which the students should reference subject-specific contents to overall questions such as morphology and phylogeny of algae or different bodies of water and discuss their topic.	3 C

Admission requirements: none	**Recommended previous knowledge:** basic knowledge in Biology, B.Bio.127
Language: German	**Person responsible for module:** Prof. Dr. Thomas Friedl
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 6
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module SK.Bio.315: Bioethics**	3 C 2 WLH

Learning outcome, core skills: By means of 1. the presentation and discussion of selected topics from bioethics (i.a. animal ethics, environmental ethics, medical ethics, ethics of genetics) as well as 2. a general introduction to ethics, moral arguing and the methods of applied ethics the students get an insight into moral issues and problems which arise from the application of natural scientific knowledge and techniques imparted in their studies and they learn how to discuss these moral problems rationally.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Bioethik (Seminar)	2 WLH
Examination: Written examination (120 minutes) **Examination prerequisites:** regular participation in the seminar **Examination requirements:** Knowledge of the topics of bioethics covered in the lecture. Appropriate and differentiated discussion of the moral issues and problems from the lecture both in general and applied to concrete examples. Ability to transfer moral arguments on moral problems of bioethics not covered in the lecture.	3 C

Admission requirements: at least 60 C	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Holmer Steinfath
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 80	

Georg-August-Universität Göttingen **Module SK.Bio.320: Archeometry**	3 C 3 WLH

Learning outcome, core skills:	**Workload:**
The students get an overview over fundamental basics in archeometry. Principles of operation from the inorganic and organic branches of archeometry and the age determination are presented by the following disciplines: anthropology, botany, physical chemistry and geology. The spectrum of methods comprises dendrochronology, analysis of surfaces of human remains, radiography, paleo-ethnobotanical analysis, gas chromatography and mass spectroscopy, DNA analysis, vegetation history and soil analysis. Selected methods are taught and practiced during the practical course. Besides the possible application of different methods, the students learn to appraise the limitations of these methods.	Attendance time: 42 h Self-study time: 48 h

Course: Praktikum und Demonstrationskurs zur Archäometrie	3 WLH
Examination: Written examination (90 minutes), not graded **Examination requirements:** The students should be able to describe the principles of the methods presented in the course. They should have the ability to make basic statements on the materials which should be examined and to give specific examples.	3 C

Admission requirements: none	**Recommended previous knowledge:** basics in Biology; participation in the environmental history colloquium (every second week).
Language: German	**Person responsible for module:** Dr. Birgit Großkopf
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module SK.Bio.326: Membership in the student or academic self-administration**	3 C 1 WLH

Learning outcome, core skills: The students get to know the principles of student and academic self-administration through their active participation. They gain deepened knowledge in the areas of group facilitation and conversation techniques as well as decision-making and conflict resolution behavior in groups. In the accompanying seminar, the students gain knowledge about committees and the organizational structure of the university as well as methods and techniques of self-reflection.	**Workload:** Attendance time: 14 h Self-study time: 76 h

Course: Begleitendes Seminar *Course frequency:* each summer semester	1 WLH
Course: Praxisteil: Mitgliedschaft in der Selbstverwaltung der Fakultät für Biologie und Psychologie 1. Active participation in one of the student associations. 2. Membership in one or more of the following committees / commissions: • Faculty council, Study commission, Finance committee, Examining board, Appointments committee, Student council, Student council parliament *and/or* • (Co-) organization of the orientation week	

Examination: written report (max. 10 pages), not graded **Examination requirements:** Regular attested participation in one of the mentioned committees for at least 8 meetings with a final report on the activities (including a list of the attended meetings).	3 C

Examination requirements:	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Alle Dean of studies in Biology
Course frequency: each semester; accompanying seminar each SoSe	**Duration:** mind. 2 Sem.
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module SK.Bio.327: Internship**	8 C

Learning outcome, core skills: Nach erfolgreichem Abschluss des Moduls … • hat der/die Studierende Einblicke in die Berufspraxis von Biologen erlangt und Erfahrungen in der berufspraktischen Anwendung von Methoden und Techniken sowie der praktischen Umsetzung theoretischen Wissens in Betriebsabläufen gesammelt. • kennt der/die Studierende Verflechtungen und Wechselbeziehungen eines Betriebes mit Behörden, Zulieferfirmen, Abnehmern, Marketing, Vertrieb, Logistik, Verwaltung und Forschung (externe und betriebseigene) und kann diese reflektieren. • ist der/die Studierende in der Lage, einen Bezug zum eigenen bisherigen Studium und den weiteren Studienabsichten herzustellen.	**Workload:** Attendance time: 0 h Self-study time: 240 h

Course: Berufspraktikum (240 Stunden) *Contents*: Das Berufspraktikum ist an einer Einrichtung außerhalb der Universität Göttingen zu absolvieren. Die Inhalte werden daher maßgeblich durch den Betrieb/die Institution bzw. die Wahl der Studierenden bestimmt.	

Examination: Internship report (max. 15 pages), not graded	8 C

Examination requirements: Der Bericht enthält Angaben über Ziele, Struktur, Tätigkeitsspektren, etc., der Einrichtung, an dem das Berufspraktikum durchgeführt wurde sowie Angaben zu den selbstdurchgeführten Tätigkeiten während des Berufspraktikums. Der Bericht schließt mit einer kritischen Schlußbetrachtung und Reflexion über die durchgeführten Tätigkeiten und zur gastgebenden Einrichtung ab.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Alle
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module SK.Bio.330: Algae and lichen of the foothills of the Alpes**	3 C 2 WLH

Learning outcome, core skills: After passing the module, the students have gained knowledge of the diversity of terrestrial algae and lichen in different biotopes of the foothills of the Alpes and have the ability to identify these.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Exkursion ins Voralpengebiet (Course, Seminar) 5-day excursion: course (4 days) with accompanying seminar (1 day)	2 WLH
Examination: Oral Presentation (approx. 15 minutes) **Examination requirements:** Contents of subject-specific seminar talks, in particular concerning the understanding of the diversity of algae and lichen in terrestrial ecosystems; preparation and presentation of a comprehensible seminar talk, in which the students should reference subject-specific contents to interdisciplinary questions like morphology of algae and lichen and discuss their topic.	3 C

Admission requirements: none	**Recommended previous knowledge:** B.Bio.127 basic biological knowledge
Language: German	**Person responsible for module:** Prof. Dr. Thomas Friedl
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:** 6
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module SK.Bio.350: Legal medicine for biology and law students**	3 C 2 WLH

Learning outcome, core skills: After successful completion of the module the students will have • basic knowledge in inspection of the corpse, forensic traumatology, alcohology/ toxicology, psychopathology as well as in forensic molecular biology; • the ability to differentiate between various forms of trauma of the human body; • knowledge of signs and detection of death; • knowledge in basics of medical inspection of the corpse including rules of the funeral system; • methodical skills in preparation of forensic reports and expert opinions; • the ability to apply methods for calculation of blood alcohol concentration; • the ability to use the acquired knowledge in the context of real cases during their future work as judge, state's attorney or lawyer as well as the ability to deal with and assess forensic issues and expert opinions	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Legal Medicine for Biology and Law Students (Lecture)	2 WLH

Examination: computer-assisted written examination (45 minutes) **Examination requirements:** In the examination the students demonstrate • basic knowledge in forensic medicine, • that they can master selected questions from the fields of death theory, forensic traumatology, alcohology and toxicology, psychopathology as well as molecular biology, • that they are able to apply the corresponding methods and that they can approach a forensic case systematically and understand its medical aspects sufficiently.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. med. Wolfgang Grellner
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module SK.Bio.355: Biological psychology I**	3 C 2 WLH

Learning outcome, core skills:	**Workload:**
The students have an overview of the central concepts and research methods of biopsychology: neuro-, sensory and motor physiology, learning, memory, attention, psychopathology, hormones, stress, chronobiology, homeostasis, sexuality, emotions. Besides the knowledge acquisition, the students learn analytical thinking, methodical reflecting and the critical analysis of scientific theories with regard to their underlying empirical findings.	Attendance time: 28 h Self-study time: 62 h

Course: Biopsychologie I (Lecture)	2 WLH
Examination: Written examination (30 minutes) **Examination requirements:** The prove that they have an overview of the central concepts and research methods of biopsychology: neuro-, sensory and motor physiology, learning, memory, attention, psychopathology, hormones, stress, chronobiology, homeostasis, sexuality, emotions.	3 C

Admission requirements:	**Recommended previous knowledge:**
2FBA: at least 20 C from the biological introductory modules	Basic knowledge in Biology
Language: German	**Person responsible for module:** Prof. Dr. Stefan Treue
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 100	

Georg-August-Universität Göttingen **Module SK.Bio.356: Biological psychology II**	3 C 2 WLH

Learning outcome, core skills: After passing the module, the students have a general understanding for the central processing of sensory information and the generation of motor-driven behavior. They acquired knowledge in the fields learning, memory, hormones, stress, concentration, chronobiology and homeostasis.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Biologische Psychologie II (Lecture)	2 WLH
Examination: Written examination (30 minutes) **Examination requirements:** The students should master the basics in biopsychology as taught in the lecture. They should have the ability to understand and describe connections between acquisition of cognitive skills, behavioral patterns and biological basics in neurobiology beyond the application of the learned facts and to apply their knowledge to new situations.	3 C

Admission requirements: 2FBA: at least 20 C from the biological introductory modules	**Recommended previous knowledge:** SK.Bio.355 Lecture "Biopsychologie I", basic knowledge in neuroscience
Language: German	**Person responsible for module:** Prof. Dr. Stefan Treue
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 100	

Additional notes and regulations:
The combination of this module with module B.Bio.130 is not possible.

Georg-August-Universität Göttingen **Module SK.Bio.357: Biological psychology III**	3 C 2 WLH

Learning outcome, core skills: The students acquire knowledge of advanced principles and concepts of neuroscientific biopsychology in the fields of the development of the nervous system, neuroplasticity, pain, multisensory integration, sensomotorics, sensory information processing, decision making, executive functions, attention, psychopharmacology, psychopathology.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Biologische Psychologie III (Lecture)	2 WLH
Examination: Written examination (60 minutes) **Examination requirements:** The students prove that they have achieved the above-mentioned learning objectives.	3 C

Admission requirements: none	**Recommended previous knowledge:** SK.Bio.355, SK.Bio.356
Language: German	**Person responsible for module:** Prof. Dr. Alexander Gail
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3 - 5
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module SK.Bio.365: Introduction to animal research**	3 C 2 WLH

Learning outcome, core skills: Dieses Seminar soll den Studierende einen Einblick in folgende Themenbereiche geben: Verschiedene Tiermodelle für Versuchstierforschung z.B. Nager und Primaten, Meilensteine und Geschichte der Versuchstierforschung, Alternativen zu Tierversuchen, 3R Prinzip und Ethik von Tierversuchen. Außerdem lernen die Studierenden Erkenntnisse im Bereich der Tierversuchsforschung einzuordnen, zu verstehen und diskutieren zu können.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Einführung in die Tierversuchsforschung (Lecture, Seminar)	2 WLH

Examination: Lecture (approx. 30 minutes) **Examination prerequisites:** regelmäßige Teilnahme am Seminar	3 C

Examination requirements: Verständnis und wissenschaftliche Darstellung von Themen der Tierversuchsforschung in einem Vortrag (ca. 20 Minuten) mit anschließender Diskussion (ca. 10 Minuten)	

Admission requirements: B.Bio.102, B.Bio.105, B.Bio.106	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Tobias Kahland
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4 - 6
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module SK.Bio.370: Molecular zoology: Topics and methods**	6 C 8 WLH

Learning outcome, core skills: Molecular methods have become indispensable in zoology. This module addresses students who want to learn the basics of molecular genetic work in theory and practice. Additionally, it provides an overview of various current issues of molecular zoology and the application of molecular methods in insect pest control and insect biotechnology. Learning outcome: • basic knowledge of molecular work and different experimental approaches (i.a. DNA work, cloning, sequencing, sequence analysis). • basics of gene function in animals • methods of gene function analysis (i.a. genetic screens, reverse genetics (RNAi), genome editing (CRISPR / Cas9), transgenesis) • advantages and disadvantages of different molecular model systems • overview of current research topics of molecular zoology (i.a. evolution and development (“EvoDevo”), “EcoDevo”, sex determination, molecular communication, chronobiology) • molecular methods in insect biotechnology After completing the module, the students should be able to: • design and perform molecular biological experiments (i.a. DNA extraction, plasmid preparation, PCR, restriction digestion, cloning). • handle databases with information on gene structure and gene function. • choose appropriate model systems and methods for certain zoological questions and develop experimental strategies.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Einführung in die molekulare Zoologie (Lecture)	1 WLH
Course: Themen der molekularen Zoologie und Biotechnologie (Seminar)	1 WLH
Course: Einführung in die molekulare Zoologie (Exercise)	6 WLH
Examination: Lecture (approx. 30 minutes) **Examination prerequisites:** regular participation in the practical course **Examination requirements:** Understanding and scientific presentation of topics of molecular zoology in a talk (20 minutes) followed by a discussion (about 10 minutes).	6 C

Admission requirements: B.Bio.102, B.Bio.105, B.Bio.106	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Gregor Bucher
Course frequency:	**Duration:**

each winter semester; 3 weeks block course	1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5
Maximum number of students: 5	

Additional notes and regulations:
The combination of this module with module B.Biodiv.370 is not possible.

Georg-August-Universität Göttingen **Module SK.Bio.380: Magnetic Resonance Imaging: Principles and Applications**	6 C 4 WLH

Learning outcome, core skills: Die Studierenden erlangen Kenntnisse über die generellen physikalischen Grundlagen der MRT (NMR, Bildgebung, Kontraste), die verschiedenen MRT Modalitäten (MR-Spektroskopie, strukturelle MRI, funktionelle MR, Echtzeit-MR), Spezifika der MRT beim Tier, Tiermodelle, strukturelle und funktionelle MRT beim Menschen, Analysemethoden der aufgaben-basierten funktionellen MRT (Preprocessing, uni- und multivariate Analyseansätze), resting-state funktionelle MRT, interventionelle MRT und Kombination der Methoden in der multimodalen MRT. Nach Abschluss des Moduls haben die Studierenden das Wissen und das Verständis für die zugrunde liegenden Mechanismen und Konzepte sowohl der MRT-Messtechniken, als auch der Analysemethoden entwickelt. Dies beinhaltet das Wissen über die angemessene Anwendung und die Grenzen der Methoden und Analysen. Die Studierenden sind in der Lage, im Transfer die Angemessenheit von wissensschaftsjournalistischen und Medienberichten über MRT-Studien und deren Ergebnisse fundiert beurteilen zu können.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Einführung in Prinzipien und Anwendungen der MRT (Lecture) *Contents*: Grundprinzipien sowohl der unterschiedlichen MRT-Modalitäten als auch der verschiedenen MRT-Analyseansätze	2 WLH
Course: MRT in Biologie und Psychologie (Seminar) *Contents*: Vorstellung und Diskussion der angemessenen Passung von MR-Methodik, Analyse und wissenschaftlichen Fragestellung an entsprechenden Literaturbeispielen.	2 WLH

Examination: Written examination (120 minutes) **Examination prerequisites:** Regelmäßige Teilnahme am Seminar und Vortrag (ca. 20 Minuten) mit anschließender Diskussion (ca. 10 Minuten)	6 C

Examination requirements: Verständnis und wissenschaftliche Darstellung von Themen der MRT	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. med. vet. Susann Boretius
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 4

Maximum number of students: 24	

Georg-August-Universität Göttingen **Module SK.Bio.7001: Neurobiology**	6 C 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

Course: Neurobiology (Lecture)	2 WLH
Course: Neurobiology (Seminar)	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: twice	**Recommended semester:** 4 - 6

Maximum number of students: 30	

Georg-August-Universität Göttingen **Module SK.Bio.7002: Basic virology**	3 C 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 vacciantion, 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: 100	

Georg-August-Universität Göttingen **Module SK.Bio.7003: Isolation and characterization of fungal contaminations from food or other sources**	3 C 2 WLH

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. Daniela Nordzieke
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 **Module SK.Bio.7004: Environmental microbiology**	3 C 2 WLH

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), not graded **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 **Module SK.Bio.7006: Microbiology of marine and terrestrial habitats**	6 C 6 WLH

Learning outcome, core skills: The students will experience microbial life in extreme environments. Destinations for this excursion will be deep biosphere habitants, hydrothermal springs and marine environments, influenced by rapidly changing salinity (Northern Apennines, Tuscany, Giglio Island). Environmental parameters will be recorded on site, microbial diversity will be estimated and samples for analysis of environmental DNA will be taken and prepared in the field. The aim is the evaluation of microbial diversity and correlation with environmental parameters in a specific site. Students will learn methods for field studies and basic techniques in environmental microbiology. They will gain knowledge in microbial diversity in a specific habitat and in adaptations of microbes in extreme environments.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Preparatory seminar	1 WLH
Course: Microbiology of marine and terrestrial habitats (Excursion) *Course frequency:* block (2 weeks) each summer semester	5 WLH

Examination: written report (max. 20 pages) **Examination prerequisites:** seminar talk, reviewing a focused topic in environmental microbiology related to the excursion, 20 minutes	6 C

Examination requirements: Knowledge on • field work and data processing related to environmental microbiology (sampling, assessment of environmental parameters, sample preparation for diversity analysis) • biotic and abiotic factors shaping a specific habitat • key microbial communities in various environments	

Admission requirements: B.Bio.118, SK.Bio.7004 no requirements needed for students of the MSc MB programme	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Rolf Daniel PD. Dr. Michael Hoppert
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students:	

6	

Georg-August-Universität Göttingen **Module SK.Bio.7007: Methods in molecular virology**	3 C 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. Students are encouraged 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 alternative approaches. The students' solutions are 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	

Georg-August-Universität Göttingen **Module SK.Bio.7008: Molecular biology of HIV replication and pathogenesis**	2 C 1 WLH

Learning outcome, core skills: The students will learn the molecular mechanisms underlying the different steps of HIV replication, including entry, reverse transcription, genome integration, gene expression, assembly, release and maturation. Moreover, innate antiviral defenses and viral countermeasures will be discussed. In addition, insights into humoral immune responses against HIV and challenges associated with the generation of an effective vaccine will be provided. Finally, concepts and components of antiretroviral therapy will be introduced and the zoonotic origin of HIV will be discussed. Students attending the lectures will acquire an understanding of central mechanisms underlying HIV replication and pathogenesis and their blockade by immune responses and antiviral therapy.	**Workload:** Attendance time: 14 h Self-study time: 46 h

Course: Molecular biology of HIV replication and pathogenesis (Lecture)	1 WLH
Examination: Written examination (45 minutes)	2 C

Examination requirements: The students should be able to respond to questions concerning basic aspects of HIV replication, pathogenesis, immune responses and antiviral therapy.	

Admission requirements: none	**Recommended previous knowledge:** SK.Bio.7002
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:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module SK.Bio.7009: Learning with a core facility - protein analytics using mass spectrometry**	3 C 3 WLH

Learning outcome, core skills: In the first part of the course, the students get an introduction to the analysis of proteins using liquid chromatography-coupled mass spectrometry (LCMS), and they will prepare peptide samples themselves for this analysis technique in a practical part. Protein samples derive from current projects of different research groups at the Göttingen Campus. In the second part, the students will learn how to analyze the LCMS raw data for identification and relative quantification of proteins. Approaches for the statistical validation of the results will be introduced. The students will get the opportunity to analyze data on their own with state-of-the-art software tools. They will present their results of their project to their fellow students in a concluding seminar at the end of the course.	**Workload:** Attendance time: 40 h Self-study time: 50 h

Course: Protein analytics using mass spectrometry (Course) Practical course and data analysis software training are supervised by members of two core facilities – LCMS Protein Analytics and Medical Biometry and Statistical Bioinformatics	3 WLH

Examination: Oral Presentation (approx. 15 minutes), not graded **Examination prerequisites:** Regular participation in the practical course	3 C

Examination requirements: The students should present the results of their experiment in English.	

Admission requirements: none	**Recommended previous knowledge:** B.Bio.129 or B.Bio.118 or B.Bio.112 or equivalent Practical experience with protein techniques (e.g. SDS-PAGE)
Language: English	**Person responsible for module:** Dr. rer. nat. Oliver Valerius
Course frequency: winter or summer semester, on demand	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 5 - 6
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module SK.FS.EN-FN-C1-1: Scientific English I**	6 C (incl. key comp.: 6 C) 4 WLH

Learning outcome, core skills: Weiterentwicklung bereits vorhandener diskursiver Fertigkeiten und Kompetenzen auf einem über die Stufe B2 des *Gemeinsamen europäischen Referenzrahmens für Sprachen* hinausgehenden Niveau, mit Hilfe derer auch jede Art von beruflicher und naturwissenschaftlicher Sprachhandlung auf Englisch vollzogen werden kann, wie z.B.: • Fähigkeit, mühelos an allen Unterhaltungen, Diskussionen und Verhandlungen mit allgemeinen und naturwissenschaftlichen Inhalten teilzunehmen und dabei die Gesprächspartner problemlos zu verstehen sowie auf ihre Beiträge differenziert einzugehen bzw. eigene Beiträge inhaltlich komplex und sprachlich angemessen zu formulieren; • Fähigkeit, auch umfangreichere naturwissenschaftliche Publikationen zu allen Themen zu verstehen und unter Anwendung spezifischer Sprachstrukturen und -konventionen sprachlich und stilistisch sicher selbst zu verfassen; • Erwerb spezifischer sprachlicher und stilistischer Strukturen der englischen Sprache sowie Entwicklung eines differenzierten naturwissenschaftlichen Wortschatzes; • Ausbau des operativen landeskundlichen und interkulturellen Wissens über die englischsprachigen Länder im beruflichen und naturwissenschaftlichen Kontext.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Scientific English I (Exercise) *Contents*: a. Studying in the sciences / undergraduate research b. Working in the sciences (including key terminology) c. Scientific misconduct / plagiarism d. Controversial topics in science e. Scientific writing: i. Science essay structure, style and format ii. Professional correspondence (email) in a scientific context f. Presenting / explaining a basic scientific process or procedure g. Discussing current scientific developments In der Lehrveranstaltung werden die vier Sprachfertigkeiten praktisch geübt. Der Kompetenzzuwachs basiert auf Self Assessment, Peer Assessment und dem Feedback der Lehrkraft zu den von den Studierenden erstellten sprachlichen Produkten bzw. bearbeiteten Aufgaben.	4 WLH
Examination: (1) Portfolio: 1-2 mündl. Arbeitsaufträge (ca. 15 Min. - mündl. Ausdruck 25 %) und 2 schriftl. Arbeitsaufträge (insg. max. 1000 Wörter - schriftl. Ausdruck 25 %); sowie (2) schriftl. Prüfung (insg. 90 Min. - Lese- und Hörverstehen jeweils 25 %) **Examination prerequisites:**	6 C

regelmäßige und aktive Teilnahme	

Examination requirements: Nachweis von sprachlichen Handlungskompetenzen in interkulturellen und naturwissenschaftlichen Kontexten unter Anwendung der vier Fertigkeiten Hören, Sprechen, Lesen und Schreiben, d.h. Nachweis der Fähigkeit, rezeptiv wie produktiv auf eine über das Niveau B2 des *Gemeinsamen europäischen Referenzrahmens für Sprachen* hinausgehende Art mit für Naturwissenschaftler typischen mündlichen und schriftlichen Kommunikationssituationen im Kontext von Studium, Forschung und Beruf umzugehen.	

Admission requirements: SK.FS.E-B2-2 (Modul Mittelstufe II) oder Einstufungstest mit abgeschlossenem Niveau B2 des GER	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Jeffrey Park
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module SK.FS.EN-FN-C1-2: Scientific English II**	6 C (incl. key comp.: 6 C) 4 WLH

Learning outcome, core skills: Weiterentwicklung vorhandener diskursiver Fertigkeiten und Kompetenzen bis zum Niveau C1 des *Gemeinsamen europäischen Referenzrahmens für Sprachen*, mit Hilfe derer auch sehr komplexe berufliche und naturwissenschaftliche Sprachhandlungen auf Englisch vollzogen werden können, wie z.B.: • Weiterentwicklung der Fähigkeit, mühelos an allen Unterhaltungen, Diskussionen und Verhandlungen mit allgemeinen und naturwissenschaftlichen Inhalten teilzunehmen, solche mündlichen Kommunikationssituationen zu leiten bzw. aktiv mitzugestalten sowie eigene Beiträge inhaltlich komplex und sprachlich angemessen zu formulieren; • Weiterentwicklung der Fähigkeit, auch umfangreichere naturwissenschaftliche Publikationen zu allen Themen zu verstehen und unter Anwendung spezifischer Sprachstrukturen und -konventionen sprachlich und stilistisch sicher auf einem hohen Niveau selbst zu verfassen; • ergänzender Erwerb spezifischer sprachlicher und stilistischer Strukturen der englischen Sprache sowie Weiterentwicklung eines differenzierten naturwissenschaftlichen Wortschatzes; • Ausbau des operativen landeskundlichen und interkulturellen Wissens über die englischsprachigen Länder im beruflichen und naturwissenschaftlichen Kontext.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Scientific English II (Exercise) *Contents*: a. Why people should trust scientists / science skepticism b. Best practice versus research misconduct (historical and current perspectives) c. Communicating in science d. Working in science: gender issues e. Debating controversial topics in science f. Scientific writing: i. Informative abstract structure, style and format ii. Scientific literature review (annotated bibliography) g. Presenting and contextualizing a scientific artifact h. Analyzing and discussing scientific research papers In der Lehrveranstaltung werden die vier Sprachfertigkeiten praktisch geübt. Der Kompetenzzuwachs basiert auf Self Assessment, Peer Assessment und dem Feedback der Lehrkraft zu den von den Studierenden erstellten sprachlichen Produkten bzw. bearbeiteten Aufgaben.	4 WLH
Examination: (1) Portfolio: 1-2 mündl. Arbeitsaufträge (ca. 15 Min. - mündl. Ausdruck 25 %) und 2 schriftl. Arbeitsaufträge (insg. max. 1000 Wörter -	6 C

schriftl. Ausdruck 25 %); sowie (2) schriftl. Prüfung (insg. 90 Min. - Lese- und Hörverstehen jeweils 25 %) **Examination prerequisites:** regelmäßige und aktive Teilnahme	

Examination requirements: Nachweis von sprachlichen Handlungskompetenzen in interkulturellen und naturwissenschaftlichen Kontexten unter Anwendung der vier Fertigkeiten Hören, Sprechen, Lesen und Schreiben, d.h. Nachweis der Fähigkeit, rezeptiv wie produktiv auf eine dem Niveau C1 des *Gemeinsamen europäischen Referenzrahmens für Sprachen* angemessene Art mit für Naturwissenschaftler typischen mündlichen und schriftlichen Kommunikationssituationen im Kontext von Studium, Forschung und Beruf umzugehen.	

Admission requirements: SK.FS.EN-FN-C1-1 Modul Scientific English I für die Naturwissenschaften	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Jeffrey Park
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	