

Modulverzeichnis

Bachelor's degree programme "Molecular Ecosystem Sciences" (supplement to the examination and study regulations for the Bachelor's degree programme published in Amtliche Mitteilungen I 17/2015 p. 235)

Module

B.MES.101: Molecular plant and stress physiology.....	1112
B.MES.102: Chemical ecology.....	1113
B.MES.103: Ecological genetics.....	1114
B.MES.104: Biotic and abiotic interactions.....	1115
B.MES.106: Microbiology and molecular biology.....	1116
B.MES.107: Ecological modelling.....	1117
B.MES.108: Computer science and mathematics.....	1118
B.MES.109: Plant ecology and diversity.....	1119
B.MES.111: Terrestrial biogeochemistry.....	1120
B.MES.112: Environmentally friendly production of wood.....	1121
B.MES.113: Methods in systems biology.....	1122
B.MES.114: Biodiversity of pro- and eukaryotic soil microbial communities.....	1123
B.MES.116: Conservation and ecosystem management.....	1124
B.MES.117: Atmosphere-ecosystem interactions.....	1125
B.MES.118: Resource assessment in ecosystems.....	1126
B.MES.119: Isotopes in ecosystem sciences.....	1128
B.MES.121: Global change.....	1129
B.MES.122: Molecular soil ecology.....	1130
B.MES.123: Project (research participation).....	1131
B.MES.301: Special topics in plant methods and ecological applications I.....	1132
B.MES.302: Special topics in plant methods and ecological applications II.....	1133
B.MES.303: Semiochemical diversity.....	1134
B.MES.304: Protection of renewable resources.....	1135
B.MES.305: Conservation of biodiversity.....	1136
B.MES.306: Intraspecific diversity of plants.....	1137
B.MES.307: Research practicum.....	1138
B.MES.308: Scientific project.....	1139
B.MES.309: Practical training in laboratory techniques.....	1140
B.MES-SK.105: Laboratory techniques.....	1141

B.MES-SK.110: The science-policy interface: society and research structures.....	1142
B.MES-SK.115: Scientific methods and project design.....	1143
SK.FS.EN-FF-C1-1: Scientific Writing in English - C1.1.....	1144

Übersicht nach Modulgruppen

I. Bachelor's degree programme "Molecular Ecosystem Sciences"

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

1. Compulsory Modules in the field of Molecular Ecosystem Sciences

The 19 following modules comprising 114 Credits must be successfully completed.

B.MES.101: Molecular plant and stress physiology (6 C, 4 SWS).....	1112
B.MES.102: Chemical ecology (6 C, 4 SWS).....	1113
B.MES.103: Ecological genetics (6 C, 4 SWS).....	1114
B.MES.104: Biotic and abiotic interactions (6 C, 4 SWS).....	1115
B.MES.106: Microbiology and molecular biology (6 C, 4 SWS).....	1116
B.MES.107: Ecological modelling (6 C, 4 SWS).....	1117
B.MES.108: Computer science and mathematics (6 C, 4 SWS).....	1118
B.MES.109: Plant ecology and diversity (6 C, 4 SWS).....	1119
B.MES.111: Terrestrial biogeochemistry (6 C, 4 SWS).....	1120
B.MES.112: Environmentally friendly production of wood (6 C, 4 SWS).....	1121
B.MES.113: Methods in systems biology (6 C, 4 SWS).....	1122
B.MES.114: Biodiversity of pro- and eukaryotic soil microbial communities (6 C, 4 SWS).....	1123
B.MES.116: Conservation and ecosystem management (6 C, 4 SWS).....	1124
B.MES.117: Atmosphere-ecosystem interactions (6 C, 4 SWS).....	1125
B.MES.118: Resource assessment in ecosystems (6 C, 4 SWS).....	1126
B.MES.119: Isotopes in ecosystem sciences (6 C, 4 SWS).....	1128
B.MES.121: Global change (6 C, 4 SWS).....	1129
B.MES.122: Molecular soil ecology (6 C, 4 SWS).....	1130
B.MES.123: Project (research participation) (6 C, 4 SWS).....	1131

2. Professionalisation

A total of 54 C have to be earned according to the following regulations.

a. Key competencies

The 4 following modules comprising 24 C must be successfully completed.

B.MES-SK.105: Laboratory techniques (6 C, 4 SWS).....	1141
---	------

B.MES-SK.110: The science-policy interface: society and research structures (6 C, 4 SWS).....	1142
B.MES-SK.115: Scientific methods and project design (6 C, 4 SWS).....	1143
SK.FS.EN-FF-C1-1: Scientific Writing in English - C1.1 (6 C, 4 SWS).....	1144

b. Elective modules

A minimum of 5 modules mentioned below comprising at least 30 C must be successfully completed. Modules mentioned below may be substituted with alternative modules according to regulation 2 paragraph 4 of the examination regulations for this degree programme. Save sentence 2, one module may be substituted with any module regarding key competencies in the sense of Regulation 8 a of the General Examination Regulations comprising at least 6 C.

B.MES.301: Special topics in plant methods and ecological applications I (6 C, 4 SWS).....	1132
B.MES.302: Special topics in plant methods and ecological applications II (6 C, 4 SWS).....	1133
B.MES.303: Semiochemical diversity (6 C, 4 SWS).....	1134
B.MES.304: Protection of renewable resources (6 C, 4 SWS).....	1135
B.MES.305: Conservation of biodiversity (6 C, 4 SWS).....	1136
B.MES.306: Intraspecific diversity of plants (6 C, 4 SWS).....	1137
B.MES.307: Research practicum (6 C, 4 SWS).....	1138
B.MES.308: Scientific project (12 C, 3 SWS).....	1139
B.MES.309: Practical training in laboratory techniques (18 C, 4 SWS).....	1140

3. Bachelor's thesis

A total of 12 C are awarded for successfully completing the Bachelor's thesis.

Georg-August-Universität Göttingen Modul B.MES.101: Molecular plant and stress physiology <i>English title: Molecular plant and stress physiology</i>		6 C 4 SWS
Lernziele/Kompetenzen: In this course the students will learn how a plant functions at the cell, tissue and whole-plant level. The contents of the lectures encompass basic cell biology and plant physiology (nutrient uptake, and transport process, photosynthesis, respiration, plant hormones, development and stress adaptation). In the practical courses students will be trained at modern microscopes, will learn the basics of tissue culture, and will obtain practical expertise with the use of ecophysiological methods such as measurements of photosynthesis, fluorescence, water potentials etc.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen: 1. Molecular plant physiology (Lecture) 2. Cell biology, tissue culture and stress responses (Practical course)	2 SWS 2 SWS	
Prüfung: Written exam (120 minutes)	6 C	
Prüfungsanforderungen: Cell compartments and organelles, their structure and function, membrane transport, molecular principles of photosynthesis and respiration, molecular functioning of plant hormones in plant development and stress adaptation, tree biotechnology. Skills: solid theoretical foundation in plant physiology and practical skills in tree regeneration and working under sterile conditions.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: Basic knowledge in biology	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Andrea Polle	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 1	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.102: Chemical ecology <i>English title: Chemical ecology</i>		6 C 4 SWS
Lernziele/Kompetenzen: Students will learn to analyze the molecular basis of plant-insect interactions from the plant and from the insect point of view, based on plant volatiles associated to plant stress correlating with defence status and nutritional value of the plant. They learn how information gained by insect antennae is examined to understand the translation of this information into insect behaviour. Students will learn to assess how sensor-systems on the basis of insect olfaction can be utilized and how chemo-ecological findings can be extended into landscape by an integrative examination of biotic interactions from the molecular to the stand level. This will be the basis for understanding the role of semiochemical diversity in adaptation toward global change and for ecosystem functions and services.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Chemical ecology (Lecture) 2. Exercises in chemical ecology (Laboratory course, seminar)		1 SWS 3 SWS
Prüfung: Oral (ca. 20 minutes)		6 C
Prüfungsanforderungen: Biosynthesis of semiochemicals, signaling pathways, perception of semiochemicals, transduction pathways, physiological action and behavioural activity of semiochemicals, syn- and demecological aspects.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Stefan Schütz	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 1	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.103: Ecological genetics <i>English title: Ecological genetics</i>		6 C 4 SWS
Lernziele/Kompetenzen: Understanding of the importance of intraspecific (genetic) variation for ecosystem processes and functions, in particular <ul style="list-style-type: none"> • knowledge of modern methods to assess genetic diversity in diverse groups of organisms • understanding of the role of the evolutionary factors to shape genetic diversity with emphasis on selection • understanding of evolutionary processes including adaptation under natural conditions and in managed ecosystems • understanding of the impact of global change on genetic resources 		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Ecological genetics (Lecture)		2 SWS
2. Assessment of genetic variation (Laboratory course, workshops)		2 SWS
Prüfung: Oral (ca. 20 minutes)		
Prüfungsanforderungen: Use of modern methods to assess genetic variation in diverse groups of organisms, evolutionary factors and how they shape genetic diversity, the role of adaptation under natural or managed conditions, impact of global change.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Reiner Finkeldey	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 1	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.104: Biotic and abiotic interactions <i>English title: Biotic and abiotic interactions</i>		
Lernziele/Kompetenzen: Interactions between biotic and abiotic components of ecosystems are largely responsible for ecosystem properties and functions. Abiotic interactions will be studied in a submodule focused on the biochemistry of soils; biotic interactions are introduced with a focus on pathogens. Students will be trained to analyze these important ecological interactions at different scales. Significance of soil biochemistry for ecosystem processes will be analyzed based on basic soil properties and chemical principles. Transformations and interactions between solid, liquid, gaseous and living phases in soil will give background for understanding of soils as the main part of terrestrial ecosystems and application of biochemical knowledge from molecular to pedon and field scales. Biotic interactions will be studied at different levels taking into consideration their molecular basis such as genes and their products and with different organisms, plants and/or animals including wildlife.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Soil biochemistry (Lecture, seminar) 2. Biotic interactions in ecology (Lecture, seminar)		2 SWS 2 SWS
Prüfung: Written exam (90 minutes)		6 C
Prüfungsanforderungen: Biochemical processes in soils, weathering and soil formation, biotic drivers, factors of soil formation, soil organisms and decomposition processes, soil organic matter and interactions with clay minerals, molecular basis of biotic interactions, genes and their products, interactions among different organisms.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Yakov Kuzyakov	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 1	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.106: Microbiology and molecular biology <i>English title: Microbiology and molecular biology</i>		
Lernziele/Kompetenzen: Students will be introduced to molecular, biochemical and physiological aspects in microbiology and molecular biology which is important to Ecosystem Sciences. The acquired knowledge allows the students to address questions and problems in Ecology and Systems Biology on molecular levels and understand the background of modern molecular methods that can be applied to solve such topics.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Microbiology and biotechnology (Lecture)	2 SWS	
2. Molecular biology (Lecture)	2 SWS	
Prüfung: Oral (ca. 20 minutes)	6 C	
Prüfungsanforderungen: Basic knowledge on genetics, physiology, and ecology of microorganisms (bacteria and fungi), applications of microorganism in biotechnology generally and with specific focus on ecological tasks, structure and functions of DNA, RNA, proteins and exemplified metabolites, basic concepts and techniques in molecular biology, recombinant DNA technology, DNA transfer techniques, handling of GMOs.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Ursula Kües	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 2	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.107: Ecological modelling <i>English title: Ecological modelling</i>		6 C 4 SWS
Lernziele/Kompetenzen: Comprehensive knowledge of ecological models, theories and concepts. Development of interdisciplinary analytical thinking. Critical analysis and evaluation of the chances and limitations of different modelling approaches.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Ecological modelling (Lecture) <i>Inhalte:</i> Theoretical basics as well as classical and modern models of terrestrial ecology with special consideration of models in microbial ecology.		2 SWS
2. Ecological modelling (Tutorial) <i>Inhalte:</i> Application and analysis of classic and modern ecological models and concepts .		2 SWS
Prüfung: Written exam (90 minutes) Prüfungsvorleistungen: Regular attendance of tutorial		6 C
Prüfungsanforderungen: Comprehensive knowledge of ecological models, theories and concepts. Interdisciplinary analytical thinking skills. Ability to critically analyze and evaluate the chances and limitations of different modelling approaches.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Kerstin Wiegand	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 2	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.108: Computer science and mathematics <i>English title: Computer science and mathematics</i>		6 C 4 SWS
Lernziele/Kompetenzen: Understanding of basic notions and methods of computer science and mathematics, including: representation of information, databases, the World Wide Web, foundations of programming, simulation, visualization; notations from logic and set theory, relations, graphs, functions, differentiation, extreme values, integration; vectors, linear transformations, matrices, eigenvalues; scale levels of variables, measures of location, dispersion and correlation, linear regression, probability, sampling, confidence intervals, fundamentals about statistical testing.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Computer science and mathematics (Lecture) 2. Computer science and mathematics (Exercise)		3 SWS 1 SWS
Prüfung: Written exam (90 minutes) Prüfungsvorleistungen: 60% of points from homework exercises		6 C
Prüfungsanforderungen: Understanding of basic notions and methods of computer science and mathematics, including: databases, WWW, foundations of programming, simulation, visualization; graphs, functions, differentiation, extreme values, integration; vectors, linear algebra; descriptive statistics, linear regression, probability, sampling, simple tests.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Winfried Kurth	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 2	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.109: Plant ecology and diversity <i>English title: Plant ecology and diversity</i>		6 C 4 SWS
Lernziele/Kompetenzen: Students are familiar with global to regional scale patterns of plant diversity, the distribution of major climatic and vegetation zones (ecozones, biomes), as well as their predominant land uses and anthropogenic impacts. Students are familiar with basic aut- and synecological concepts in plant and vegetation ecology from the level of the individual plant to plant communities. They have learned to distinguish different major plant communities in Central Europe and are familiar with their specific abiotic site conditions, and their conservation significance. Students are able to apply ecological field methods and to perform basic analyses of diversity and community structure.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Plant ecology and diversity (Lecture) 2. Plant ecology and diversity (Field studies)		2 SWS 2 SWS
Prüfung: Oral (ca. 20 minutes) Prüfungsvorleistungen: Constant and active participation		6 C
Prüfungsanforderungen: Distribution and determinants of ecozones and biomes, local to global scale patterns of plant diversity, alpha-beta-gamma diversity, aut-and synecological concepts, plant communities and their relations with abiotic site conditions, basic knowledge about field and analysis methods.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Holger Kreft	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 2	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.111: Terrestrial biogeochemistry <i>English title: Terrestrial biogeochemistry</i>		
Lernziele/Kompetenzen: At the end of this course students should understand the major biogeochemical processes at the interface of biosphere, lithosphere hydrosphere and atmosphere. Students will be able to detect where measurements of biogeochemical processes are useful using a system based approach. They will have gained practical experience in relevant measurements of biogeochemical processes in terrestrial ecosystems.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Terrestrial biogeochemistry (Lecture)	2 SWS	
2. Biogeochemical processes (Laboratory course)	2 SWS	
Prüfung: Written examination (120 minutes) and term paper (max. 10 pages)	6 C	
Prüfungsanforderungen: Cycles in biogeochemistry, element ratios, carbon cycle of terrestrial ecosystems, biogeochemical cycling on land, nitrogen cycle of terrestrial ecosystems, soil development, mass balances at different scales, redox reaction in natural environments, biogeochemistry of wetlands, measurements of biogeochemical processes.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Edzo Veldkamp	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 3	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.112: Environmentally friendly production of wood <i>English title: Environmentally friendly production of wood</i>		
Lernziele/Kompetenzen: Environmentally friendly use of timber, of wood for energy and wood products. Basics and practice of wood protection and degradation by fungi. Knowledge of technological relevant wood properties of important commercial timbers. Modification technology for long-living major forest products (lumber, veneer, plywood, wood-based composites) and their significance for forest utilization.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Wood biology (Lecture, exercises, laboratory visits, excursion) <i>Inhalte:</i> Classroom lectures with practical exercises, visits in labs and short presentations of the students, one excursion to a wood processing company.	2 SWS	
2. Wood-based-composites (Lecture, exercises, laboratory visits, excursion) <i>Inhalte:</i> Classroom lectures with practical exercises, visits in labs and short presentations of the students, one excursion to a wood processing company.	2 SWS	
Prüfung: Oral (ca. 20 minutes)	6 C	
Prüfungsanforderungen: Anatomy, wood physics, wood chemistry, wood properties, wood-based composites, wood-plastic composites, wood modification, wood protection.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Holger Militz	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 3	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.113: Methods in systems biology <i>English title: Methods in systems biology</i>		6 C 4 SWS
Lernziele/Kompetenzen: "Omics" techniques are the backbone of modern systems biology. This course comprises lectures and practicals in transcriptomics and metabolomics. The students will learn the theory of these applications, and the functioning of the required hard- and software. The students will obtain practical training in selected methods. This involves lab work as well as computer applications. The learning outcome will be that the students are to apply "omics" methods to questions in ecology and systems biology.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Genomics (Lecture, practicals) 2. Transcriptomics and metabolomics (Lecture, practicals) 3. Proteomics (Lecture, practicals)		1 SWS 2 SWS 1 SWS
Prüfung: Term paper (20 pages max.)		6 C
Prüfungsanforderungen: Detailed knowledge and understanding of all steps of project development, basic experimental designs and methods for their statistical analysis (t-tests, one- and two-factorial anova, regression, nonparametric methods), descriptive statistics and probability distributions, theory of molecular biology and practical skills in laboratory analyses and application of software for metabolomic, proteomic and transcriptomic software. Skills: knowledge how to analyse plant tissues by application of molecular and statistical methods.		
Zugangsvoraussetzungen: B.MES.101, B.MES.103, B.MES.106, B.MES.108	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Andrea Polle	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 3	
Maximale Studierendenzahl: 25		
Bemerkungen: Admission requirements: Successful examination in a minimum of 2 of the following courses: B.MES.101: Molecular plant and stress physiology, B.MES.103: Ecological genetics, B.MES.106: Microbiology and molecular biology, B.MES.108: Computer science and mathematics.		

Georg-August-Universität Göttingen Modul B.MES.114: Biodiversity of pro- and eukaryotic soil microbial communities <i>English title: Biodiversity of pro- and eukaryotic soil microbial communities</i>		6 C 4 SWS
Lernziele/Kompetenzen: Biodiversity, phylogenetics, morphology and functions of soil microbial communities consisting of prokaryotes (archaea, bacteria) and eukaryotes (algae and fungi); diversity of prokaryotic microbial metabolism and environmental functions. Knowledge of prokaryotic microorganisms and algae relevant for environmental functions, ability to identify these organisms and to analyse them with molecular methods; ability to identify major lineages of cyanobacteria and eukaryotic algae from cultures by microscopy.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Biodiversity of pro- and eukaryotic soil microbial communities (Lecture) 2. Biodiversity of pro- and eukaryotic soil microbial communities (Laboratory course)		2 SWS 2 SWS
Prüfung: Protocol (10 pages max.)		6 C
Prüfungsanforderungen: Students prove their ability to perform specific microbiological molecular techniques independently and their ability to record, interpret and present their experimental results in written form.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Rolf Daniel	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 3	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.116: Conservation and ecosystem management <i>English title: Conservation and ecosystem management</i>		
Lernziele/Kompetenzen: The course imparts knowledge about the sustainable management of forest ecosystems and about nature conservation. Based on some fundamentals of forest ecology such as the impact of competitive interactions between trees, options of stand management are presented. Mixed stands and their management are of special importance. The course will provide information on how to analyze forest stands and how to derive appropriate silvicultural treatments in order to achieve the goals set by a given forest owner. The nature conservation part will introduce priority goals of conservation biology, the major threats to natural ecosystems and how they can be managed.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Forest ecosystem management (Lecture)		2 SWS
2. Nature conservation (Lecture)		2 SWS
Prüfung: Written exam (120 minutes)		6 C
Prüfungsanforderungen: Competition in plant communities, plant – environment interactions, mixed stands, principles of stand management, silvicultural systems, human land-use, climate change, biodiversity, ecosystem functioning.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Christian Ammer	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 5	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.117: Atmosphere-ecosystem interactions <i>English title: Atmosphere-ecosystem interactions</i>		6 C 4 SWS
Lernziele/Kompetenzen: In this course students will gain insights in the main atmospheric characteristics and how they influence ecosystem processes and fluxes between ecosystem compounds (e.g. air, plants, soil). They will also learn how ecosystems feed back to the atmosphere at local and global scale. This will form the basis for understanding the impact of climate change on ecosystem functions and services. The lecture course will give an overview on atmospheric variables such as radiation, humidity, temperature, and wind and their interactions with terrestrial ecosystems. In the seminar/exercise class, the understanding will be deepened by quantitative exercises. The students will be trained in quantitative and qualitative scientific methods to describe climate-dependent physical, chemical and biological processes in terrestrial ecosystems enabling them to understand and evaluate the current discussion on climate change and its impact on terrestrial ecosystems.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Atmosphere-ecosystem interactions (Lecture) 2. Atmosphere-ecosystem interactions (Seminar, exercise) (Seminar)		2 SWS 2 SWS
Prüfung: Written exam (120 minutes) Prüfungsvorleistungen: 50% of points from exercises		6 C
Prüfungsanforderungen: Qualitative and quantitative description of radiation, humidity, temperature, wind, their interactions with terrestrial ecosystems, carbon and water cycle, atmospheric chemistry, climate change, climate modelling.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Alexander Knohl	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 5	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.118: Resource assessment in ecosystems <i>English title: Resource assessment in ecosystems</i>		6 C 4 SWS
Lernziele/Kompetenzen: The students will be trained <ul style="list-style-type: none"> to analyse issues and problems of ecological monitoring, with a focus on terrestrial ecosystems, to plan their own monitoring studies on statistically sound grounds balancing scientific-technical objectives and economic feasibility, to critically assess and understand monitoring studies carried out by other. These learning outcomes imply acquiring / enhancing knowledge and skills in the following fields: <ul style="list-style-type: none"> design-based statistical sampling, including estimation design, empirical statistical models, characteristics of a series of sampling designs and plot designs, the systematic planning process in monitoring studies. 		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Resource assessment in ecosystems (Lecture) <i>Inhalte:</i> The lectures comprise the theoretical foundations of monitoring and also the discussion based analysis of cases.		2 SWS
2. Resource assessment in ecosystems (Laboratory course) <i>Inhalte:</i> The field labs are practical exercises in field data collection techniques and measurement devices, the in-house labs are on data analysis and estimation.		2 SWS
Prüfung: Written exam (120 minutes)		6 C
Prüfungsanforderungen: Basics of descriptive and inferential statistics (mean, variance, standard error, confidence interval, bias, precision, random selection), relevant basic sampling design options (simple random, stratified random, systematic, cluster sampling), relevant response designs options (fixed area plots, variable plots, distance techniques, point sampling, line sampling). Statistical estimation. Planning criteria for assessments.		
Zugangsvoraussetzungen: B.MES-SK.115, B.MES.108		Empfohlene Vorkenntnisse: keine
Sprache: Englisch		Modulverantwortliche[r]: Prof. Dr. Christoph Kleinn
Angebotshäufigkeit: jedes Wintersemester		Dauer: 1 Semester
Wiederholbarkeit:		Empfohlenes Fachsemester:

gemäß Prüfungs- und Studienordnung	5
Maximale Studierendenzahl: 25	

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.119: Isotopes in ecosystem sciences <i>English title: Isotopes in ecosystem sciences</i>		
Lernziele/Kompetenzen: The course provides a very broad background for isotope applications in ecosystem compartments including soils, plants, atmosphere, and microorganisms. Overview of various tracer methods and isotope applications will be presented. The specifics of stable and radioactive isotopes for investigations of ecosystem processes from submolecular to global scale will give deep background for future isotope applications in Bachelor, Master and PhD theses.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Stable isotopes (Lecture, seminar with exercises)	2 SWS	
2. Radioactive isotopes and labeling techniques (Lecture, seminar)	2 SWS	
Prüfung: Written exam (90 minutes)	6 C	
Prüfungsanforderungen: Knowledge of specified teaching content, achievement of defined goals and proof of target competence.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Yakov Kuzyakov	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 5	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.121: Global change <i>English title: Global change</i>		6 C 4 SWS
Lernziele/Kompetenzen: At the end of this course the students are expected to <ul style="list-style-type: none"> • have insight in the major components of the earth system and how they are connected, • understand how environmental processes and biogeochemical cycles are regulated by biosphere-hydrosphere-atmosphere feedbacks and how they are affected by global change through natural and anthropogenic processes, • are able to understand and evaluate simple biogeochemical models. 		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Global change (Lecture)		2 SWS
2. Global change (Modelling exercises, seminar, field excursion)		2 SWS
Prüfung: Written exam (120 minutes) Prüfungsvorleistungen: Successful completion of exercises and seminar		6 C
Prüfungsanforderungen: Global water cycle, global carbon cycle, global cycle of nitrogen, phosphorus and sulfur, causes of human-induced global change, modeling problems related to global change, literature research, seminar presentation.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: B.MES.111, B.MES.117	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Edzo Veldkamp	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 6	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.122: Molecular soil ecology <i>English title: Molecular soil ecology</i>		
Lernziele/Kompetenzen: Relationships between genetic diversity of soil organisms and ecological processes will be analyzed in model high throughput laboratory systems. Experiments will be set up allowing to quantify the relative contribution of the identity and diversity of species / genetic lineages for ecosystem processes, such as productivity and decomposition of model substrates. The experiments will form the basis for understanding how decomposer communities respond to environmental stressors such as changes in temperature or exposure to heavy metals. Students will become familiar with molecular technologies used for analyzing the structure and function of decomposer systems, such as quantitative real time PCR, tagging of organisms by fluorescent markers compound specific stable isotope lipid analysis and molecular gut content analysis.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen:		
1. Molecular soil ecology (Laboratory course)		2 SWS
2. Molecular soil ecology (Seminar) (Seminar)		2 SWS
Prüfung: Oral presentation (ca. 15 minutes) with written outline (10 pages max.)		6 C
Prüfungsanforderungen: Knowledge on 1. microbial interactions in soil, 2. functioning of genetic diversity in soil microbial communities, 3. techniques for analyzing soil micro-foodwebs such as quantitative rtPCR, fluorescent labeling, stable isotope and lipid analysis, 4. the response of soil microorganisms to environmental stressors such as temperature and heavy metal.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Stefan Scheu	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 6	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.123: Project (research participation) <i>English title: Project (research participation)</i>		
Lernziele/Kompetenzen: Advanced knowledge of scientific methods and procedures by active participation in a research project conducted by a lecturer of the program. Ability to analyze, interpret and present relevant data.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen:		
1. Project (research participation) (Laboratory courses/work) <i>Inhalte:</i> Laboratory courses/work and/or active participation in ongoing research projects of lecturers involved		3 SWS
2. Project (research participation) (Seminar) (Seminar) <i>Inhalte:</i> Seminar on the own contribution to research		1 SWS
Prüfung: Oral presentation (ca. 15 minutes) with written outline (10 pages max.)		6 C
Prüfungsanforderungen: Scientific hypotheses, experimental design, laboratory techniques, analysis interpretation and scientific presentation of research results.		
Zugangsvoraussetzungen: At least 120 credits earned	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Reiner Finkeldey	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 6	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.301: Special topics in plant methods and ecological applications I <i>English title: Special topics in plant methods and ecological applications I</i>		6 C 4 SWS
Lernziele/Kompetenzen: This elective module consists of a seminar and advanced method courses. In the seminar the students will be informed about recent development and new discoveries in forest botany, plant – microbial interactions, biotechnology, plant molecular genetics and practical applications. In the advanced method courses student undertake internships and/or field excursions to learn new methods and applications in plant physiology and ecology. The students will take responsibility in the organization of their study program.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Forest botany (Seminar) (Seminar) 2. Ecological applications / Field excursion (Lecture, practical)		2 SWS 2 SWS
Prüfung: Oral presentation (ca. 15 minutes) and written report (10 pages max.)		6 C
Prüfungsanforderungen: Discussion of scientific presentations, knowledge in recent problems in Forest Botany, application of advanced scientific methods to selected problems in plant science. Skills: knowledge in critical text analyses and presentation skills, knowledge in data base research, practical skills in handling modern equipment for plant analyses.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: In-depth knowledge in biology is required	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Andrea Polle	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 10		

Georg-August-Universität Göttingen Modul B.MES.302: Special topics in plant methods and ecological applications II <i>English title: Special topics in plant methods and ecological applications II</i>		6 C 4 SWS
Lernziele/Kompetenzen: This elective module consists of a seminar and an advanced method course. The seminar will be conducted as a journal club. The students will get lists of papers which they have to read and present during the semester. The topics will be chosen from recent literature. The goal is to become involved in research and to learn to understand how to structure research and to publish. In the advanced method courses, lectures and specialized techniques will be taught and practiced. The students will organize the journal club.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Advanced plant biochemistry and genetics / Journal club (Seminar) (Seminar) 2. Advanced methods (Lecture, practical)		2 SWS 2 SWS
Prüfung: Oral presentation (ca. 15 minutes) and written report (10 pages max.)		6 C
Prüfungsanforderungen: Reading and analyzing scientific publications, in-depth understanding of scientific working methods in plant ecology and molecular biology. Skills: knowledge in critical text analyses and presentation skills, knowledge in research methods.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: In-depth knowledge in biology is required	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Andrea Polle	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 10		

Georg-August-Universität Göttingen Modul B.MES.303: Semiochemical diversity <i>English title: Semiochemical diversity</i>		6 C 4 SWS
Lernziele/Kompetenzen: Students will learn to investigate the dynamics of semiochemical diversity in different types of ecosystems. This involves field sampling of important plants and animals, volatile extraction from different tissues, laboratory analyses of various types of volatile markers, data analyses and interpretation. Students will learn practical steps to assess semiochemical diversity, and will be able to evaluate the use of chemo-ecological methods for applications in plant protection, nature conservation, and ecosystem management.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Semiochemical diversity (Lecture) 2. Methods to study semiochemical diversity and biodiversity (Workshop, laboratory course)		1 SWS 3 SWS
Prüfung: Term paper (20 pages max.)		6 C
Prüfungsanforderungen: Classification of semiochemicals, measures of chemical and biological diversity, analytical and determination methods, key species, key volatiles, key processes, semiochemicals in practical application.		
Zugangsvoraussetzungen: B.MES.102	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Stefan Schütz	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.304: Protection of renewable resources <i>English title: Protection of renewable resources</i>		6 C 4 SWS
Lernziele/Kompetenzen: The use of chemical methods is commonplace in protection measures at various levels of biological organization in forest protection, plant protection and stored product protection. Students will learn the results of chemo-ecological approaches in integrated pest management based on selected projects and recent literature. Students will be able to critically evaluate benefits and limitations of chemo-ecological approaches in a production and conservation context. Examples will be taken from different geographic and climatic regions.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Protection of renewable resources based on chemical and chemo-ecological methods (Lecture)		1 SWS
2. Assessment of protection measures for renewable resources (Seminar, workshop) (Seminar)		3 SWS
Prüfung: Oral presentation (ca. 15 minutes) with written outline (5 pages max.)		6 C
Prüfungsanforderungen: Application of semiochemicals in different ecosystems, quality control, toxicology, integrated pest management, production of renewable resources, nature protection.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Stefan Schütz	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.305: Conservation of biodiversity <i>English title: Conservation of biodiversity</i>		6 C 4 SWS
Lernziele/Kompetenzen: The use of molecular methods is commonplace in conservation at various levels of biological organization from genes to ecosystems. Students will examine the results of molecular approaches in biodiversity conservation based on selected projects and recent literature. Students will be able to critically evaluate benefits and limitations of molecular studies in a conservation context. Examples will be taken from different geographic and climatic regions.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Conservation of biodiversity based on molecular tools (Lecture) 2. Assessment of molecular diversity for conservation (Seminar, Workshop) (Seminar)		1 SWS 3 SWS
Prüfung: Oral presentation (ca. 15 minutes) with written outline (5 pages max.)		6 C
Prüfungsanforderungen: Effective comprehension of scientific literature with regard to conservation of biodiversity, different methods used for conservation of biodiversity and their specific applications, critical evaluation of molecular studies in a conservation context.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Reiner Finkeldey	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES.306: Intraspecific diversity of plants <i>English title: Intraspecific diversity of plants</i>		
Lernziele/Kompetenzen: Students will learn to investigate the dynamics of intraspecific diversity in different types of ecosystems. This involves field sampling of important plants, DNA extraction from different tissues, laboratory analyses with various types of molecular markers, data analyses and interpretation. Students will learn practical steps to assess genetic diversity, and will be able to evaluate the use of DNA-based methods for applications in breeding, conservation, and ecosystem management.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen:		
1. Intraspecific diversity of plants (Lecture)		1 SWS
2. DNA based methods to study biodiversity (Workshops, laboratory exercise)		3 SWS
Prüfung: Term paper (20 pages max.)		6 C
Prüfungsanforderungen: DNA markers and techniques, estimation of intraspecific diversity in different types of ecosystems, methods used for experimental sampling, DNA extraction from different tissues, laboratory techniques, data analyses and interpretation and application of results.		
Zugangsvoraussetzungen: B.MES.103, B.MES.104	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Reiner Finkeldey	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES.307: Research practicum <i>English title: Research practicum</i>		6 C 4 SWS
Lernziele/Kompetenzen: Students have a possibility to participate in a research work at an institution of their choice (also abroad) to learn new scientific methods and get additional experiences about variety of research topics.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Research practicum (Laboratory courses/work) 2. Research practicum (Seminar)		3 SWS 1 SWS
Prüfung: Term paper (20 pages max.)		6 C
Prüfungsanforderungen: Laboratory methods, analysis, interpretation and scientific presentation of research results. In case of abroad practicum: a confirmation letter from the supervisor with a grade (if possible, in the German grade system)		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Konstantin V. Krutovsky	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		12 C 3 SWS
Modul B.MES.308: Scientific project <i>English title: Scientific project</i>		
Lernziele/Kompetenzen: Advanced knowledge of scientific methods and procedures, and practical skills acquired by active participation in a research project conducted under supervision of a lecturer of the programme at the University of Goettingen or a respective supervisor at a foreign institution. Ability to analyze, interpret and present relevant scientific data. Duration: 6 weeks.		Arbeitsaufwand: Präsenzzeit: 60 Stunden Selbststudium: 300 Stunden
Lehrveranstaltungen:		
1. Scientific project (Laboratory courses/work)		2 SWS
2. Scientific project (Seminar)		1 SWS
Prüfung: Term paper (max. 30 pages)		12 C
Prüfungsanforderungen: Scientific hypotheses, experimental design, laboratory techniques, analysis, interpretation and scientific presentation of research results. In case of abroad practicum: a confirmation letter from the supervisor with a grade (if possible, in the German grade system).		
Zugangsvoraussetzungen: Conducted only together with the module B.MES.309 "Practical training in laboratory techniques". Each student must get an approval from the MES programme's coordinator 3 months before the start of work.	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Konstantin V. Krutovsky	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		18 C 4 SWS
Modul B.MES.309: Practical training in laboratory techniques <i>English title: Practical training in laboratory techniques</i>		
Lernziele/Kompetenzen: Students learn about different research techniques, organization of work in a laboratory and an experiment planning by active participation in a research project conducted under supervision of a lecturer of the programme at the University of Goettingen or a respective supervisor at a foreign institution. Duration: 9 weeks.	Arbeitsaufwand: Präsenzzeit: 90 Stunden Selbststudium: 450 Stunden	
Lehrveranstaltungen: 1. Practical training in laboratory techniques (Laboratory courses/work) 2. Practical training in laboratory techniques (Seminar)	3 SWS 1 SWS	
Prüfung: Laboratory protocol (10 pages max.), unbenotet	18 C	
Prüfungsanforderungen: Experimental design, laboratory techniques, analysis and interpretation of research results. In case of abroad practicum: a confirmation letter from the supervisor with a result.		
Zugangsvoraussetzungen: Conducted only together with the module B.MES.308 "Scientific project". Each student must get an approval from the MES programme's coordinator 3 months before the start of work.	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Konstantin V. Krutovsky	
Angebotshäufigkeit: jedes Sommersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 4	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES-SK.105: Laboratory techniques <i>English title: Laboratory techniques</i>		
Lernziele/Kompetenzen: Students will train in small groups to work in a laboratory. They will be introduced into modern basic and sophisticated methods in the fields of chemistry, biochemistry, microbiology and molecular biology to rules assuring personal and environmental safety and good scientific practice. Students acquire knowledge in experimental planning, technical performance, data interpretation and documentation of practical scientific research.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen:		
1. Organic trace analysis (Seminar, laboratory course, exercises) (Seminar)		2 SWS
2. Inorganic analysis (Seminar, laboratory course, exercises) (Seminar)		1 SWS
3. Microbiology and molecular biology (Laboratory course)		1 SWS
Prüfung: Protocol (20 pages max.)		6 C
Prüfungsanforderungen: Personal and environmental safety, handling and preparation of samples, calibration and use of standards, chromatographic methods, design, performance and documentation of chemical, microbial, and molecular experiments, assessment of results, team work to resolve experimental problems. Handling of radioactive substances, radiation safety, analytics of radioactive isotopes, contaminations with stable and radioactive isotopes .		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Stefan Schütz	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 1	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen Modul B.MES-SK.110: The science-policy interface: society and re- research structures <i>English title: The science-policy interface: society and research structures</i>		6 C 4 SWS
Lernziele/Kompetenzen: Policy of Ecosystems: Knowledge about both: on the one hand the relation between ecosystem sciences and politics and on the other hand about the structure and processes of policy-making. Skills in political consulting and debating. The Research Community: Structure and Organization The scientific community depends on private and public research organizations and funding mechanisms. Students will understand the structure and organization of main institutions conducting or financing research and teaching (universities and large research institutions) in Germany and elsewhere.		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltungen: 1. Policy of ecosystems (Seminar) (Seminar) 2. The research community: structure and organization (Lecture, seminar)		2 SWS 2 SWS
Prüfung: 2 Oral presentations (ca. 10 minutes) with written outline (10 pages max.)		6 C
Prüfungsanforderungen: Current theories of science-policy interface and scientific conditions for knowledge transfer, conditions for application of ecosystem knowledge in society, basics of public policy analysis, research infrastructures, comparison between different research structures. Skills: understanding of the relationship between ecosystem research and actual utilization in society, understanding of the role of different actors in science, planning a research career.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Maximilian Krott	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 2	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul B.MES-SK.115: Scientific methods and project design <i>English title: Scientific methods and project design</i>		
Lernziele/Kompetenzen: Project design comprises all necessary steps to develop a scientific project (literature acquisition, use of libraries, research hypothesis, selection of field sites, selection of methods, statistical considerations, expected outcome, time table) and is closely linked to understanding, application and interpretation of basic terms and results of probability and descriptive and confirmative statistics, such as important discrete and continuous distributions, error propagation, least squares, confidence intervals, testing statistical hypotheses, and basic experimental designs.	Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden	
Lehrveranstaltungen: 1. Research methods (Lecture, exercises)	3 SWS	
2. Project design (Seminar) (Seminar)	1 SWS	
Prüfung: Written exam (60 minutes) and term paper (10 pages max.)	6 C	
Prüfungsanforderungen: Detailed knowledge and understanding of all steps of project development, basic experimental designs and methods for their statistical analysis (t-tests, one- and two-factorial ANOVA, regression, nonparametric methods), descriptive statistics and probability distributions. Involvement in one of the research projects of the department "Soil Science of Temperate Ecosystems", conduction of some analyses and research work, statistical and ecological evaluation of results, presentation on the seminar.		
Zugangsvoraussetzungen: keine	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Prof. Dr. Joachim Saborowski	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: gemäß Prüfungs- und Studienordnung	Empfohlenes Fachsemester: 3	
Maximale Studierendenzahl: 25		

Georg-August-Universität Göttingen		6 C 4 SWS
Modul SK.FS.EN-FF-C1-1: Scientific Writing in English - C1.1		
Lernziele/Kompetenzen: Progression of pre-existing discursive skills and competences at a level above B2 according to the <i>Common European Framework of Reference for Languages</i> , which will enable the student to compose scientific texts in English, particularly in the area of molecular ecosystems sciences, e.g. <ul style="list-style-type: none"> · the skills needed to compose texts for scientific publications utilising specific language structures and conventions, · the acquisition of specific linguistic and stylistic structures in the English language as well as the development of a differentiated scientific vocabulary · the expansion of the operative intercultural knowledge about practices required to write a scientific paper with a focus on molecular ecosystems sciences in an academic context. 		Arbeitsaufwand: Präsenzzeit: 56 Stunden Selbststudium: 124 Stunden
Lehrveranstaltung: Scientific Writing in English (Course)		4 SWS
Prüfung: Portfolio consisting of two tasks of approximately 5 pages each (50 %) and of one task of approximately 10 pages (50 %)		6 C
Prüfungsanforderungen: Proof of linguistic competence in an intercultural and scientific context. Demonstration of the ability to write scientific texts in the English language at a level above B2 according to the <i>Common European Framework of Reference for Languages</i> .		
Zugangsvoraussetzungen: Module Mittelstufe II or placement test with a completed level B2 of the CEFR	Empfohlene Vorkenntnisse: keine	
Sprache: Englisch	Modulverantwortliche[r]: Antonio Gallucci	
Angebotshäufigkeit: jedes Wintersemester	Dauer: 1 Semester	
Wiederholbarkeit: zweimalig	Empfohlenes Fachsemester: 4 - 6	
Maximale Studierendenzahl: 25		
Bemerkungen: Applicable to: Bachelor's Degree Programme „Molecular ecosystem sciences“		