

Directory of Modules

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Modules

B.Agr.0359: Agrarökologie und Biodiversität.....	6808
B.Bio.102: Ringvorlesung Biologie II.....	6810
B.Bio.103: Grundpraktikum Botanik.....	6811
B.Bio.104: Grundpraktikum Zoologie.....	6812
B.Bio.105: Ringvorlesung Biologie I - Teil A.....	6813
B.Bio.106: Ringvorlesung Biologie I - Teil B.....	6814
B.Bio.107: Statistik für Biologen.....	6815
B.Bio.111: Anthropologie.....	6816
B.Bio.112: Biochemie.....	6818
B.Bio.116: Allgemeine Entwicklungs - und Zellbiologie.....	6819
B.Bio.118: Mikrobiologie.....	6820
B.Bio.123: Tierphysiologie.....	6821
B.Bio.126: Tier- und Pflanzenökologie.....	6822
B.Bio.127: Evolution, Systematik und Vielfalt der Pflanzen.....	6823
B.Bio.128: Evolution, Systematik und Vielfalt der Tiere.....	6824
B.Bio.129: Genetik und mikrobielle Zellbiologie.....	6825
B.Bio.131: Verhaltensbiologie.....	6826
B.Biodiv.330: Biodiversität.....	6827
B.Biodiv.331: Biodiversität und Ökologie indigener Fauna und Flora.....	6829
B.Biodiv.332: Evolution.....	6830
B.Biodiv.333: Pflanzenökologie.....	6832
B.Biodiv.334: Tierökologie.....	6833
B.Biodiv.339: Vegetationsökologie: Wälder.....	6834
B.Biodiv.340: Naturschutzbiologie.....	6836
B.Biodiv.341: Palynologie und Paläoökologie.....	6837
B.Biodiv.342: Wissenschaftliche Methoden und Projektmanagement.....	6838
B.Biodiv.343: Berufspraktikum.....	6839
B.Biodiv.355: Methoden der Systematischen Botanik I.....	6840
B.Biodiv.357: Analysemethoden und Experimente zur Diversität von Algen und Cyanobakterien.....	6841

B.Biodiv.358: Methoden der Systematischen Botanik II: Evolution der Blütenpflanzen.....	6843
B.Biodiv.360: Klimaerwärmung und Vegetation.....	6844
B.Biodiv.365: Statistik - Grundlagen und Anwendungen in der Ökologie.....	6845
B.Biodiv.370: Molekulare Zoologie: Themen und Methoden.....	6846
B.Biodiv.375: Geografische Informationssysteme (GIS) in der Biodiversitätsforschung.....	6848
B.Biodiv.380: Urbane Ökologie und Biodiversität.....	6849
B.Biodiv.390: Vegetationsökologie: Stadt und Gewässer.....	6850
B.Biodiv.395: Methoden der systematischen Zoologie.....	6852
B.Che.1201: Einführung in die Organische Chemie.....	6853
B.Che.4104: Allgemeine und Anorganische Chemie (Lehramt und Nebenfach).....	6854
B.Che.7408: Chemisches Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie.....	6855
B.Che.7409: Chemisches Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie.....	6857
B.Che.8002: Einführung in die Physikalische Chemie für Studierende der Biologie und Geowissenschaften.....	6859
B.Mat.0811: Mathematische Grundlagen in der Biologie.....	6860
B.Phy-NF.7002: Experimentalphysik I für Biologen.....	6861
B.Phy-NF.7004: Physikalisches Praktikum für Nichtphysiker.....	6862
SK.FS.EN-FN-C1-1: Scientific English I - C1.1 - Fachsprache Englisch für die Naturwissenschaften I.....	6863

Index by areas of study

I. Bachelor's degree programme "Biological diversity and ecology"

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

1. Core studies

Modules with a total of 120 C have to be successfully completed according to the following regulations.

a. Compulsory modules

The following modules with a total of 80 C have to be successfully completed.

aa. Orientation modules

Es müssen folgende fünf Module im Umfang von insgesamt 30 C erfolgreich absolviert werden.

B.Bio.105: Lecture series biology I - part A (general biology, zoology) (5 C, 4 SWS) - Orientierungsmodul.....	6813
B.Bio.106: Lecture series biology I - part B (anthropology, ecology and cell biology) (5 C, 4 SWS) - Orientierungsmodul.....	6814
B.Bio.102: Lecture series biology II (8 C, 6 SWS) - Orientierungsmodul.....	6810
B.Bio.103: Basic practical course botany (6 C, 5 SWS) - Orientierungsmodul.....	6811
B.Bio.104: Basic practical course zoology (6 C, 5,5 SWS) - Orientierungsmodul.....	6812

bb. Non-biological compulsory modules

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

B.Che.4104: Introduction to General and Inorganic Chemistry (6 C, 6 SWS) - Pflichtmodul..	6854
B.Che.7408: Laboratory course in General and Inorganic Chemistry for Biologists (4 C, 4,5 SWS) - Pflichtmodul.....	6855

cc. Biological basic modules

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

B.Bio.126: Animal and plant ecology (10 C, 7 SWS) - Pflichtmodul.....	6822
B.Bio.127: Evolution, systematics and diversity of plants (10 C, 10 SWS) - Pflichtmodul.....	6823
B.Bio.128: Evolution, systematics and diversity of animals (10 C, 8 SWS) - Pflichtmodul.....	6824
B.Biodiv.332: Evolution (10 C, 8 SWS) - Pflichtmodul.....	6830

b. Subject-specific elective modules

Modules with a total of 20 C have to be successfully completed according to the following regulations.

aa. Elective modules

At least one of the following modules with 10 C has to be successfully completed.

B.Bio.116: General developmental and cell biology (10 C, 7 SWS).....	6819
B.Bio.118: Microbiology (10 C, 7 SWS).....	6820
B.Bio.123: Animal physiology (10 C, 7 SWS).....	6821
B.Biodiv.330: Biodiversity (10 C, 9 SWS).....	6827

bb. Optional modules

One or two of the following modules with a total of 10 C or another module under paragraph aa) totalling 10 C has to be successfully completed.

(If module B.Phy-NF.7002 is chosen, module B.Phy-NF.7004 has to be completed additionally and vice versa. If module B.Che.1201 is chosen, module B.Che.7409 has to be completed additionally and vice versa.)

B.Bio.111: Anthropology (10 C, 7 SWS).....	6816
B.Bio.112: Biochemistry (10 C, 7 SWS).....	6818
B.Bio.129: Genetics and microbial cell biology (10 C, 7 SWS).....	6825
B.Bio.131: Behavioural biology (10 C, 7 SWS).....	6826
B.Mat.0811: Mathematical foundations of biology (6 C, 4 SWS).....	6860
B.Bio.107: Statistics for biologists (4 C, 2 SWS).....	6815
B.Phy-NF.7002: Experimental Physics for Biology Students (6 C, 6 SWS).....	6861
B.Phy-NF.7004: Physics Lab for Non-Physics Students (4 C, 3 SWS).....	6862
B.Che.8002: Introduction to Physical Chemistry for Biology and Geosciences (10 C, 7 SWS).....	6859
B.Che.1201: Introduction to Organic Chemistry (6 C, 5 SWS).....	6853
B.Che.7409: Laboratory course in General and Organic Chemistry for Biologists (4 C, 4,5 SWS).....	6857

c. Cross-disciplinary elective modules

Modules with a total of 12 C have to be successfully completed according to the following regulations.

aa. Pflichtmodul

The following module with 6 C has to be successfully completed.

SK.FS.EN-FN-C1-1: Scientific English I (6 C, 4 SWS) - Pflichtmodul.....	6863
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bb. Elective modules

Modules with a total of at least 6 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 "Key competencies" from the directory of modules of the Bachelor's degree programme "Biology".

d. Internship

With the completion of an internship in a non-university institution relevant to the scientific field of the study programme 8 C are earned. The internship is performed full time for six to eight weeks in the lecture-free time.

B.Biodiv.343: Internship (8 C) - Pflichtmodul.....6839

2. Professionalisation

A total of 48 C have to be earned according to the following regulations.

a. Elective modules

Seven modules with a total of 42 C must be successfully completed.

B.Biodiv.331: Biodiversity and ecology of indigenous fauna and flora (6 C, 7 SWS).....6829

B.Biodiv.333: Plant ecology (6 C, 10 SWS).....6832

B.Biodiv.334: Animal ecology (6 C, 9 SWS).....6833

B.Biodiv.339: Vegetation ecology: Woodlands (6 C, 10 SWS).....6834

B.Biodiv.340: Conservation biology (6 C, 10 SWS).....6836

B.Biodiv.341: Palynology and palaeoecology (6 C, 8 SWS).....6837

B.Biodiv.355: Methods of systematic botany I (6 C, 7 SWS).....6840

B.Biodiv.357: Analysis methods and experiments related to the diversity of algae and cyanobacteria (6 C, 8 SWS).....6841

B.Biodiv.358: Methods of systematic botany II: Evolution of flowering plants (6 C, 6 SWS).....6843

B.Biodiv.360: Climate warming and vegetation (6 C, 8 SWS).....6844

B.Biodiv.365: Statistics - basics and applications in ecology (6 C, 6 SWS).....6845

B.Biodiv.370: Molecular zoology: Topics and methods (6 C, 8 SWS).....6846

B.Biodiv.375: Geographic Information Systems (GIS) in biodiversity research (6 C, 8 SWS).....6848

B.Biodiv.380: Urban ecology and biodiversity (6 C, 8 SWS).....6849

B.Biodiv.390: Vegetation ecology: Urban and riparian systems (6 C, 10 SWS).....6850

B.Biodiv.395: Methods of systematic zoology (6 C, 9 SWS).....6852

B.Agr.0359: Agroecology and biodiversity (6 C).....6808

b. Compulsory module

The following compulsory module with 6 C has to be completed.

B.Biodiv.342: Scientific methods and project management (6 C, 7 SWS) - Pflichtmodul..... 6838

3. Bachelor thesis

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

Georg-August-Universität Göttingen Module B.Agr.0359: Agroecology and biodiversity		6 C
Learning outcome, core skills: Die Studierenden sollen lernen, wie man sich ein interessantes Thema der Biodiversitätsforschung erarbeitet, wie man ökologische Experimente und Untersuchungen anlegt und welche Möglichkeiten der Datenauswertung bestehen. Sie bekommen einen breiten Überblick über die ökologische Bedeutung des Flächenmosaiks eines landwirtschaftlichen Betriebs und dessen Folgen für die Erhaltung der Biodiversität.		Workload: Attendance time: 56 h Self-study time: 124 h
Course: Agrarökologie und Biodiversität (Block course, Internship, Seminar) <i>Contents:</i> In diesem Block-Kurs werden aktuelle ökologische Fragestellungen, wie sie im Zusammenhang mit der Bewirtschaftung eines landwirtschaftlichen Betriebes auftauchen, im Hinblick auf mögliche Biodiversitäts-orientierte Experimente und Untersuchungen diskutiert. Es werden Methoden der Ökologie und Beispiele für erfolgversprechende Felduntersuchungen vorgestellt. In Kleingruppen erarbeiten sich die Studierenden ein Thema, das im folgenden unter genauer Anleitung bearbeitet wird. Beispielsweise wird anhand des Versuchsguts in Deppoldshausen untersucht, welche Rolle Waldränder und Hecken für die Besiedlung des Ackers haben, welche Lebensraumtypen für die Biodiversität besonders wichtig sind, wie sich organisch und konventionell bewirtschaftete Flächen unterscheiden, etc.		
Examination: Präsentation, Referat oder Korreferat (ca. 12 Minuten, Gewichtung 30%) und Hausarbeit (max. 20 Seiten, Gewichtung 70%) Examination requirements: Wissen über ökologische Fragestellungen, die bei der Bewirtschaftung eines landwirtschaftlichen Betriebes auftreten. Kenntnisse zu Untersuchungsmethoden der Ökologie und Beispiele für erfolgversprechende Felduntersuchungen. Überblick über Möglichkeiten der Datenauswertung. Referat: In einem 12-minütigen Referat werden die Ergebnisse der Felduntersuchungen präsentiert und kritisch diskutiert. Dies beinhaltet neben einer kurzen Einleitung die Darstellung der Untersuchungshypothesen, Feld-/Labormethoden, statistische Datenauswertung und eine Diskussion der Ergebnisse unter Einbeziehung von Sekundärliteratur, wie z.B. wissenschaftlichen Fachpublikationen (30% der Modulnote). Erarbeitung von Hausarbeit: In einer schriftlichen Hausarbeit (Umfang max. 20 Seiten) werden die Versuche im Stil einer wissenschaftlichen Veröffentlichung dargelegt. Die Hausarbeit wird hierbei gegliedert in: Zusammenfassung, Einleitung, Hypothesen, Methoden, Resultate, Diskussion und Quellen. Neben formalen Aspekten (z.B. Darstellung der Ergebnisse, Orthografie, korrekte Zitierweise) steht insbesondere die Diskussion der eigenen Ergebnisse unter Berücksichtigung der wissenschaftlichen Fachliteratur im Fokus der Prüfungsanforderungen (70% der Modulnote).		6 C
Admission requirements: none	Recommended previous knowledge: none	

Language: German	Person responsible for module: Prof. Dr. Teja Tschardtke
Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester:
Maximum number of students: 20	

Georg-August-Universität Göttingen		8 C
Module B.Bio.102: Lecture series biology II		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		6 C
Module B.Bio.103: Basic practical course botany		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		6 C
Module B.Bio.104: Basic practical course zoology		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		5 C 4 WLH
Module B.Bio.105: Lecture series biology I - part A (general biology, zoology)		
Learning outcome, core skills: 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).		Workload: 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 evolutionary, 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		5 C 4 WLH
Module B.Bio.106: Lecture series biology I - part B (anthropology, ecology and cell biology)		
Learning outcome, core skills: 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.		Workload: 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		4 C
Module B.Bio.107: Statistics for biologists		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: 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.		Workload: 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: 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. 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		10 C 7 WLH
Module B.Bio.112: Biochemistry		
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 training; audited protocols 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.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		10 C 7 WLH
Module B.Bio.118: Microbiology		
<p>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.</p> <p>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).</p> <p>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.</p>		<p>Workload: Attendance time: 100 h Self-study time: 200 h</p>
Course: Allgemeine Mikrobiologie (Lecture)		4 WLH
Course: Mikrobiologisches Grundpraktikum (Internship)		3 WLH
<p>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.</p>		
<p>Admission requirements: BSc Biology: at least 40 C from the first study period 2FBA: at least 20 C from the biological introductory modules</p>	<p>Recommended previous knowledge: none</p>	
<p>Language: German</p>	<p>Person responsible for module: Prof. Dr. Jörg Stülke</p>	
<p>Course frequency: each summer semester</p>	<p>Duration: 1 semester[s]</p>	
<p>Number of repeat examinations permitted: twice</p>	<p>Recommended semester: 4 - 6</p>	
<p>Maximum number of students: 100</p>		

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.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 protocols; 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	10 C 10 WLH
Module B.Bio.127: Evolution, systematics and diversity of plants	
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 labeled 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		10 C 8 WLH
Module B.Bio.128: Evolution, systematics and diversity of animals		
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		10 C 7 WLH
Module B.Bio.129: Genetics and microbial cell biology		
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 part, 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		10 C
Module B.Bio.131: Behavioural biology		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		10 C
Module B.Biodiv.330: Biodiversity		9 WLH
<p>Learning outcome, core skills:</p> <p>The module comprises three different lectures and courses, respectively. In the lecture “Phylogenetic system, evolution and diversity of insects”, the students get an introduction to phylogenetic history, diversity and biology of insects using the example of the evolutionary most successful and ecologically most important class of animals. This is complemented by the morphologically oriented seminar within this module (see below). The lecture “Aspects of evolutionary biology” covers major topics of evolutionary biology, whereby - partly based on topics from the lecture “Evolution” from the identically named compulsory module for the Bachelor studies in “Biological diversity and ecology” – it focuses on insects but also includes thematically relevant research and insights for other groups of organisms. Topics include flight, parasitism, finding of mating partners, communication and colony building (topics might change annually). In the associated seminar, the students are - in addition to the mentioned morphological part - introduced to principles of taxonomy, current phylogenetic methods and handling of databases. The major learning objective is the acquisition of profound basic knowledge of the diversity of a specific group of organisms (here: insects with comparison to other taxa) and of the interactions of selected species with their environment.</p>		<p>Workload:</p> <p>Attendance time: 126 h</p> <p>Self-study time: 174 h</p>
Course: Phylogenetic system, evolution and diversity of insects (Lecture)		2 WLH
Course: Problems of evolutionary biology, especially insects - biological diversity at supraindividual level (Lecture)		2 WLH
Course: Biodiversity - taxonomy, phylogeny and functional morphology of insects (Exercise)		5 WLH
<p>Examination: Written examination (90 minutes)</p> <p>Examination prerequisites:</p> <p>Regular participation in the tutorial with written protocol (max. 10 pages)</p> <p>Examination requirements:</p> <p>Lecture “Phylogenetic system, evolution and diversity of insects “: basics of the diversity of forms, the morphological structures and phylogenetic connections within the class of insects.</p> <p>Lecture “Aspects of evolutionary biology”: biology of insects and selected other taxa with their specific structural and physiological adaptations to various habitat conditions including temporary and permanent inability to fly, parasitism, reproduction, communication and colony building.</p> <p>The seminar provides supplementary information to both lectures which are not part of the written examination.</p>		
Admission requirements:	Recommended previous knowledge:	
none	none	
Language:	Person responsible for module:	
German	Dr. rer. nat. Christian Fischer	

Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 4
Maximum number of students: 12	

Georg-August-Universität Göttingen Module B.Biodiv.331: Biodiversity and ecology of indigenous fauna and flora	6 C 7 WLH
Learning outcome, core skills: The students acquire knowledge of species of the indigenous flora and fauna as well as knowledge on the biology and ecology of selected animal and plant species in local ecosystems. Using current identification keys, students acquire expertise for the classification of plant and animal species through comparative studies of preserved and living organisms in the laboratory and in the field. The students gain an overview of the degree of endangerment of certain animal and plant species in Germany, its causes and protection measures. In the botanical excursions, students get to know typical plant communities of the Central German Uplands and characterize their species composition.	Workload: Attendance time: 116 h Self-study time: 64 h
Course: One classification exercise from the following options: <ul style="list-style-type: none"> • Introduction to pollen analysis <i>or</i> • Introduction to the biodiversity of Hymenoptera <i>or</i> • Introduction to the biodiversity of Poaceae, Juncaceae and Cyperaceae <i>or</i> • Introduction to the biodiversity of Diptera <i>or</i> • Introduction to the biodiversity of the indigenous avifauna <i>or</i> • equivalent classification exercise on the biodiversity of other selected plant or animal groups 	5 WLH
Course: Two one-day botanical excursions	2 WLH
Examination: Minutes / Lab report (max. 10 pages) Examination prerequisites: one report per excursion (max. 10 pages incl. list of species) Examination requirements: Knowledge of the discussed animal and plant species, their systematic classification, their biogeography and basics of their ecology.	6 C
Admission requirements: General admission requirements for modules of the second study section BSc Biodiv (see PStO)	Recommended previous knowledge: none
Language: German	Person responsible for module: PD Dr. Dirk Gansert
Course frequency: each semester	Duration: 2 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6
Maximum number of students: 30	

Georg-August-Universität Göttingen		10 C 8 WLH
Module B.Biodiv.332: Evolution		
Learning outcome, core skills: In the lecture "Evolution", the students acquire basic knowledge of evolution based on the history of research on the development of life. The fundamental mechanisms of evolution (natural and sexual selection, speciation, etc.) are illustrated with examples and further discussed with respect to human evolution. Both "classic" examples of evolutionary change and recent findings are presented and discussed. The phylogenetic classification scheme as a basis for our picture of evolution is also discussed. An essential sub-aspect is covered by the separately announced lecture "Biogeography". It gives an introduction to the basics of biogeographic differentiation of the vegetation of the earth and of the underlying climatic, geologic-geographical and evolutionary principles. Essential aspects of the vegetation zoning, areal formation and dynamics in the change of vegetation in spatial and temporal dimension are presented. In the seminar "Evolutionary biology of plants and animals" students report about interesting results or methods of evolutionary research with free choice of topic. In the course "Evolution and biogeography" the students are supposed to prepare a seminar paper on the topic of the seminar talk or another freely selectable topic from evolutionary biology, whereby all criteria for writing scientific texts are to be applied.		Workload: Attendance time: 84 h Self-study time: 216 h
Course: Evolutionsbiologie der Pflanzen und der Tiere (Seminar)		2 WLH
Examination: oral presentation (ca. 15 minutes) with written report (max. 12 pages) Examination requirements: Oral presentation: free choice of topic from the field of current findings or methods of evolutionary research Written report on the topic of the seminar presentation or another, freely selectable topic of evolutionary biology meeting the criteria for scientific writing.		5 C
Course: Evolution und Biogeografie (Lecture)		3 WLH
Examination: Written examination (90 minutes) Examination requirements: Mechanisms of evolution including human evolution; classic examples of evolutionary change; importance of phylogenetic systematics for the understanding of evolution.; biogeographic differentiation of the vegetation zones of the earth and its abiotic and biotic causes; essential aspects of areal science; dynamic processes of biogeography; influence of humans as a biogeographically formative force; endemism; vicariance; adaptive radiation; invasion, migration etc.		5 C
Course: Evolution und Biogeografie (Exercise)		3 WLH
Admission requirements: none	Recommended previous knowledge: none	
Language:	Person responsible for module:	

German	Prof. Dr. Christoph Bleidorn
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 3
Maximum number of students: 30	
Additional notes and regulations: The final grade can be either the result of the written examination or the result of the oral presentation together with the written report.	

Georg-August-Universität Göttingen		6 C
Module B.Biodiv.333: Plant ecology		10 WLH
Learning outcome, core skills: Introduction to basics of plant ecology (aut- and synecology). Introduction to basics of ecological habitat science through excursions to different beech forest locations around Göttingen and microclimate measurements on the terrain of the experimental botanical garden. Introduction to ecophysiological measurement methods for water and carbon balance of various tree species in the treetop path of the experimental botanical garden and determination of ecologically important leaf and root morphological characteristics.		Workload: Attendance time: 140 h Self-study time: 40 h
Course: Spezielle Pflanzenökologie (Lecture)		2 WLH
Course: Wald- und Baumökologie (Exercise)		8 WLH
Examination: Written examination (60 minutes) Examination prerequisites: regelmäßige Teilnahme an den Übungen Examination requirements: Autecological basic knowledge of plant-soil and plant-atmosphere interactions; basic knowledge of water and carbon balance of indigenous tree species. Anatomical and morphological characteristics of roots, sprouts and leaves as an adaptation to specific habitat conditions. Soil and vegetation characteristics of beech forests in the surrounding of Göttingen.		6 C
Admission requirements: General admission requirements for modules of the second study section (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: Dr. Dietrich Hertel	
Course frequency: each summer semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 6	
Maximum number of students: 30		

Georg-August-Universität Göttingen Module B.Biodiv.334: Animal ecology	6 C 9 WLH
Learning outcome, core skills: Upon successful completion of the module, the students have gained basic competences and practical experiences with: <ul style="list-style-type: none"> • occurrence, diversity, systematics and ecology of terrestrial invertebrates • development of a specific, realistic, and testable hypothesis • demonstration of scientific thought processes and their results • recognizing the environmental factors that may affect biodiversity • methods for collecting and identifying domestic invertebrates with focus on Arthropoda • methods for the determination of ecological niches of indigenous invertebrates • uncomplicated statistical analysis and graphical presentation of data • preparation of a scientific manuscript • function and exercise of the "peer review" process • formal and informal presentation of their own scientific work. 	Workload: Attendance time: 126 h Self-study time: 54 h
Course: Tierökologie – Soil Animal Ecology (Exercise)	9 WLH
Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: oral presentation of the results of the practical work (ca. 15 minutes) Examination requirements: Deepened knowledge in the field of animal ecology, particularly in population ecology, interaction of populations (biosystems), ecosystem processes, diversity, structure of animal communities. The focus of the requirements lies on the ecology of terrestrial invertebrates.	6 C
Admission requirements: General admission requirements for modules of the second study section (see PStO)	Recommended previous knowledge: none
Language: English	Person responsible for module: Prof. Dr. Mark Maraun
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5
Maximum number of students: 20	

Georg-August-Universität Göttingen		6 C 10 WLH
Module B.Biodiv.339: Vegetation ecology: Woodlands		
<p>Learning outcome, core skills: The practical course includes the vegetation scientific analysis and evaluation of a study area near Göttingen. It provides basic knowledge of phytosociological data collection in the field (biological-ecological characteristics of the flora, recording techniques, indicator value analysis, gradient analysis, methods of vegetation scientific monitoring, vegetation mapping) and data processing including the generation of vegetation tables. The focus lies on different forest communities. In addition, the participants will deepen their knowledge of species and practice the identification of plants by vegetative characteristics. The participants prepare (group) protocols. The course will be accompanied by thematic introductions (lectures) and analytical ad hoc seminars. The following topics are introduced theoretically and methodically and worked on independently under supervision:</p> <ul style="list-style-type: none"> • species areal analysis • sample area choice for vegetation mapping, generation of vegetation records • acquisition of vegetation/habitat gradient data, transect and frequency analysis • types of life and growth form, structural vegetation classification • indicator value of species and plant communities • working with tables, floristic-sociological classification, preparation of mapping keys • interpretation of aerial images for geobotanical questions • structural-physiognomic and floristic-sociological vegetation mapping 		<p>Workload: Attendance time: 140 h Self-study time: 40 h</p>
<p>Course: Vegetation ecology: Introduction to Vegetation ecology (Lecture) <i>Course frequency: each winter semester</i></p>		1 WLH
<p>Course: Vegetation ecology: Spezielle Vegetationsökologie - Mitteleuropa (Lecture) <i>Course frequency: each winter semester</i></p>		1 WLH
<p>Course: Vegetationsökologie: Wälder (Exercise) <i>Course frequency: each summer semester</i></p>		8 WLH
<p>Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: Kurzvorträge (ca. 30 Min.) Examination requirements: The students prepare an individual protocol according to conventional scientific standards including their classification results in a sorted synoptic table, interpretation and assignment of vegetation units and the mapping key; in group protocols the students present their generated species lists, tables, charts and vegetation maps.</p>		6 C
<p>Admission requirements: General admission requirements for modules of the second study section (see PStO)</p>	<p>Recommended previous knowledge: basics knowledge of botanical species</p>	
<p>Language:</p>	<p>Person responsible for module:</p>	

German	Prof. Dr. Erwin Bergmeier Inga Schmiedel, Florian Goedecke
Course frequency: lectures each WiSe, exercise each SoSe	Duration: 2 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6
Maximum number of students: 16	

Georg-August-Universität Göttingen		6 C
Module B.Biodiv.340: Conservation biology		10 WLH
<p>Learning outcome, core skills: In this module the students should become familiar with planning instruments from the field of nature conservation and the activity of zoologists in the context of biological baseline surveys. Examples for topics include biotope mapping, maintenance and development plans, nature reserve management, environmental compatibility assessment as well as species conservation legal inspection within the frame of guidelines of national and international nature conservation law (Habitats Directive, Birds Directive, Federal Nature Conservation Act). The introduction for the practical work is given in the lecture (Nature conservation). During the practical course (Biodiversity and nature conservation), the students should deal in a practical way with the faunistics and ecology of relevant groups of species. The practical course takes place in form of excursions (in part over several days) to various natural environments in Germany and in the classroom. The students acquire and analyze their own data and discuss existing data in a nature conservation scientific manner. The practical course also offers the possibility of dealing with geospatial information.</p>		<p>Workload: Attendance time: 140 h Self-study time: 40 h</p>
Course: Nature conservation (Lecture)		2 WLH
Course: Biodiversity and conservation (Exercise)		8 WLH
<p>Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: regelmäßige Teilnahme an den Übungen Examination requirements: As part of the practical course, the students prepare a protocol which gives an overview of the topics, issues, methods and results of each course day.</p>		6 C
<p>Admission requirements: General admission requirements for modules of the second study section (see PStO)</p>	<p>Recommended previous knowledge: none</p>	
<p>Language: German</p>	<p>Person responsible for module: Prof. Dr. rer. nat. Matthias Waltert</p>	
<p>Course frequency: each summer semester</p>	<p>Duration: 1 semester[s]</p>	
<p>Number of repeat examinations permitted: twice</p>	<p>Recommended semester: 6</p>	
<p>Maximum number of students: 24</p>		

Georg-August-Universität Göttingen		6 C 8 WLH
Module B.Biodiv.341: Palynology and palaeoecology		
Learning outcome, core skills: Acquisition of basic knowledge of vegetation history, climate and settlement history of different regions of the world and of palaeoecology and dendrochronology. Acquisition of essential basic knowledge of pollen morphology, in particular the methods of pollen analysis, macro remnant analysis and dendrochronology and their possible applications. Understanding of the relations of vegetation, climate, environment and humans in space and time. Practical application of methods for the acquisition of environmental archives in the field and in the laboratory.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Vegetationsgeschichte Europas (Lecture) <i>Course frequency: each summer semester</i>		1 WLH
Course: Vegetationsgeschichte außereuropäischer Länder (Lecture) <i>Course frequency: each summer semester</i>		1 WLH
Course: Einführung in die Paläoökologie (Lecture) <i>Course frequency: each winter semester</i>		1 WLH
Course: Palynologie, Vegetationsgeschichte, Dendrochronologie (Exercise) <i>Course frequency: each winter semester</i>		5 WLH
Examination: written report (ca. 10 pages and 10-15 drawings of pollen and spore types) Examination prerequisites: regelmäßige Teilnahme an den Übungen Examination requirements: Knowledge of methods of pollen and macro remnant analysis; basic knowledge of dendrochronology. Giving examples for the application of dendrochronology. Definition of environmental archives and their acquisition.		6 C
Admission requirements: General admission requirements for modules of the second study section (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: Prof. Dr. Hermann Behling	
Course frequency: not specified 341-1 and 341-2 each SoSe, 341-3 and 341-4 each WiSe	Duration: 2 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6	
Maximum number of students: 15		

Georg-August-Universität Göttingen		6 C 7 WLH
Module B.Biodiv.342: Scientific methods and project management		
Learning outcome, core skills: The students learn important aspects of scientific working in theory (e.g formation of hypotheses, falsification of scientific statements, scientific argumentation, causal analysis etc.) and in practice (use of equipment and instruments, methods of analysis, error analysis etc.) as well as forms of scientific communication, publication and quality assurance. They become acquainted with the basics for scientific project management, in particular review and assessment of scientific literature, design of experiments, forms of evaluation and presentation of results, presentation of scientific results and self-organization including time management. Students are familiarized with the principles and (DFG) guidelines for "good scientific practice"		Workload: Attendance time: 98 h Self-study time: 82 h
Course: Gute wissenschaftliche Praxis (Exercise)		1 WLH
Course: Methoden- und Projektmanagement (Exercise)		6 WLH
Examination: Oral examination (approx. 30 minutes) Examination requirements: Presentation of the concept for the Bachelor thesis and its practical execution including a time schedule. Knowledge of the current state of research and the methods to be applied for testing the scientific question.		6 C
Admission requirements: all introductory and basic modules of the first study period	Recommended previous knowledge: none	
Language: German	Person responsible for module: PD Dr. Dirk Gansert	
Course frequency: each semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 6	
Maximum number of students: not limited		

Georg-August-Universität Göttingen		8 C
Module B.Biodiv.343: Internship		
Learning outcome, core skills: The internship lasts at least six weeks and is carried out at a non-university institution whose activity profile is thematically related to the educational objectives of the course of study. The aim of the internship is to give the students insight into the professional practice of working areas that deal with the conservation and protection of biodiversity and the knowledge in this field. The students should collect practical experience in the professional world in order to understand the process of implementation of scientific knowledge and the appropriate lines of action for the appreciation and conservation of biodiversity in practice. Since the transfer from science into practice varies highly between different professional fields - from youth and adult education to environmental technology, from science journalism to management of national parks, from nature conservation authority to international nature conservation organizations etc - the students should acquire practical skills in work areas of their choice. The focus is to provide the students with an insight into the self-conception, the objective and the scope of work of such an institution and with the ability for a critical assessment between theory and practice, expectations and reality.		Workload: Attendance time: 0 h Self-study time: 240 h
Examination: written report (max. 15 pages), not graded Examination requirements: The report contains information on the objectives, structure, scopes of work etc. of the institution in which the internship was carried out as well as information on activities carried out by the student during the internship. The report concludes with a critical final review and reflection on the executed activities and the host institution.		8 C
Admission requirements: none	Recommended previous knowledge: none	
Language: German	Person responsible for module: PD Dr. Dirk Gansert	
Course frequency: each semester during lecture free time	Duration: 1 semester[s]	
Number of repeat examinations permitted: once	Recommended semester: 4	
Maximum number of students: not limited		

Georg-August-Universität Göttingen		6 C 7 WLH
Module B.Biodiv.355: Methods of systematic botany I		
Learning outcome, core skills: The students acquire basic knowledge of the methodology of plant systematics and evolution (pro- and eukaryotic algae, fungi and terrestrial plants). This includes the processing of molecular systematic data sets (DNA sequence analysis, DNA barcoding, DNA fingerprinting) and the acquisition of karyological techniques (chromosome counting, flow cytometry) for the study of evolutionary questions. The students are able to form a hypothesis for systematic botany and evolutionary research, to apply appropriate methods for their study and to present the results of their work by giving a talk and writing a protocol.		Workload: Attendance time: 98 h Self-study time: 82 h
Course: Methoden der Pflanzensystematik und Karyologie (Seminar)		1 WLH
Course: Methoden der Pflanzensystematik und Karyologie (Lecture)		1 WLH
Course: Systematik I: Biosystematik der Pflanzen (Exercise)		5 WLH
Examination: Minutes / Lab report (max. 12 pages) Examination prerequisites: oral presentation of results and literature from one topic (ca. 10 minutes) Examination requirements: Molecular systematic and karyological processing of selected algae and terrestrial plants.		6 C
Admission requirements: B.Bio.127 General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: Prof. Dr. Elvira Hörandl	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5	
Maximum number of students: 30		

Georg-August-Universität Göttingen Module B.Biodiv.357: Analysis methods and experiments related to the diversity of algae and cyanobacteria	6 C 8 WLH
Learning outcome, core skills: The students acquire deepened knowledge of analysis methods for evaluating experiments on the growth of algae and cyanobacteria. This includes spectrophotometric measurement methods for cell density, absorption spectra for the detection of carotenoids as well as fluorescence microscopy for the detection of lipid inclusions. The students are able to perform growth experiments under different growth parameters (such as N-content of growth media, CO ₂ addition, temperature and light) independently and to document and interpret the growth with growth curves. In addition, the students gain advanced knowledge of molecular analyses (for example DNA sequencing and cloning, AFLP fingerprints) to characterize isolates of algae in greater detail and to test for possible contaminations. Furthermore, microbiological techniques are taught to establish new isolates of algae from environmental samples.	Workload: Attendance time: 112 h Self-study time: 68 h
Course: Analysemethoden und Experimente zur Diversität von Algen und Cyanobakterien (Seminar)	1 WLH
Course: Analysemethoden und Experimente zur Diversität von Algen und Cyanobakterien (Exercise)	5 WLH
Course: Geländearbeit zum Etablieren neuer Algenisolate (Excursion)	2 WLH
Examination: Minutes / Lab report (max. 12 pages) Examination prerequisites: regelmäßige Teilnahme an den Übungen Examination requirements: Independent work on a research topic that involves growth experiments with algae or the detailed characterization of isolates of algae including analysis, interpretation and discussion of the results in an oral presentation.	6 C
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none
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	
Additional notes and regulations:	

The module offers the choice between two orientations: Growth experiments with algae in the context of the biotechnological utilization of algae *or* mainly molecular determination of algal diversity in certain environmental samples

Georg-August-Universität Göttingen Module B.Biodiv.358: Methods of systematic botany II: Evolution of flowering plants	6 C 6 WLH
Learning outcome, core skills: The students acquire deepened knowledge of the methodology of systematic botany and evolution research. The students are able to perform the sample collection, data acquisition, relevant statistical analysis and presentation of their results on a topic of their choice. The following topics are available: population genetic studies using DNA fingerprinting; investigation of polyploidy complexes by chromosome counting and flow cytometry; experimental reproductive biology by microscopy and flow cytometry; molecular phylogenetics and historical biogeography using DNA sequencing. The module should be used for preparatory work for a Bachelor thesis. The practical course takes place "on the bench" with individual supervision and time management, if applicable in small groups, until completion of the topic.	Workload: Attendance time: 84 h Self-study time: 96 h
Course: Methoden der Systematischen Botanik II (Seminar)	1 WLH
Course: Methoden der Systematischen Botanik II (Exercise)	5 WLH
Examination: Minutes / Lab report (max. 12 pages) Examination prerequisites: regelmäßige Teilnahme an den Übungen Examination requirements: Independent work on a research topic from the field of evolution of flowering plants including sample collection, data acquisition, analysis and presentation of results.	6 C
Admission requirements: B.Biodiv.355 General admission requirements for modules of the second study period (see PStO)	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: once	Recommended semester: 6
Maximum number of students: 12	

Georg-August-Universität Göttingen		6 C 8 WLH
Module B.Biodiv.360: Climate warming and vegetation		
Learning outcome, core skills: The students acquire deepened knowledge of the extent of global warming, its timing and regional differences. They have advanced knowledge of the causes of global warming and its spatial and temporal variability as well as its impact on the vegetation in the major vegetation zones of the earth. In the practical course the students learn selected methods from work areas where scientists with biological background work on the study of global warming and its effects. These include the analysis of climate data and growth trends of trees (age ring analysis) as well as the comparative accounting of carbon stocks of ecosystems.		Workload: Attendance time: 112 h Self-study time: 68 h
Course: Klimaerwärmung und Vegetation (Lecture)		2 WLH
Course: Fallstudien zur Klimaerwärmung (Seminar)		1 WLH
Course: Analyse von Klimatrends und Kohlenstoffbilanzen (Exercise)		5 WLH
Examination: Schriftlicher Bericht (max. 10 pages) Examination prerequisites: regular participation in the tutorials Examination requirements: The students are supposed to present and discuss a current topic related to global warming and its effects on ecosystems in an oral presentation based on selected primary scientific papers.		6 C
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: Dr. Martyna Kotowska	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5	
Maximum number of students: 20		

Georg-August-Universität Göttingen		6 C 6 WLH
Module B.Biodiv.365: Statistics - basics and applications in ecology		
Learning outcome, core skills: The students <ul style="list-style-type: none"> • acquire basic knowledge in descriptive and interference statistics and their applications in ecology; • learn statistical data evaluation with “R” and its application to examples from the environmental practice: linear regression, ANOVA, ANCOVA, multiple regression, generalized linear models (GLM); • learn various biodiversity dimensions and indices; • learn the execution of biodiversity analyses by selecting biodiversity dimensions for a given application, calculating and interpreting scientifically. 		Workload: Attendance time: 84 h Self-study time: 96 h
Course: Grundlagen der Statistik (Lecture, Exercise)		2 WLH
Course: Statistik mit 'R' in der Ökologie (Lecture, Exercise)		2 WLH
Course: Statistik in der Biodiversitätsforschung (Lecture, Exercise)		2 WLH
Examination: Written examination (90 minutes) Examination prerequisites: regular participation in the exercise Examination requirements: Application of statistical methods and data processing with “R”; knowledge of biodiversity dimensions and indices and their application, calculation and interpretation.		6 C
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: PD Dr. Dirk Gansert Dr. Katrin Meyer	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: 5	
Maximum number of students: 20		

Georg-August-Universität Göttingen		6 C 8 WLH
Module B.Biodiv.370: Molecular zoology: Topics and methods		
<p>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.</p> <p>Learning outcome:</p> <ul style="list-style-type: none"> • 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 <p>After completing the module, the students should be able to:</p> <ul style="list-style-type: none"> • 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. 		<p>Workload: Attendance time: 112 h Self-study time: 68 h</p>
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
<p>Examination: Lecture (approx. 30 minutes) Examination prerequisites: regular participation in the exercise Examination requirements: Understanding and scientific presentation of topics of molecular zoology in a talk (20 minutes) followed by a discussion (about 10 minutes).</p>		6 C
<p>Admission requirements: General admission requirements for modules of the second study period (see PStO)</p>	<p>Recommended previous knowledge: none</p>	
<p>Language: German</p>	<p>Person responsible for module: Prof. Gregor Bucher</p>	

Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5
Maximum number of students: 20	

Georg-August-Universität Göttingen Module B.Biodiv.375: Geographic Information Systems (GIS) in biodiversity research	6 C 8 WLH
Learning outcome, core skills: The students gain basic knowledge of geographic information systems (GIS; in the course "ESRI ArcGIS for Desktop"). They acquire the necessary background knowledge in a lecture and using supervised and independent computer exercises. Students acquire knowledge and skills regarding <ul style="list-style-type: none"> • GIS projects, • projections and coordinate systems, • data management (raster and vector data) • acquisition of their own data in the field (GPS) • digitization, • spatial analysis, and • generation of scientific maps. The module focuses on vegetation-ecological and land use data, however, the methods taught might as well be applied to other research fields	Workload: Attendance time: 112 h Self-study time: 68 h
Course: Theoretische Hintergründe zur Arbeit mit Geografischen Informationssystemen (Lecture)	2 WLH
Course: GIS-Anwendungen mit Beispielen aus der Praxis (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 15 pages) Examination prerequisites: regular participation in the course Examination requirements: Basic knowledge of the use of Geographical Information Systems (in particular "ESRI ArcGIS for Desktop"): generation and management of projects, coordinate systems, GIS analyses, layout options.	6 C
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none
Language: German	Person responsible for module: Dr. Inga Schmiedel
Course frequency: each winter semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5
Maximum number of students: 40	

Georg-August-Universität Göttingen Module B.Biodiv.380: Urban ecology and biodiversity	6 C 8 WLH
Learning outcome, core skills: The students get an introduction to the theory and practice on the ecology and biodiversity of urban agglomerations and their interactions with the structural features of such agglomerations in international comparison. They acquire knowledge and skills for the characterization and evaluation of agglomerations as anthropogenically influenced ecosystems and their qualitative changes as an expression of the way of life on the historic scale. The students get to know strategies and concepts for ecological design of modern urban settlements and interrelate these examples with the existing local practice – for example in Göttingen - in selected project topics. The module focuses on the interfaces between urban biosphere including neophytes and neozoons and the urban bioclimate, the urban pedosphere and the urban hydrosphere. The biosphere as a structural vivid component is examined and questioned referring to its potential and its limits to increase urban quality of life in case studies. In addition, the students acquire skills for the adaption of urban settlements to climate change and the resulting change in the diversity and quality of life.	Workload: Attendance time: 112 h Self-study time: 68 h
Course: Ökologie und Biodiversität urbaner Ballungsräume (Lecture)	2 WLH
Course: Strategien und Konzepte zur ökologischen Gestaltung urbaner Ballungsräume (Exercise, Seminar)	6 WLH
Examination: Minutes / Lab report (max. 20 pages) Examination prerequisites: regular participation in the course Examination requirements: As part of the practical course, the students prepare a protocol which examines the aspects of urban ecology and biodiversity and their impact on and interaction with different system functions of an urban agglomeration by use of a case study and critically questions the difference between theory and practice upon selected criteria.	6 C
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: knowledge of species; basics of ecology and biodiversity
Language: German	Person responsible for module: PD Dr. Dirk Gansert
Course frequency: each summer semester	Duration: 1 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 6
Maximum number of students: 24	

<p>Georg-August-Universität Göttingen</p> <p>Module B.Biodiv.390: Vegetation ecology: Urban and riparian systems</p>	<p>6 C 10 WLH</p>
<p>Learning outcome, core skills:</p> <p>The lectures in the winter semester convey basics of vegetation ecology and geobotany and give a plant sociological-ecological overview over the vegetation of Central Europe. The three-week course in the summer semester provides an introduction into vegetation sampling, analyses, and interpretation of the results. Short-term dynamic processes in the vegetation are recorded and their effects are evaluated. Methodical competences include sampling techniques and vegetation mapping, numerical analyses of vegetation plots, vegetation-ecological and success monitoring of measures shaping the environment. Furthermore, knowledge of the adaptation of plants to floodplain habitats is obtained and the spectrum of plant communities in urban habitats is presented. Knowledge about plant species and their traits is deepened. The restored part of the Leine river in Göttingen and its tributaries and standing waters in the surrounding are used as exemplary cases. The course is accompanied by lectures and seminars.</p> <p>Following aspects are discussed in detail:</p> <ul style="list-style-type: none"> • restoration of riparian systems • EU Water Framework Directive • ecological indicators (aquatic macrophytes, Ellenberg Indicator Values) • hemeroby • biotope mapping of floodplains and water bodies • neophytes in urban areas • problems of landscape planning/urban planning and conflicts with nature conservation. 	<p>Workload:</p> <p>Attendance time: 140 h</p> <p>Self-study time: 40 h</p>
<p>Course: Fundamentals of vegetation ecology (Lecture) <i>Course frequency: each winter semester</i></p>	<p>1 WLH</p>
<p>Course: Vegetation ecology and plant communities of Central Europe (Lecture) <i>Course frequency: each winter semester</i></p>	<p>1 WLH</p>
<p>Course: Methods in vegetation ecology: Dynamics of the Leine floodplain in Göttingen (Exercise) <i>Course frequency: each summer semester</i></p>	<p>8 WLH</p>
<p>Examination: Minutes / Lab report (max. 15 pages)</p> <p>Examination prerequisites: regular participation in the course and short presentation (ca. 30 minutes)</p> <p>Examination requirements: The students prepare an individual protocol including the presentation of their classification results in an ordered synoptic table, interpretation of vegetation units and biotope mapping. Additionally, the students give short oral presentations.</p>	<p>6 C</p>
<p>Admission requirements:</p>	<p>Recommended previous knowledge:</p>

General admission requirements for modules of the second study period (see PStO)	basics of plant identification
Language: German	Person responsible for module: Prof. Dr. Erwin Bergmeier Inga Schmiedel, Florian Goedecke
Course frequency: lectures each WiSe, exercise each SoSe	Duration: 2 semester[s]
Number of repeat examinations permitted: twice	Recommended semester: 5 - 6
Maximum number of students: 24	

Georg-August-Universität Göttingen		6 C
Module B.Biodiv.395: Methods of systematic zoology		9 WLH
Learning outcome, core skills: The students get an overview of morphological and molecular methods in systematics. As an example, all studies on annelids and / or insects and / or plathelminthes are carried out and an introduction to the biology and taxonomy of these groups is part of the course. Microscopic techniques and their preparation are taught in morphology. The main focus of molecular biological methods is on DNA extraction and PCR. A computer-assisted evaluation of morphological and molecular data is presented.		Workload: Attendance time: 126 h Self-study time: 54 h
Course: Methods of systematic zoology (Lecture)		1 WLH
Course: Methods of systematic zoology (Exercise)		8 WLH
Examination: Written examination (90 minutes) Examination prerequisites: oral presentation (of current scientific publication)		6 C
Examination requirements: Fundamentals of biology and taxonomy of selected animal groups, understanding of the methodology of zoological systematics.		
Admission requirements: General admission requirements for modules of the second study period (see PStO)	Recommended previous knowledge: none	
Language: German	Person responsible for module: Prof. Dr. Christoph Bleidorn	
Course frequency: each winter semester	Duration: 1 semester[s]	
Number of repeat examinations permitted: twice	Recommended semester: from 5	
Maximum number of students: 20		

Georg-August-Universität Göttingen		6 C
Module B.Che.1201: Introduction to Organic Chemistry		5 WLH
Learning outcome, core skills: Nach erfolgreicher Absolvierung des Moduls sollte die bzw. der Studierende <ul style="list-style-type: none"> • 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		4 C 4,5 WLH
Module B.Che.7408: Laboratory course in General and Inorganic Chemistry for Biologists		
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) <i>Course frequency: jedes Sommersemester (halbsemestrig)</i>		6 WLH
Course: Seminar zum Chemischen Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie (Seminar) <i>Course frequency: jedes Sommersemester (halbsemestrig)</i>		2 WLH
Course: Begleitvorlesung zum chemischen Praktikum für Studierende der Biologie - Allgemeine und Anorganische Chemie (Lecture) <i>Course frequency: jedes Sommersemester (halbsemestrig)</i>		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		4 C 4,5 WLH
Module B.Che.7409: Laboratory course in General and Organic Chemistry for Biologists		
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 spektroskopischen 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) <i>Course frequency: jedes Wintersemester (halbsemestrig)</i>		6 WLH
Course: Seminar zum Chemischen Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie (Seminar) <i>Course frequency: jedes Sommersemester (halbsemestrig)</i>		2 WLH
Course: Begleitvorlesung zum chemischen Praktikum für Studierende der Biologie - Allgemeine und Organische Chemie (Lecture) <i>Course frequency: jedes Wintersemester (halbsemestrig)</i>		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	
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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		10 C 7 WLH
Module B.Che.8002: Introduction to Physical Chemistry for Biology and Geosciences		
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 Gleichgewicht und EMK, formale Kinetik, Enzymkinetik, Arrhenius-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		6 C 4 WLH
Module B.Mat.0811: Mathematical foundations of biology		
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: <ul style="list-style-type: none"> • Dozent/in: Lehrpersonen des Mathematischen Instituts • Export-Modul für den Bachelor-Studiengang "Biologie" 		

Georg-August-Universität Göttingen		6 C 6 WLH
Module B.Phy-NF.7002: Experimental Physics for Biology Students		
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		4 C
Module B.Phy-NF.7004: Physics Lab for Non-Physics Students		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 <i>oder</i> 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 SK.FS.EN-FN-C1-1: Scientific English I	6 C (incl. key comp.: 6 C) 4 WLH
<p>Learning outcome, core skills: Weiterentwicklung bereits vorhandener diskursiver Fertigkeiten und Kompetenzen auf einem über die Stufe B2 des <i>Gemeinsamen europäischen Referenzrahmens für Sprachen</i> hinausgehenden Niveau, mit Hilfe derer auch jede Art von beruflicher und naturwissenschaftlicher Sprachhandlung auf Englisch vollzogen werden kann, wie z.B.:</p> <ul style="list-style-type: none"> • 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. 	<p>Workload: Attendance time: 56 h Self-study time: 124 h</p>
<p>Course: Scientific English I (Exercise) <i>Contents:</i></p> <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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 <p>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.</p>	4 WLH
<p>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:</p>	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 <i>Gemeinsamen europäischen Referenzrahmens für Sprachen</i> 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		