Georg-August-Universität
Göttingen

Directory of Modules

zu der Prüfungs- und Studienordnung für den konsekutiven Master-Studiengang "Biodiversity: Ecology, Evolutiuon, and Conservation" (Amtliche Mitteilungen Nr. 24/2024 S. 528)

Modules

Index by areas of study

I. Master's Degree programme „Biodiversity: Ecology, Evolution, and Conservation“

120 C must be acquired in accordance with the following provisions.
Es müssen nach Maßgabe der nachfolgenden Bestimmungen 120 C erworben werden.

1. Professional studies

Modules totaling at least 78 C must be successfully completed in accordance with the following provisions.
Es müssen Module im Umfang von insgesamt wenigstens 78 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

a. Compulsory Modules

The following compulsory modules totaling 18 C must be successfully completed:
Es müssen folgende Pflichtmodule im Umfang von insgesamt 18 C erfolgreich absolviert werden:

b. Area of specialization

One of the three specializations listed below must be successfully completed with a total of at least 36 C in accordance with the following provisions.
Es muss einer der drei nachfolgend genannten Studienschwerpunkte im Umfang von insgesamt wenigstens 36 C nach Maßgabe der folgenden Bestimmungen erfolgreich absolviert werden.

aa. Specialization „Evolution“

Modules totaling at least 36 C must be successfully completed in accordance with the following provisions.
Es müssen Module im Umfang von insgesamt wenigstens 36 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

i. Core modules

The following two modules totaling 12 C must be completed.
Es müssen folgende zwei Module im Umfang von insgesamt 12 C absolviert werden.

ii. Compulsory elective modules

Compulsory elective modules of 12-24 C must be successfully completed.
Es müssen Wahlpflichtmodule im Umfang von von 12-24 C erfolgreich absolviert werden.

iii. Elective modules

In addition, the possible difference to the 36 C must be made up by successfully completing further modules amounting to 0-12 C.
Ergänzend muss die mögliche Differenz zu den 36 C durch erfolgreiche Absolvierung weiterer Module im Umfang von 0-12 C erbracht werden.

bb. Specialization „Ecology”

Modules totaling at least 36 C must be successfully completed in accordance with the following provisions.
Es müssen Module im Umfang von insgesamt wenigstens 36 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

i. Core modules

Two modules totaling 12 C must be completed, including module M.Biodiv.404 and either M.Biodiv.402 or M.Biodiv.403.

Es müssen zwei Module im Umfang von insgesamt 12 C absolviert werden, darunter Modul M.Biodiv.404 sowie wahlweise M.Biodiv.402 oder M.Biodiv.403.

ii. Compulsory elective modules

Compulsory elective modules of 12-24 C must be successfully completed. Modules from the specializations "Plants" and "Animals" can be freely selected and combined.
Es müssen Wahlpflichtmodule im Umfang von von 12-24 C erfolgreich absolviert werden. Dabei können Module aus den Spezialisierungen „Plants“ und „Animals“ frei gewählt und kombiniert werden.

A. Area “Plants”

B. Area „Animals“

iii. Elective modules

In addition, the possible difference to the 36 C must be made up by successfully completing further modules amounting to 0-12 C.
Ergänzend muss die mögliche Differenz zu den 36 C durch erfolgreiche Absolvierung weiterer Module im Umfang von 0-12 C erbracht werden.

cc. Specialization „Conservation Biology“

Modules totaling at least 36 C must be successfully completed in accordance with the following provisions.
Es müssen Module im Umfang von insgesamt wenigstens 36 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

i. Core modules

Modules totaling 18 C must be completed, including module M.Biodiv.412, M.Biodiv.404 and either M.Biodiv.402 or M.Biodiv.403.
Es müssen Module im Umfang von insgesamt 18 C absolviert werden, darunter Modul M.Biodiv.412, M.Biodiv.404 sowie wahlweise M.Biodiv.402 oder M.Biodiv.403.

ii. Compulsory elective modules

Compulsory elective modules of 12-18 C must be successfully completed.
Es müssen Wahlpflichtmodule im Umfang von von 12-18 C erfolgreich absolviert werden.

iii. Elective modules

In addition, the possible difference to the 36 C must be made up by successfully completing further modules amounting to 0-6 C.
Ergänzend muss die mögliche Differenz zu den 36 C durch erfolgreiche Absolvierung weiterer Module im Umfang von 0-6 C erbracht werden.

c. Supplementary modules

Further modules totaling at least 24 C must be successfully completed from the entire range of study specializations; double crediting of the same module in the specialization and in the supplementary area is not permitted. The modules can also be included on application from the area of professionalisation or related Master's degree programs in other faculties, provided that the module selection represents a meaningful addition to the Master's degree program.
Es müssen weitere Module im Umfang von insgesamt wenigstens 24 C aus dem Gesamtangebot der Studienschwerpunkte erfolgreich absolviert werden; eine doppelte Anrechnung desselben Moduls im Schwerpunkt und im Ergänzungsbereich ist ausgeschlossen. Die Module können auch auf Antrag aus dem Professionalisierungsbereich oder aus verwandten Master-Studiengängen anderer Fakultäten eingebracht werden, sofern die Modulwahl eine sinnvolle Ergänzung zu dem Masterstudium darstellt.

2. Area of Professionalisation (Key Competencies)

Modules totaling at least 12 C must be successfully completed. Modules from the university-wide range of key competencies, all modules from the specialist degree course, modules from the key competencies offered by the Faculty of Biology and Psychology and the following modules are suitable for this. Double crediting of the same module in the specialist degree course and professionalization area is excluded.
Es müssen Module im Umfang von insgesamt wenigstens 12 C erfolgreich absolviert werden. Hierfür eignen sich Module des universitätsweiten Schlüsselkompetenzangebots, alle Module des Fachstudiums, Module aus dem Schlüsselkompetenz-Angebot der Fakultät für Biologie und Psychologie sowie folgende Module. Eine doppelte Anrechnung desselben Moduls in Fachstudium und Professionalisierungsbereich ist ausgeschlossen.

3. Master thesis

The successful completion of the Master's thesis earns 30 C.
Durch die erfolgreiche Anfertigung der Masterarbeit werden 30 C erworben.

4. Double-Degree-Programm IMABEE

A total of 120 C must be successfully completed in accordance with the following provisions.
Es müssen Leistungen im Umfang von 120 C nach Maßgabe der folgenden Bestimmungen erfolgreich absolviert werden.

a. First year of study at the University of Göttingen

A total of 120 C must be successfully completed in accordance with the following provisions.
Es müssen Leistungen im Umfang von 120 C nach Maßgabe der folgenden Bestimmungen erfolgreich absolviert werden.

aa. First year of study

Modules totaling at least 60 C must be successfully completed in accordance with the following provisions.
Es müssen Module im Umfang von insgesamt wenigstens 60 C nach Maßgabe der folgenden Bestimmungen erfolgreich absolviert werden.

i. Compulsory Modules

The following compulsory modules totaling 12 C must be successfully completed:
Es müssen folgende Pflichtmodule im Umfang von insgesamt 12 C erfolgreich absolviert werden:

M.Biodiv.400: Species identification and natural history (8 C, 8 SWS)..... 1255

M.Biodiv.405: Botanical or zoological field trip (4 C, 4 SWS)..... 1260

ii. Area of specialization

One of the study specializations according to Section 1 No. b must be successfully completed with a total of at least 30 C.
Es muss einer der Studienschwerpunkte nach Ziffer 1 Nr. b im Umfang von insgesamt wenigstens 30 C erfolgreich absolviert werden.

iii. Supplementary module

At least one module in accordance with section 1 no. c amounting to at least 12 C must be successfully completed.

Es muss wenigstens ein Modul nach Ziffer 1 Nr. c im Umfang von wenigstens 12 C erfolgreich absolviert werden.

iv. Area of Professionalisation (Key Competencies)

Modules for the acquisition of key competencies totaling at least 6 C must be successfully completed.
Es müssen Module für den Erwerb von Schlüsselkompetenzen im Umfang von insgesamt wenigstens 6 C erfolgreich absolviert werden.

bb. Second year of study

A total of at least 60 C must be successfully completed in accordance with the examination regulations of a partner university, including the Master's thesis (30 C).
Es müssen Leistungen im Umfang von insgesamt wenigstens 60 C nach Maßgabe der prüfungsrechtlichen Bestimmungen einer Partneruniversität erfolgreich absolviert werden, darunter die Masterarbeit im Umfang von 30 C.

b. First year of study at a partner university

Students who have successfully completed the first year of the IMABEE program at one of the partner universities must successfully complete a total of at least 60 C in accordance with the following provisions.
Studierende, die das erste Studienjahr des IMABEE-Programms an einer der Partneruniversitäten erfolgreich absolviert haben, müssen Leistungen im Umfang von insgesamt wenigstens 60 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolvieren.

aa. Compulsory Modules

The following compulsory modules totaling 14 C must be successfully completed:
Es müssen folgende Pflichtmodule im Umfang von insgesamt 14 C erfolgreich absolviert werden:

bb. Compulsory Elective modules

Modules from the list of compulsory elective modules or elective modules of the area of specialization according to Section 1 No. b totaling at least 16 C must be successfully completed.
Es müssen Module aus der Liste der Wahlpflicht- und Wahlmodule der Studienschwerpunkte im Umfang von insgesamt wenigstens 16 C erfolgreich absolviert werden.

cc. Master thesis

The successful completion of the Master's thesis earns 30 C.
Durch die erfolgreiche Anfertigung der Masterarbeit werden 30 C erworben.

Georg-August-Universität Göttingen **Module B.Geo.209: Biosedimentology**	7 C 6 WLH

Learning outcome, core skills:	**Workload:**
Das Modul bietet einen Einstieg in die bio- und lithofazielle Analyse biogener Sedimente mit Schwerpunkt auf der Interpretation karbonatischer Ablagerungsräume. Vermittelt werden die physikochemischen Rahmenbedingungen und methodologische Grundlagen sowie der grundsätzliche Aufbau, die texturellen und strukturellen Merkmale und die Klassifikation von Karbonatgesteinen. Der Schwerpunkt der Übungen liegt auf der eigenständigen Identifikation fossiler Organismengruppen, mikrobieller Strukturen und diagenetischer Veränderungen in Gesteinsdünnschliffen und der anschließenden Interpretation hinsichtlich der Ablagerungsbedingungen und -räume. Die Geländeübung mit Schwerpunkt auf Karbonatplattformen mit ihren Faziesbereichen vermittelt zwischen der Faziesanalyse anhand von Gesteinsproben/-dünnschliffen und dem großräumigen geologischen Befund.	Attendance time: 84 h Self-study time: 126 h

Course: Gesteinsbildende Organismen und karbonatische Ablagerungsräume (Lecture, Exercise)	3 WLH
Examination: Practical examination (120 minutes) **Examination prerequisites:** Regelmäßige Teilnahme an den Übungen **Examination requirements:** Die Studierenden erbringen den Nachweis über Kenntnisse zu gesteinsbildenden Organismen, zu biogenen Sedimenten, und zu Ablagerungsräumen. Sie können Karbonate sicher klassifizieren. Sie weisen zudem den sicheren Umgang mit Binokular und Polarisationsmikroskop nach.	4 C

Course: Biogene Sedimentgesteine (8-tägige Geländeübung)	3 WLH
Examination: Bericht (max. 15 pages), not graded **Examination requirements:** Die Studierenden sind in der Lage anhand von Geländebeobachtungen die Fazies zu deuten und in einen großräumigen geologischen und paläogeographischen Zusammenhang zu stellen.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** apl. Prof. Dr. rer. nat. Gernot Arp
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 5
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.Agr.0009: Biological Control and Biodiversity**	6 C 6 WLH

Learning outcome, core skills: Gain an understanding of what biological control is and how it can be used effectivelyas part of an IPM system and how biodiversity contributes to control of pest populations and other ecosystem services.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Biological Control and Biodiversity (Lecture, Exercise, Seminar) *Contents*: • Theoretical foundations of biological control • Natural enemy behaviour and biological control success • Biodiversity and ecosystem services in agroecosystems • Practical examples of biological control projects • Plant-herbivore-predator-interactionsPrinciples of population dynamics • Biological weed control	6 WLH
Examination: Written exam (70%; 45 minutes) and presentation (30%; approx. 20 minutes) **Examination prerequisites:** regular attendance at seminar and exercise and presentation of a seminar talk **Examination requirements:** Basic knowledge of the mechanisms of biological control of herbivorous insects; methodological approaches based on case examples; role of biodiversity for ecosystem processes and the population dynamic of herbivorous insects, multitrophic interactions between plants, herbivorous insects and their natural enemies; biodiversity and services of ecosystems.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Michael Georg Rostás
Course frequency: each winter semester; Göttingen	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Additional notes and regulations: Lecture based materials; details provided during lectures.

Georg-August-Universität Göttingen **Module M.Agr.0052: Ecology and Nature Conservation**	6 C 6 WLH

Learning outcome, core skills: Die Studierenden sollen die Lebensraumtypen und Lebensgemeinschaften der Agrarlandschaften so kennenlernen, dass sie Bewertungen unter Naturschutzgesichtspunkten vornehmen können. Dazu gehört ein tiefes und interdisziplinäres Verständnis von Biodiversitätsmustern und ökologischen Prozessen, wie sie nur durch eine Integration von Ökologie, Umweltökonomie, Nutzpflanzen- und Nutztierwissenschaften erfolgen kann. Zudem werden statistische Fertigkeiten erworben, die für den Test komplexer Fragestellungen wichtig sind.	**Workload:** Attendance time: 79 h Self-study time: 101 h

Course: Bewertung und Pflege von Lebensräumen (Exercise, Seminar) *Contents*: Charakterisierung der Lebensräume der Agrarlandschaft, biologische Schädlingsbekämpfung und Räuber-Beute-Beziehungen, Biotopvernetzung und genetische Differenzierung isolierter Populationen, Versuchsplanung bei ökologischen Fragestellungen, Landschaftsplanung und Biotopbewertung, interdisziplinäre Perspektive auf Fragen der umweltfreundlichen Agrarproduktion, naturschutzgerechten Landschaftsplanung und Ressourcenmanagements.	4 WLH
Examination: Präsentation, Referat oder Korreferat (Gewicht: 60%, Dauer: ca. 20 Minuten) und Hausarbeit (Gewicht: 40%, Umfang: max. 25 Seiten) **Examination prerequisites:** Teilnahme an den praktischen Übungen, Anwesenheitspflicht, max. 2 Fehltermine **Examination requirements:** Interdisziplinäre Sichtweise auf Probleme im Spannungsfeld von Landwirtschaft und Naturschutz	3 C

Course: Landwirtschaft und Naturschutz (Seminar) *Contents*: Interdisziplinäre Perspektive auf Fragen der umweltfreundlichen Agrarproduktion, naturschutzgerechten Landschaftsplanung und des Ressourcenmanagements in multifunktionalen Agrarlandschaften.	2 WLH
Examination: Präsentation (ca. 20 Minuten) **Examination prerequisites:** Teilnahme an den praktischen Übungen, Anwesenheitspflicht, max. 2 Fehltermine **Examination requirements:** Grundlegende Kenntnisse im Bereich der Bewertung und Pflege von Lebensräumen.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Catrin Westphal
Course frequency:	**Duration:**

each winter semester	1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module M.Agr.0061: Practical Course Nature Conservation in Agricultural Landscapes**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
Die Studierenden sollen lernen, wie man sich selbständig eine innovative Fragestellung erarbeitet und wie ein Versuchsdesign ausschauen kann, das zur Beantwortung dieser Frage geeignet ist. Die Erfahrung mit selbständiger Anlage und Auswertung von Experimenten ist eine elementare Grundlage für wissenschaftliches Arbeiten, wie es letztlich bei der Masterarbeit gefordert ist. Zudem erlaubt die kritische Diskussion der Vorgehensweise, die Glaubwürdigkeit von wissenschaftlichen Arbeiten und Gutachten besser zu beurteilen.	Attendance time: 56 h Self-study time: 124 h

Course: Projektpraktikum Naturschutz in der Agrarlandschaft (Internship, Seminar) *Contents*: Selbständige Erarbeitung von Problemstellungen und Versuchen zur Fragen des Naturschutzes in der Agrarlandschaft. Die Studierenden erarbeiten eine innovative Fragestellung und ein zum Testen der jeweiligen Hypothesen geeignetes Versuchsdesign. Der Versuchsplan wird im Plenum vorgestellt und diskutiert. Die Feld- und Laborexperimente finden danach weitgehend selbständig statt. Die statistische Auswertung der Ergebnisse wird Teil eines Protokolls, das wie eine wissenschaftliche Arbeit aufgebaut sein soll (Einleitung, Methoden, Ergebisse, Diskussion). Bei allen Schritten findet eine intensive Betreuung und Anleitung statt.	4 WLH
Examination: Hausarbeit (max. 20 Seiten, 70%) und Präsentation, Referat oder Korreferat (ca. 15 Minuten, 30%) **Examination requirements:** Erfahrung mit selbständiger Anlage und Auswertung von Experimenten. Kenntnisse zur statistischen Auswertung der gewonnen Ergebnisse. Referat: In einem 12-minutigen 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). 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:	**Recommended previous knowledge:**
none	none
Language:	**Person responsible for module:**
German	Prof. Dr. Catrin Westphal

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 **Module M.Agr.0089: Ecology Seminar**	3 C 2 WLH

Learning outcome, core skills: Die Studierenden sollen sich mit der aktuellen Literatur befassen und lernen, welche Stärken und Schwächen die vorgestellten Arbeiten haben. Zudem sollen sie mit eigenen Vorträgen und in der Diskussion lernen, ihre Ansichten argumentativ zu vertreten und sich mit kontroversen Haltungen auseinanderzusetzen. Darüber soll ein tieferes Verständnis und eine größere inhaltliche Sicherheit bei aktuellen ökologischen Themen erreicht werden.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Ökologisches Seminar (Seminar) *Contents*: In diesem Seminar werden aktuell Themen der Ökologie und Biodiversitätsforschung durch die TeilnehmerInnen vorgestellt und diskutiert. Dazu gehören zum einen kontroverse Diskussionen in der aktuellen Literatur zu Fragen wie dem Zusammenhabng von Biodiversität und Ökosystemfunktionen in Agrarsystemen oder zur Bedeutung des Globalen Wandels für Ökosysteme. Zum anderen werden anhand aktueller Forschungsarbeiten Problem des Versuchsdesigns und der statistischen Auswertung diskutiert. In regelmässigen Abständen gibt es auch Vorträge von eingeladenen Gästen aus dem In- und Ausland.	2 WLH
Examination: Term Paper (max. 15 pages) **Examination requirements:** Erarbeitung von Hintergrundwissen zu verschieden Themen der Ökologie und der Biodiversitätsforschung,die Fähigkeit, eigene Ansichten argumentativ zu vertreten und Hintergrundwissen zu Versuchsdesign und statistischer Auswertung zu erlangen. Hausarbeit: Teilnahme an mind. 10 Seminarterminen und Protokoll von mind. 5 Seminarthemen von max. 15 Seiten Gesamtlänge.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Catrin Westphal
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module M.Bio-NF.306: Introduction to behavioural biology**	12 C 12 WLH

Learning outcome, core skills: The students learn the basic concepts in behavioral biology with emphasis on behavioral ecology, sociobiology and cognition under special consideration of the quantitative aspect of behavioral research. They gain insights into essential methods from this field of research. Students should be able to present and discuss scientific issues in oral and written form. They should also be able to gather quantitative data in the context of simple questions from the field of behavioral biology (under guidance).	**Workload:** Attendance time: 196 h Self-study time: 164 h

Course: Introduction to behavioral biology (Lecture)	3 WLH
Course: Concepts of behavioral biology (Seminar)	1 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** regular attendance and active participation, oral presentation within the seminar (~30min)	12 C

Course: Methods course: Methods in behavioral biology	8 WLH

Examination requirements: Profound knowledge of basic concepts in behavioral biology with special emphasis on behavioral ecology, sociobiology and cognition.	

Admission requirements: can't be combined with key competence module M.Bio.346 or M.Bio.366.	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Oliver Schülke Prof. Dr. Julia Ostner
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 4	

Georg-August-Universität Göttingen **Module M.Bio-NF.307: Behavioural biology**	12 C 14 WLH

Learning outcome, core skills: Students know the principles of evolutionary approaches to behavioural analysis. They are able to present and disuss scientific facts in written and oral form. They are able to plan and carry out simple behavioural biology projects and experiments. Students can collect and analyse quantitative data using various technical tools.	**Workload:** Attendance time: 196 h Self-study time: 164 h

Course: Behavioral biology (Lecture)	3 WLH
Course: Behavioral biology (Seminar)	1 WLH

Course: Practical course in behavioral biology with the possibility to do parts of the course in Madagsacar	10 WLH

Examination: Written examination (90 minutes) **Examination prerequisites:** Seminarvortrag (ca. 15 min)	12 C

Examination requirements: Students demonstrate that they know the determinants and mechanisms of behavior and are able to apply important methods of behavioral research.	

Admission requirements: M.Bio-NF.306	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Claudia Fichtel
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 2	

Additional notes and regulations:
The modules M.Bio-NF.307 and M.Bio.347 are mutually exclusive.

Georg-August-Universität Göttingen **Module M.Bio.101: General and applied microbiology**	12 C 14 WLH

Learning outcome, core skills: **Learning outcome:** Evolution and phylogenetic system; morphology and cell biology; communities and biocoenosis of bacteria and archaea; gene expression and molecular control (transcription, translation); posttranslational control, protein stability and proteomics; genetic networks; molecular switches and signal transduction; microbial developmental biology; mechanisms of pathogenicity of important pathogens; development of new antimicrobial agents; diversity of the metabolism in bacteria and archaea as basis for biotechnological applications; industrial microbiology. **Methods course:** Acquisition of biomolecular, genetic, and biochemical techniques for manipulation and analysis through experiments from current fields of research, e.g. structural analysis and classification of bacteria, transformation, isolation of DNA, sequencing of DNA, diagnostic and Real-time PCR, fluorescence microscopy, enzyme assays, cloning, protein purification. **Core skills:** Knowledge of microorganisms relevant for biotechnology and medicine, ability to identify these organisms and to analyse them with molecular methods. Independent acquisition of professional and critical dealing with knowledge from publications on current topics in microbiology.	**Workload:** Attendance time: 196 h Self-study time: 164 h

Course: General and applied microbiology (Lecture)	3 WLH
Examination: written examination covering lecture topics (90min, 90% of grade) and seminar presentation (15min, 10% of grade) **Examination prerequisites:** regular attendance in methods course and seminar, protocol	12 C

Course: General and applied microbiology (Seminar)	1 WLH

Course: Methods course: Signal transduction in bacteria (Practical course) or	

Course: Methods course: Isolation and characterisation of biotechnologically relevant microorganisms (Practical course)	10 WLH

Examination requirements: Detailed knowledge in cell biology, biochemistry and genetics of procaryotic microorgansims. Deepened knowledge of molecular biological, genetic and biochemical techniques to analyze procaryotes. Ability to critically present and reflect scientific publications.	

Admission requirements: can't be combined with key competence module M.Bio.141	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Jörg Stülke

Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 48	

Georg-August-Universität Göttingen **Module M.Bio.111: General and applied microbiology - advanced module I**	12 C 20 WLH

Learning outcome, core skills: Students are able to perform specific microbiological and biomolecular techniques independently. They know how to record, interpret and present their experimental results in written form.	**Workload:** Attendance time: 280 h Self-study time: 80 h

Course: Lab course I, 7 weeks	20 WLH
Examination: Oral examination (approx. 30 minutes) **Examination prerequisites:** certified protocol in form of a scientific publication (paper) or oral presentation (in agreement with supervisor)	12 C

Examination requirements: profound knowledge of a specific research field, including molecular biological and microbiological techniques	

Admission requirements: M.Bio.101	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Bio.121: General and applied microbiology - advanced module II**	12 C 20 WLH

Learning outcome, core skills: Students are able to perform specific microbiological and biomolecular techniques independently. They know how to record, interpret and present their experimental results in written form.	**Workload:** Attendance time: 280 h Self-study time: 80 h

Course: Lab course II, 7 weeks	20 WLH
Examination: Oral examination (approx. 30 minutes) **Examination prerequisites:** certified protocol in form of a scientific presentation ("paper") or scientific oral presentation (in agreement with supervisor)	12 C

Examination requirements: Profound knowledge of a specific research field, including molecular biological and microbiological techniques.	

Admission requirements: M.Bio.101	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Bio.141: General and applied microbiology**	3 C 3 WLH

Learning outcome, core skills: **Learning outcome:** Evolution and phylogenetic system; morphology and cell biology; communities and biocoenosis of bacteria and archaea; gene expression and molecular control (transcription, translation); posttranslational control, protein stability and proteomics; genetic networks; molecular switches and signal transduction; microbial developmental biology; mechanisms of pathogenicity of important pathogens; development of new antimicrobial agents; diversity of the metabolism in bacteria and archaea as basis for biotechnological applications; industrial microbiology. **Core skills:** Knowledge of microorganisms relevant for biotechnology and medicine, ability to identify these organisms and to analyse them with molecular methods.	**Workload:** Attendance time: 42 h Self-study time: 48 h

Course: lecture: General and applied microbiology (Lecture)	3 WLH
Examination: Written examination (90 minutes)	3 C

Examination requirements: detailed knowledge in cell biology, biochemistry and genetics of procaryotic microorgansims	

Admission requirements: can't be combined with core module M.Bio.101	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Jörg Stülke
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Bio.321: Current Developmental Biology**	12 C 14 WLH

Learning outcome, core skills:	**Workload:**
Learning objectives: In depth knowledge of theoretical principles in developmental genetics, biochemistry, and biology as well as of practical methodology in analyzing morphogenetic and pattern formation processes. Understanding and application of methods to identify and analyze gene function as well as manipulate embryos. Molecular and histological analysis of developmentally-relevant induction and cell interaction processes. Knowledge of databases for *in silico* sequence analysis and model system specific databases. Insights into the evolution of developmental processes. Core skills: Planning and execution of molecular biological, genetic and embryological experiments to analyze developmental processes. Critical analysis of results, scientific presentation, and discussion of experimental data. Use of publicly accessible resources for research in developmental biology.	Attendance time: 196 h Self-study time: 164 h

Course: Developmental biochemistry, genetics, and biology (Lecture)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Oral presentation of a publication (ca. 20 min); scientific presentation and discussion of own experimental data	12 C

Course: Übungen und Vertiefung der Vorlesungsinhalte (Tutorial)	1 WLH
Course: Current Topics in Developmental Biology (Seminar)	1 WLH

Course: Aktuelle Techniken der Entwicklungsbiologie (Practical course)	10 WLH

Examination requirements:	
Advanced knowledge of principles in developmental genetics, biochemistry, and biology with emphasis on morphogenetic and pattern formation processes as well as focus on signal cascades and gene networks that control developmental processes. Understanding of techniques to identify, analyze, and manipulate the function of developmental genes as well as developmental processes. Knowledge of diverse model organisms with their strength and weaknesses. Application of this knowledge to new scientific questions.	

Admission requirements: cannot be combined with M.Bio.392 or M.Bio.393	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Ernst Anton Wimmer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 1 - 3
Maximum number of students:	

20	

Georg-August-Universität Göttingen **Module M.Bio.346: Introduction to behavioral biology (key competence module)**	6 C 4 WLH

Learning outcome, core skills: Profound knowledge of basic concepts in behavioral biology with special emphasis on behavioral ecology, sociobiology and cognition. Special consideration of the quantitative aspect of behavioral research. Students are able to present and discuss scientific issues in oral and written form.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Introduction to behavioral biology (Lecture)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** oral presentation (~ 30 min)	6 C

Course: concepts of behavioral biology (Seminar)	1 WLH

Examination requirements: Profound knowledge of basic concepts and the quantitative aspect of behavioral research	

Admission requirements: can't be combined with core module M.Bio.306 or key competence module M.Bio. 366	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Julia Ostner
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module M.Bio.347: Behavioral biology (key competence module)**	6 C 4 WLH

Learning outcome, core skills: Students know the principles of the evolutionary approach in behavioral analyses. Students are able to present and discuss scientific issues in oral and written form.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Behavioral biology (Lecture)	3 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** regular and active participation, oral presentation within seminar	6 C

Course: Behavioral biology (Seminar)	1 WLH

Examination requirements: Profound knowledge of determinants and mechanisms of behavior. Ability to use important methods of behavioral biology.	

Admission requirements: M.Bio.306 or M.Bio.346: Introduction to Behavioral Biology; can't be combined with core module M.Bio.307	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Claudia Fichtel
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Bio.381: Current developmental biology - advanced module**	12 C 20 WLH

Learning outcome, core skills: Advanced knowledge in planning and execution of scientific experiments in the field of current developmental biology. Accurate and detailed documentation of the experimental design and performance of the experiments as well as the obtained results. Evaluation of the advantages and disadvantages of the applied methods. Research and consideration of the basics (textbook knowledge) and already published original papers in the specific field of research. Discussion of the obtained results.	**Workload:** Attendance time: 280 h Self-study time: 80 h

Course: practical course 9 weeks	20 WLH
Course: Departmental seminar	
Examination: mündliche Blockprüfung **Examination prerequisites:** regular attendance in departmental seminar, scientific presentation and discussion of results (paper-style, max 10 pages)	12 C

Examination requirements: Profound knowledge of a specific research topic on current developmental biology. Familiarity with the methods used in this field. Proven ability to present own experimental data.	

Admission requirements: M.Bio.321 or M.Bio.322	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Ernst Anton Wimmer
Course frequency: each semester	**Duration:** 1 oder 2
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Bio.392: Current Developmental Biology**	6 C 4 WLH

Learning outcome, core skills: Learning objectives: In depth knowledge of theoretical principles in developmental genetics, biochemistry, and biology as well as of practical methodology in analyzing morphogenetic and pattern formation processes. Understanding of methods to identify and analyze gene function as well as manipulate embryos. Knowledge of databases for *in silico* sequence analysis and model system specific databases. Insights into the evolution of developmental processes.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Developmental biochemistry, genetics, and biology (Lecture)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Oral presentation of a publication (ca. 20 min)	6 C

Course: Exercises to and consolidation of lecture contents (tutorial)	1 WLH

Course: Current Topics in Developmental Biology (Seminar)	1 WLH

Examination requirements: Advanced knowledge of principles in developmental genetics, biochemistry, and biology with emphasis on morphogenetic and pattern formation processes as well as focus on signal cascades and gene networks that control developmental processes. Understanding of techniques to identify, analyze, and manipulate the function of developmental genes as well as developmental processes. Knowledge of diverse model organisms with their strength and weaknesses. Application of this knowledge to new scientific questions.	

Admission requirements: cannot be combined with M.Bio.321 or M.Bio.393	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Ernst Anton Wimmer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 5	

Georg-August-Universität Göttingen **Module M.Bio.393: Current Developmental Biology**	3 C 3 WLH

Learning outcome, core skills: In depth knowledge of theoretical principles in developmental genetics, biochemistry, and biology as well as of practical methodology in analyzing morphogenetic and pattern formation processes. Understanding of methods to identify and analyze gene function as well as manipulate embryos.	**Workload:** Attendance time: 42 h Self-study time: 48 h

Course: Developmental biochemistry, genetics, and biology (Lecture)	2 WLH
Course: Exercises to and consolidation of lecture contents (tutorial)	1 WLH
Examination: Written examination (90 minutes)	3 C

Examination requirements: Advanced knowledge of principles in developmental genetics, biochemistry, and biology with emphasis on morphogenetic and pattern formation processes as well as focus on signal cascades and gene networks that control developmental processes. Understanding of techniques to identify, analyze, and manipulate the function of developmental genes as well as developmental processes. Knowledge of diverse model organisms with their strength and weaknesses. Application of this knowledge to new scientific questions.	

Admission requirements: cannot be combined with M.Bio.321 or M.Bio.392	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Ernst Anton Wimmer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 5	

Georg-August-Universität Göttingen **Module M.Biodiv.400: Species identification and natural history**	8 C 8 WLH

Learning outcome, core skills: In 400.1, we provide the students with a toolbox to identify species from various taxonomic groups. We cover natural history, taxonomy and ecology, illustrate key ID characteristics of genera and species and introduce the participants to survey and – where applicable – collection and preservation methods. Identification courses with fieldwork components and the four one-day field trips allow the students to familiarize with the habitats of the species covered, in the cultural landscapes and forests of Göttingen and the surroundings. At the end of the course the participants will be able to identify a large proportion of the taxa covered, both in the field and in collections. They will be familiar with important survey methods and advanced tools such as AI-aided online identification. The will be able to find and survey species in their natural habitats.	**Workload:** Attendance time: 112 h Self-study time: 128 h

Course: M.Biodiv.400.1 Species identification and natural history (Course) One of the following courses: • Pollen analysis (400.1a) • Identification, diversity and ecology of mosses and lichens (400.1b) • Identification, diversity and ecology of grasses (400.1c) • Identification, diversity and ecology of birds (400.1d) • Identification, diversity and ecology of moths (400.1e) • Identification, diversity and ecology of *Hymenoptera* (400.1f) • Identification, diversity and ecology of other taxa depending on the availability of course facilitators (400.1h).	6 WLH

Course: M.Biodiv.400.2 Four one-day field trips • Two zoological one-day field trips • Two botanical and vegetation-ecological one-day field trips	2 WLH

Examination: Written protocol of the species identification course (max. 10000 words) **Examination prerequisites:** Participation in four one-day field trips	8 C

Examination requirements: Participants will need to be familiar with key identification features and will need to understand how to use field guides, taxonomic keys and online AI tools for identification. They will need to be familiar with the natural history, ecology and habitats of the species covered.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Johannes Kamp

Course frequency: Each winter or summer semester	**Duration:** 1-2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.Biodiv.402: Plant ecology and ecosystems research**	6 C 4 WLH

Learning outcome, core skills: The students • acquire an overview of the most important habitats all over the world and their respective vegetation and ecology • acquire profound knowledge of the habitats of exemplarily selected climate zones and their ecology • know basic correlations between climate, soil and vegetation on different continents • acquire a global overview of the anthropogenous causes of ecosystem burdens and biodivesity loss	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Vegetation and ecology of the world (Lecture)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Seminar talk (max. 25 minutes)	6 C

Course: Plant ecology and ecosystems research (Seminar) One seminar from following options: • M.Biodiv.402.4: Current topics in plant ecology and nature conservation • M.Biodiv.402.6: Anthropogenic impacts on biodiversity loss: an example from tropical intertidal wetlands	2 WLH

Examination requirements: Understanding of the ecosystems' and global perspectives of plant ecology and of consequences of anthropogenic impacts on ecosystems' biodiversity and conservation issues.	

Admission requirements:	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: each winter semester; 402.6 each summer semester	**Duration:** 1-2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.Biodiv.403: Vegetation ecology and vegetation history**	6 C 4 WLH

Learning outcome, core skills: The students acquire knowledge and a profound understanding of temporal and spatial vegetation patterns; one focus lies on biomes, climate zones and other large-scale vegetation areas, another focus lies on biological and geobotanical principles and basics on different scale levels and in different natural environments. Perception and knowledge in basic and applied fields of advanced vegetation ecology, vegetation history, sociology and chorology of plants, conception and reception of scientific papers; presentation skills.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Vegetation ecology and vegetation history (Lecture) One lecture from following options: • M.Biodiv.402.1 Vegetation & ecology of the earth • M.Biodiv.403.2 General vegetation history of the earth	2 WLH
Course: Modern issues of vegetation science in agricultural landscapes (Seminar)	2 WLH
Examination: Seminar talk (ca. 30 minutes)	6 C

Examination requirements: Knowledge of temporal and spatial vegetation patterns with focus on biomes, climate zones and other large-scale vegetation areas.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: each winter semester	**Duration:** 1-2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 16	

Additional notes and regulations: The seminars in modules M.Biodiv.403 and M.Biodiv.406 are mutually exclusive.

Georg-August-Universität Göttingen **Module M.Biodiv.404: Animal ecology**	6 C 4 WLH

Learning outcome, core skills: The lecture presents principles and theories of ecology and introduces current topics of ecological research. Topics include population ecology, interactions in animal communities, food webs, biodiversity and ecological theories. The seminar covers current topics of ecological and evolutionary research. In the seminar the students acquire advanced knowledge of methods and strategies to analyze ecological communities. Knowledge of ecological theories and modelling. Principles of animal populations and food webs. Experimental and statistical methods for the analysis of animal communities. Knowledge of current topics of animal ecological and evolutionary biology research.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Animal ecology (Lecture)	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Oral presentation (ca. 20 minutes) **Examination requirements:** Knowledge of ecological principles and theories, population models. Functional responses, analysis and modelling of biotic interactions and food webs. Biodiversity and ecosystem functioning.	6 C

Course: Topics of animal ecology and evolution (Seminar)	2 WLH

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Stefan Scheu
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Biodiv.405: Botanical or zoological field trip**	4 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students participate in a field trip (at least 10 days, “Große Exkursion”). Field trips of all departments and other institutions at the Faculty of Biology and Psychology will be accepted. Field trips of other faculties will be accepted if they have a focus related to biodiversity, ecology, evolution or conservation. Field trips will typically comprise the study of habitats and land-use types, observation, surveys or collection of species, and interaction with local scientists. Field trips might also contain stakeholder interactions, lectures and seminars or lab work. After completing this module, students will be able to familiarize themselves with ecosystems and land-use types not found in the study region, from regional (e.g. northwest Germany) destinations to regions on other continents (e.g. in the tropics). The will study species in their natural habitats, and will learn about their evolution, biogeography, ecology and conservation.	Attendance time: 56 h Self-study time: 64 h

Course: Botanical or zoological field trip One regional or international field trip of at least 10 days duration with botanical or zoological focus.	4 WLH
Examination: Written protocol (max. 10,000 words) or seminar talk (20 min)	4 C

Examination requirements: Participants have gained insight into the ecosystems visited, have acquired species identification knowledge and knowledge about the biodiversity, evolution and ecology of flora, fauna and habitats, and have understood social-ecological systems.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Mark Maraun
Course frequency: Each winter or summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Biodiv.406: Regional vegetation ecology and phytodiversity**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students acquire an improved level of understanding plant diversity and vegetation on various spatial and temporal scales. Subject-specific literature and other basic and applied data sources are evaluated. The academic and administrative background of the EU Habitats Directive is highlighted as well as its implementation in biodiversity conservation and its achievements in the conservation of natural and semi-natural habitats on national and international level. The students review and present current research in vegetation ecology and how this information is handled in academic journals. They learn problem-oriented perception of concepts such as ecoregions and biomes, land use and nature conservation from a vegetation ecologist's perspective. They acquire skills in understanding, evaluating, appreciating and questioning scientific publications, receive performance instructions, gain insight in the conception and scientific capacity of biodiversity-related instruments in conservation administration and policy.	Attendance time: 56 h Self-study time: 124 h

Course: Habitat types of the EU Habitats Directive (Lecture)	2 WLH
Course: Modern issues of vegetation science in agricultural landscapes (Seminar)	2 WLH
Examination: Seminar talk (30 minutes)	6 C

Examination requirements:	
Proven knowledge of plant diversity and vegetation on various spatial and temporal scales; in-depth skills in applied geobotany and/or biogeography; profound knowledge in present-day strategies for the conservatin of habitat types and ecoregions on national and international level.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Erwin Bergmeier Dr. Jenny Schellenberg
Course frequency: each winter semester	**Duration:** 1-2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 16	

Additional notes and regulations:
The seminars in modules M.Biodiv.403 and M.Biodiv.406 are mutually exclusive.

Georg-August-Universität Göttingen **Module M.Biodiv.412: Conservation biology**	6 C 4 WLH

Learning outcome, core skills: In 412-1, we provide a comprehensive overview of the foundation and history of conservation science, including underlying theories and principles in ecology and biodiversity research. In 412-2, we cover an introduction to trends in biodiversity and illustrate drivers of biodiversity decline such as habitat loss, fragmentation and degradation, overexploitation, climate change, and invasive species. We introduce methods to monitor biodiversity and ecosystem services. We conclude with international approaches to counteract biodiversity loss and critically discuss the role of protected areas, conservation management and ecosystem restoration. The seminars complement the lecture topics and cover recent debates in conservation biology, conservation in agricultural landscapes and global policies in environmental protection and conservation. **Core skills acquired:** By the end of the lecture, students will have understood the state of global biodiversity, major threats and mitigation measures. They will be able to develop conservation strategies, to critically judge conservation initiatives, and to advise decision makers.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Conservation biology (Lecture) One lecture of the following options: • M. Biodiv. 412-1: Origins of Conservation Biology • M. Biodiv. 412-2: International Nature Conservation	2 WLH

Course: Conservation biology (Seminar) One seminar from the following options: • M.Biodiv.412-3: Current topics in Conservation Biology • M.Agr.0089: Ecological Seminar • M.FES.312.1: Global Environmental and Forest Policy	2 WLH

Examination: Written examination, M.Biodiv.412-1 or M.Biodiv.412-2 (90 minutes) **Examination prerequisites:** Seminar talk (20 minutes)	6 C

Examination requirements: Participants understand the state of biodiversity, drivers of declines and mitigation measures in various habitats, globally. They have a comprehensive understanding of the methods used in conservation science, both for the natural and social science. They are able to make informed judgements on conservation management, actions and policies. They are able to connect different topical areas of conservation conceptually.	

Admission requirements: none	**Recommended previous knowledge:** none
Language:	**Person responsible for module:**

English	Prof. Dr. Johannes Kamp
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
The seminar M.Agr.0089 in M.Biodiv.412 and module M.Agr.0089 are mutually exclusive.

Georg-August-Universität Göttingen **Module M.Biodiv.415: Evolutionary biology**	6 C 4 WLH

Learning outcome, core skills: The lecture “Evolutionary Biology” introduces the basics of the different elements of the theory of evolution, the mechanisms of evolution as well as the methods of evolutionary biology. The lecture is given by docents from the departments participating in the module “Evolutionary Biology”. Therefore the lecture also provides insight into the working areas and research interests of the individual departments. The lecture “Phylogeography” considers the relation between biogeography, population biology and ecology and the phylogeny of primates. Biogeographical aspects (adaptive radiations, isolations etc.) as codeterminants for the origin of species are highlighted. Acquisition of an overview of the mechanisms underlying the evolution of organisms and of the current state of knowledge of the origin of the biological diversity on earth.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: M.Biodiv.415.1: Evolutionary biology (Lecture) *Course frequency:* each winter semester	2 WLH
Course: M.Biodiv.415.3: Phylogeography (Lecture) *Course frequency:* each summer semester	2 WLH
Examination: Written examination (90 minutes) **Examination requirements:** Knowledge of the theory of evolution, the principles and mechanisms of evolution as well as of the methods of botanical and zoological evolutionary biological research.	6 C

Admission requirements: none	**Recommended previous knowledge:** Basics in phylogenetic systematics are expected.
Language: English, German	**Person responsible for module:** Prof. Dr. Thomas Friedl
Course frequency: once a year	**Duration:** 2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Biodiv.417: Research colloquia and project management**	6 C 5 WLH

Learning outcome, core skills: **Learning outcome:** The module consists of two parts. In the research colloquium, students are required to attend 14 research colloquia or symposia of at least 45 minutes over the course of one or several semesters. Colloquia can be organized by any institution of the Göttingen Campus. Colloquia that cover topics related to Biodiversity, Ecology, Evolution, and Conservation will be accepted, as well as those involving related fields such as sustainability or land use. In the project management, students develop a written research proposal for the MSc thesis and defend this proposal in an oral presentation. Proposal and presentation cover the development of research hypotheses, sampling designs, potential ways to analyze collected data, expected results and a time-scale. **Core skills acquired:** Module participants will have gained an overview of current topics in the disciplines covered by the colloquia talks and will have widened their disciplinary horizon. They will be prepared to start field or lab work for their thesis, will be prepared to deal with potential pitfalls and challenges, and will manage their thesis project efficiently.	**Workload:** Attendance time: 70 h Self-study time: 110 h

Course: Research colloquium Attendance of 14 talks in research colloquia (at least 45 min) over one or several semesters	1 WLH
Course: Project management Development of a written thesis proposal together with the supervisors and defense of the written proposal in an exam situation (presentation + questions).	4 WLH
Examination: Collegial examination according to § 6a, paragraph 4, PStO (ca. 30 min.) **Examination prerequisites:** Successful participation in 14 colloquia talks **Examination requirements:** Participants have acquired a broad background in biodiversity research: ecology, evolution, and conservation. Participants have read and synthesized the literature relevant for their thesis topic. They are able to plan the sampling design, lab work, and data analysis for a MSc thesis in a timely and efficient way.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Chair of examination board
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**

Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Biodiv.421: Plant ecology: Project course plant ecology**	6 C 8 WLH

Learning outcome, core skills: This module is meant for students to learn about • ecosystems in selected habitats in Germany as well alternatively in European or non-European regions (e.g. the Tropics/Subtropics) • principal causal connections between vegetation, climate, soil conditions, as well as land-use effects on ecosystem processes in the region • identification of characteristic plant species in the respective research region • insights of practical assessment of ecological research in the field • application and usage of respective scientific literature for oral and written presentation of the adopted study results	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Basics of the essential aspects of scientific working in plant ecology (Block course, Seminar)	1 WLH
Course: Analyses of ecological research projects and writing of scientific publications (Block course, Practical course)	6 WLH
Examination: Minutes / Lab report(ca. 20 Minuten) mit schriftlicher Ausarbeitung in Form eines wissenschaftlichen Artikels basierend auf Projektdaten (max. 15 pages) **Examination requirements:** Knowledge of the essential aspects of scientific working in plant ecology from the experimental design to a publication. Written protocol about the outcomes of the research project in form of a scientific manuscript.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: each winter semester; (announcement in the previous winter semester)	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module M.Biodiv.422: Plant Ecology: CO2 and water relations of trees**	6 C 8 WLH

Learning outcome, core skills: After completing this module students • have in-depth knowledge of the theoretical basics of plants gas exchange and water balance and its dependence on the environment, • have theoretical and practical knowledge of modern measurement technology of tree ecophysiology, • have in-depth knowledge of the theoretical basics of plants gas exchange and water balance and its dependence on the environment, • have in-depth knowledge of the effects of global warming on the ecophysiology of trees, • can independently carry out measurements of photosynthesis performance, leaf conductivity, on xylem sap flow, leaf water status and the microclimate on old and young trees in the open field, • have practical experience in carrying out ecophysiological and microclimatic measurements on the Göttingen Canopy Walkway in the Experimental Botanical Garden, • can differentiate between functional types of different tree species, • can present the results from measuring studies on carbon and water balance of plants in accordance with scientific standards in writing and orally.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Basics of CO2 and water relations in trees (Block course, Lecture)	2 WLH
Course: Photosynthesis, respiration und transpiration (Block course, Practical course)	6 WLH
Examination: Minutes / Lab report (max. 10 pages) **Examination prerequisites:** Oral presentation (max. 25 minutes)	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.423: Plant ecology: Study of habitats**	6 C 8 WLH

Learning outcome, core skills: In this module students • learn about theoretical and methodological basics of modern plant ecological site description • gain an overview of the most prominent European beech forest communities and their prevalent soil and microclimate site conditions • learn modern methods in examining microcliate variables of different forest sites • learn modern methods for the analyses of physical-chemical soil variables (incl. pH value, C and N contents, plant available nutrient contents) • practice scientific standards in presenting the study results in oral and written form	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Basics of ecological studies on forest ecosystems (Lecture)	2 WLH
Course: Ecological studies of forest ecosystems near Göttingen (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages) **Examination prerequisites:** Oral presentation (ca. 15 Min.) **Examination requirements:** Knowledge of the essential aspects of ecological studies on forest ecosystems and written and oral presentation of the study results	6 C

Admission requirements: none	**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:**
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.Biodiv.424: Field studies of plant ecology, phytodiversity, and ecosystems research**	6 C 8 WLH

Learning outcome, core skills: In this module the students learn about • ecosystems in selected habitats in Germany as well alternatively in European or non-European regions (e.g. the Tropics/Subtropics) • principal causual conections between vegetaion, climate, soil conditions, as well as land-use effects on ecosytem processes in the region • identification of characteristic plant species in the respective research region • insights of practical assessment of ecological research in the field • application and usage of respective scientific literature for oral and written presentation of the adopted study results	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Ecosystems and field work (Seminar)	2 WLH
Course: National and international field studies (Exercise) Excursion region vary between years	6 WLH
Examination: Minutes / Lab report (max. 10 pages) **Examination prerequisites:** Seminar talk (max. 25 minutes)	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: on demand in summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.425: Evolution of embryophyta**	6 C 4 WLH

Learning outcome, core skills: The students get to know the current state of research in the field of the organismic evolution of embryophyta through study, presentation and discussion of latest case studies concerning speciation, history of evolution, chromosomal and genomic evolution, reproduction biology, evolution of traits and coevolution. They get an overview of novel theoretical and methodical research approaches to the comprehension of plant evolution. They acquire the ability to develop evolutionary hypotheses and are able to choose appropriate model systems and methods for their validation. The students acquire practical skills in presentation, interpretation and discussion of results (in scientific English). They are able to describe and understand evolutionary processes, hypotheses and methods and to give examples for case studies on terrestrial plants. They can discuss scientific results in English.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Plant systematics and phycology (Seminar) *Course frequency:* each semester	2 WLH
Course: Speciation and evolution of land plants (Lecture) *Course frequency:* each winter semester	2 WLH
Examination: Written examination (60 minutes) **Examination prerequisites:** participation in the seminar and oral presentation (45 minutes) **Examination requirements:** In the written examination students demonstrate their abilities to understand and discuss evolutionary processes and hypotheses as well as their knowledge of case studies of land plants. In the seminar they must give a talk in scientific English and present the new results of research from the literature or from their own Master thesis.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Elvira Hörandl
Course frequency: lecture: each winter semester, seminar: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module M.Biodiv.426: Reproduction and evolution of flowering plants**	6 C 4 WLH

Learning outcome, core skills: Students gain detailed knowledge of the reproductive strategies and developmental biology of flowering plants. They develop a broad understanding of the relevance of reproductive biology to the evolution and ecology of plants, to general evolutionary biology issues (e.g. the paradox of gender) and to areas of application in plant breeding. Specific methodological skills for active research are learned through experimental work, karyological and embryological analyses (microscopic observation, seed flow cytometry) and statistical analyses. Students can answer questions on the reproductive and developmental biology of plants and on evolutionary biology hypotheses, and know about practical areas of application. They are capable of planning, conducting and presenting scientific studies in the area of reproductive plant biology.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Developmental and reproductive biology of flowering plants (Practical course)	3 WLH
Course: Reproductive strategies of flowering plants (Lecture)	1 WLH
Examination: Oral examination on lecture material (15 minutes) **Examination prerequisites:** Protocol of the practical course (max. 12 pages) **Examination requirements:** In the oral examination students demonstrate their skills in the reproductive and developmental biology of flowering plants, in evolutionary biology hypotheses and in practical areas of application. The result shows their skills in planning, conducting and presenting a scientific study in the area of reproductive plant biology.	6 C

Admission requirements: none	**Recommended previous knowledge:** M.Biodiv.425
Language: English	**Person responsible for module:** Prof. Dr. Elvira Hörandl
Course frequency: every second summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.428: Biodiversity and biogeography of embryophyta**	6 C 4 WLH

Learning outcome, core skills: Students are familiarised with the biodiversity of land plants in floristic areas outside Germany and learn the principles of geobotanics, ecology and evolutionary history in selected areas (Alps / Mediterranean-Makaronesien area / Tropics). They gain an overview of the biodiversity, distribution, adaptations (e.g. flower biology, life forms) and ecological niches (e.g. altitudinal layers) in the relevant habitats. They develop skills in planning and conducting field trips, in the techniques of collecting and preparation, use of identification tools and documentation techniques (e.g. geo-referencing).	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Introduction to tropical, Mediterranean-Makaronesien or Alpine floras (Seminar)	1 WLH
Course: Field course (2 weeks), alternately to the tropics, Mediterranean-Makaronesien area or the Alps (Excursion) in German	3 WLH
Examination: Protocol of the field trip (max. 15 pages) **Examination prerequisites:** Seminar talk (ca. 30 min) **Examination requirements:** Knowledge of the geobotanics, ecology, biodiversity and evolution of land plants in the floral area visited. Botanical fieldwork skills: documentation of geo-referenced habitats, observation data, identification results and where relevant collected plant material.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Elvira Hörandl
Course frequency: Biannual; alternately in the regions	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.430: Project study in palaeoecology and palynology**	6 C 8 WLH

Learning outcome, core skills: In-depth study of pollen analysis and palaeoecologically working methods, independent determination and documentation of pollen and spore types, preparation, presentation and evaluation of palaeoecologically data, use of software, familiarisation with current palaeoecologically topics. Independent, problem- and research-oriented pollen analysis studies as part of a small research project in the field of vegetation history, climate and environmental history, as well as scientific discussion of palaeoecologically topics, written and oral presentation of results.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Current topics in palynology and climate dynamics (Seminar)	2 WLH
Course: Palaeoecology / Palynology (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 10 pages) **Examination prerequisites:** Oral presentation (ca. 15 minutes) **Examination requirements:** Knowledge of pollen and spore types; pollen analytical and dendrochronological working methods. Basics of dendrochronology and dendroecology and basics of the reconstruction of climate events in the Quaternary period based on pollen diagrams and dendrochronological series.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: winter or summer semester, on demand	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Biodiv.431: Applied vegetation ecology and multivariate analysis**	6 C 8 WLH

Learning outcome, core skills: After successfully completing the module, students have acquired the following skills: • Problem-oriented implementation of a research project • Field sampling methods of vegetation ecology including vegetation sampling in various types of grassland • Identification in both flowering and vegetative plant stage • Experience in current topics on the diversity, dynamics, management and conservation of grassland ecosystems. • Evaluation and interpretation of multivariate data, Software applications for entering vegetation data, data processing and ordination analyses using R • Production and presentation of posters, Presentation of scientific research questions and results in written form.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Basics and Methods of vegetation ecological data collection and multivariate analysis (Lecture)	2 WLH
Course: Grassland vegetation and multivariate data analysis (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 15 pages) **Examination prerequisites:** Preparation and oral presentation of a scientific poster	6 C

Examination requirements: Proven knowledge of field sampling and multivariate analysis in vegetation science. Assessment of local grassland vegetation types. Knowledge in current topics on the diversity, dynamics, management and conservation of grassland ecosystems. Reporting along the standards of a scientific publication.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Erwin Bergmeier Friedemann von Lampe
Course frequency: each summer semester; for the last time in the summer semester 2025	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Biodiv.433: Vegetation history: Multivariate analysis in palaeoecology**	3 C 4 WLH

Learning outcome, core skills:	**Workload:**
Palaeoenvironmental and archaeological data are usually multivariate and samples generally represent different times in the past. This short course aims to provide an overview and hands on training of numerical methods commonly used with such datasets as well as handling radiocarbon dates and deriving chronologies. Most of the data analysis and presentation in graphs will be carried out in “R” and participants will thus gain or improve their ability to work in the R-environment. Previous knowledge of “R” is advantageous but not essential. Exercises will include classifications and ordinations and using the VEGAN package as well as constrained cluster, rate of change analysis and environmental reconstructions using RIOJA among other packages. For radiocarbon calibration we will use the programs CALIB and QXCAL and explore the R-scripts CLAM and BACON for age depth modelling. Bayesian age depth modelling as implemented in BACON and QXCAL will be discussed.	Attendance time: 56 h Self-study time: 34 h

Course: Statistical analyses in palaeoecology (Lecture, Seminar)	1 WLH
Course: Multivariate analysis (Exercise)	3 WLH
Examination: Protocol (max. 10 pages) or presentation (ca. 15 min.)	3 C

Examination requirements:	
Understanding and practical experience of numerical methods and descriptive multivariate statistics in palaeoecology and vegetation science.	

Admission requirements:	**Recommended previous knowledge:**
none	none
Language: English, German	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: biennually in the summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Biodiv.434: Introduction to the history of cultivated plants**	3 C 4 WLH

Learning outcome, core skills: The students acquire knowledge about the emergence of cultivated plants from wild plants (from wildtype to high-yielding crop plant): morphological changes, genetic principles, chronological processes of the dispersal history starting from the centers of origin/ manifolds. The students become acquainted with the tasks, methods and results related to research in vegetation history and archaeobotany (agricultural history). Upon completion of the module, students have the professional expertise to (microscopically) identify and address fossil plant remains or macro-remains (charred, not charred) and are able to microscopically identify wood species (carbonized, not caronized). They possess the ability to ecologically interpret species spectra for the reconstruction of the palaeo-environment.	**Workload:** Attendance time: 56 h Self-study time: 34 h

Course: Introduction to the history of cultivated plants (Lecture)	1 WLH
Course: Practical course of the history of cultivated plants - microscopic identification of subfossil plant remains (Exercise, Seminar)	3 WLH
Examination: Minutes / Lab report (max. 10 pages) **Examination requirements:** Knowledge of the emergence of high-yielding crops from wild plants. Skills for the identification of fossil plant residues or macro-remains and the ecological interpretation of species spectra for the paleo-environmental reconstruction.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Biodiv.435: Field studies in phytodiversity, vegetation ecology and palaeoecology**	6 C 8 WLH

Learning outcome, core skills: The students become acquainted to vegetation types in initially unknown natural areas including the temporal development and dynamics as well as methods of vegetation analysis, methods of palaeoecology, exercises for plant identification, exercises for the collection of sample material, scientific collections and environmental archives. They gather experience with field studies abroad and become acquainted to issues of phytodiversity, vegetation ecology and paleoecology. Independent recording of vegetation and environmental data, utilization of non-German floras and identification keys, organization and execution of field studies abroad, scientific data collection in field studies, presentation of results on vegetation ecology, phytodiversity and paleoecology.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Phytodiversity and paleoecology of a natural and cultural area (Seminar)	2 WLH
Course: International field studies (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages) **Examination requirements:** Knowledge of different types of vegetation including their temporal dynamics in Central European and non-European natural areas. Knowledge of the working methods of scientific collections and environmental archives. Methods of palaeoecology.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: (irregular; take notice of announcements)	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.437: Methods in palaeoecology**	6 C 8 WLH

Learning outcome, core skills: The students learn various palaeoecological methods: analysis of annual rings, charcoal, algae, diatoms, ostracods, dinoflagellates, non-pollen palynomorphs (NPPs), amoebae, sediment parameters etc.. They acquire knowledge of different palaeoecological parameters regarding environment, vegetation, climate and human settlement history and their evaluation in the context of the global change research. They learn presentation and analysis methods and how to use modern software. The students get to know the broadness of possible applications using examples from current palaeoecological topics. Skills for the assessment of applications of palaeoecological analyses during environmental, vegetation and climate historical as well as archaeological studies. Independent realization of small problem and research oriented palaeoecological studies in the field of environmental, vegetation or climate history. Scientific examination of palaeoecological topics from global change research, presentation of results.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Methods in palaeoecology (Lecture)	1 WLH
Course: Methods in palaeoecology (Exercise)	5 WLH
Course: Current research results in palaeoecology and palynology (Seminar)	2 WLH
Examination: Oral Presentation (approx. 20 minutes) **Examination requirements:** Presentation of results of a practical work.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Hermann Friedrich Behling
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Biodiv.438: Isolation of plant and animal species in fragmented habitats**	6 C 6 WLH

Learning outcome, core skills: The fragmentation of habitats and the subsequent isolation of populations of organisms such as plants and animals are important issues related to conservation biology, planning and land management. The module introduces to the fundamental concepts of habitat and landscape fragmentation and sheds light on isolation of various species groups and subsequent ecological consequences. Plants, vertebrates and invertebrates and their interactions are integrated in exercises and projects. Participants learn advanced GIS-skills to analyse patterns and spatial relations. Students address stakeholder interests during the development of own projects. They tackle problems and investigate solutions in intensive group works, set up a GIS-based project, and present maps and concepts to stakeholders, peers and lecturers for final evaluation. Students from partner Universities (UTalca, etc.) take part, so global and local issues are addressed during online meetings and meetings on-site. Inter-University collaboration and international exchange is strengthened.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Introduction to habitat fragmentation and isolation of species (Lecture)	1 WLH
Course: Issues and solutions related to habitat fragmentation and isolation of species (Seminar)	1 WLH
Course: Online self-learning module on QGIS and work on final project ()	4 WLH
Examination: Oral Presentation (approx. 30 minutes)	6 C

Examination requirements: Knowledge of data handling, interpretation and presentation in QGIS. Critical evaluation of alternative solutions, comparison to recent literature, and ability to develop collaborative work. Presentation and defence for a mixed scientific and public audience.	

Admission requirements: none	**Recommended previous knowledge:** Basic GIS-skill are beneficial
Language: English	**Person responsible for module:** Dr. Florian Goedecke Prof. Dr. Claudio Ramirez (UTalca)
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Additional notes and regulations:
Maximum number of participants: 12 plus 12 from partner Universities (UTalca, etc.)

Georg-August-Universität Göttingen **Module M.Biodiv.441: Animal ecology: Evolutionary ecology**	6 C 8 WLH

Learning outcome, core skills: Students will learn basic techniques in phylogenetics. Oribatid mites (Chelicerata: Arachnida: Oribatida) serve as a model group. Phylogenetic relationships and biogeographical distribution patterns will be analyzed utilizing various molecular markers (18S rDNA, 28S rDNA, elongation factor 1 alpha, cytochrome oxidase I). In addition to this, the age of various taxa of oribatid mites will be studied. There is also the possibility to study the intraspecific variance of sexual and parthenogenetic species. Software includes IQ-Tree, MrBayes, and Geneious. Basic knowledge of molecular biology and bioinformatics is helpful but not mandatory to attend this course. Core skills: Modern techniques and procedures including statistical analyses for the discovery of phylogenetic relationships and biogeographical distribution patterns of animal groups. Knowledge of the intraspecific variance of sexual and parthenogenetic species.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Evolutionary ecology (Lecture)	2 WLH
Course: Evolutionary ecology - experiments (Exercise)	6 WLH
Examination: Protocol (max. 15 pages) and oral presentation (ca. 15 minutes)	6 C

Examination requirements: Knowledge of phylogenetic relationships and biogeographical distribution patterns of animal groups using the example of oribatid mites. Phylogenetic dating of animal species and determination of the intraspecific variance of sexual and parthenogenetic species.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Bastian Heimburger Prof. Dr. Stefan Scheu
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.442: Community ecology of animals**	6 C 8 WLH

Learning outcome, core skills: After completing this module, students can • analyse animal communities in ecological studies. The focus is on soil animal taxa. • ask scientific questions and posit hypotheses that can be tested. • sample animals and determine on species level, including taxa such as earthworms, spiders, beetles, diplopods, isopods, mites and collembolans. • collect environmental data from the study regions. • analyse animal and environmental data using univariate and multivariate techniques such as NMDS, DFA, PCA, DCA in R. • explain their findings in an oral presentation. Eventually, they summarize their findings in a ‘paper’ which has the same style as a scientific publication in an international journal.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Community ecology (Lecture)	2 WLH
Course: Community ecology - experiments (Practical course)	6 WLH
Examination: oral presentation (ca. 15 minutes) and protocol (max. 10 pages) **Examination requirements:** Knowledge of the invertebrate fauna of Germany, especially soil animals, such as earthworms, spiders, beetles, diplopods, isopods, mites and collembolans. Knowledge on univariate and multivariate statistical methods. Knowledge on scientific writing and data presentation.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Mark Maraun
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.443: Field studies in animal ecology and zoological biodiversity**	6 C 8 WLH

Learning outcome, core skills:	**Workload:**
Students learn in-depth analysis of animal communities in the Mediterranean region. The communities studied are analyzed taxonomically and the data collected are evaluated using experimental-statistical methods and ordination procedures. Existing knowledge of the diversity of animals and plants in different ecosystems is deepened. For this purpose, gradients are sampled in terrestrial or marine habitats of the Mediterranean region (e.g. altitudinal gradients, light gradients, temperature gradients, disturbance gradients). The animals occurring there are counted, identified and assigned to trophic groups. Furthermore, possible environmental factors that could be responsible for the composition of the respective animal communities are investigated. The results are analyzed using statistical programs such as R and Canoco. Basic knowledge of statistics and knowledge of the organismic diversity of marine and terrestrial ecosystems are desirable. Students acquire specialist skills in terrestrial and marine animal communities of Mediterranean regions.	Attendance time: 112 h Self-study time: 68 h

Course: Field research on animal ecology and zoological biodiversity (Seminar)	2 WLH
Course: Field studies of Mediterranean systems (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages) **Examination prerequisites:** Seminar talk (ca. 20 Minutes) **Examination requirements:** Qualitative and quantitative knowledge of terrestrial and marine animal communities of the Mediterranean region; knowledge of biodiversity levels and assignment to trophic animal groups. Knowledge of the influence of environmental factors on these animal communities.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Stefan Scheu
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 18	

Georg-August-Universität Göttingen **Module M.Biodiv.445: Molecular analysis of trophic interactions in soil food webs**	6 C 8 WLH

Learning outcome, core skills: The students learn: • Techniques for the molecular analysis of tropic interactions in soil food webs. The preyspectra of ground-dwelling arthropods (collembolans, mites) from forests are determinedby using PCR based gut content analysis with specific DNA markers. • Design and realization of laboratory feeding experiments. • Methods of field sampling of soil animals, DNA extraction, PCR, gel electrophoresis,capillary electrophoresis, lipid analysis. • Statistical analysis with R. • Theoretical and practical knowledge on the structure of food webs and trophic interactions. • Structure of soil animal communities	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Molecular analysis of trophic interactions in soil food webs (Lecture)	2 WLH
Course: Molecular analysis of trophic interactions in soil food webs - experiments (Practical course)	6 WLH
Examination: Protocol (max. 15 pages) and oral presentation (ca. 15 minutes)	6 C

Admission requirements: none	**Recommended previous knowledge:** Basic knowledge of molecular biology
Language: English	**Person responsible for module:** Prof. Dr. Stefan Scheu Dr. Andre Junggebauer, Dr. Melanie Pollierer
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.446: Molecular zoology and insect-biotechnology**	6 C 8 WLH

Learning outcome, core skills: The module is aimed at students who want to gain in-depth knowledge of molecular genetic work in theory and practice. Relevant methods and experimental planning are taught theoretically and practically. Selected topics of molecular zoology are treated in depth in lectures and on the basis of current publications. Current developments of molecular methods in pest control and insect biotechnology will be covered. Learning objectives: • Application, experimental strategies and evaluation of different molecular biological methods. • Gene function analysis in zoology: how to identify relevant genes and how to study their function in model and non-model organisms? (including genetic screens, reverse genetics (RNAi), genome editing (CRISPR/Cas9), transgenesis) • Identification of orthologous genes in different species • Establishment of new molecular genetic model systems for zoological questions • Advanced discussion of current research topics in molecular zoology • Advanced discussion of recent approaches in insect biotechnology using molecular genetic methods (including pest control). Students should be able to: • design experimental strategies for the identification and analysis of gene function in non-model organisms • design the establishment of new molecular genetic model systems • be able to present and assess scientific questions on selected topics of molecular zoology.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Gene function analysis in diverse animals and applications in pest control (Lecture) *Contents*: molecular genetic methods; gene fuction analysis; selected topics from molecular zoology; most recent developments in insect biotechnology	2 WLH
Course: Topics of molecular zoology and insect biotechnology (Seminar)	2 WLH
Course: Molecular zoology and insect biotechnology (Exercise)	4 WLH
Examination: Oral Presentation (approx. 20 minutes)	6 C

Examination requirements: The students should be able to apply the contents and methods listed as “core skills” to new questions.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Gregor Bucher

Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 8	

Additional notes and regulations:
The module cannot be taken in combination with B.Biodiv.370.

Georg-August-Universität Göttingen **Module M.Biodiv.447: Biodiversity, ecology and evolution of terrestrial invertebrates**	6 C 7 WLH

Learning outcome, core skills: In-depth insight into the diversity of terrestrial arthropods, especially spiders and insects, and their importance in ecological systems. In-depth knowledge of the invertebrate fauna of Central Europe. In-depth knowledge of the ecology and evolution of terrestrial invertebrates. Key competencies: Overview of the diversity of terrestrial arthropods, in-depth knowledge of dichotomous identification keys, analysis and assessment of identification characters, in-depth knowledge of the ecology and evolution of terrestrial invertebrates.	**Workload:** Attendance time: 98 h Self-study time: 82 h

Course: Biodiversity, ecology and evolution of terrestrial invertebrates (Lecture)	2 WLH
Course: Biodiversity, ecology and evolution of terrestrial invertebrates (Exercise)	5 WLH
Examination: Minutes / Lab report (max. 15 pages)	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Stefan Scheu
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.Biodiv.450: Impact of global climate change on plant communities and their functional traits**	6 C 8 WLH

Learning outcome, core skills: The students • have profound knowledge of interactions between plants • have an overview of completion research • understand the concept of “functional traits” of species and communities • are able to analyze the reaction of plants to the main factors of global climate change experimentally • have profound knowledge of the design and statistical (variance analytical) analysis of ecological experiments • are able to present the results of ecological experiments in accordance with scientific standards in written and oral form.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Impact of global climate change on plant communities (Lecture)	2 WLH
Course: Impact of global climate change on plant communities (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 10 pages) **Examination prerequisites:** Oral presentation (max. 25 minutes)	6 C

Examination requirements: Knowledge of plant interactions and of the concept of “functional traits”. Knowledge of experimental methods and statistical procedures in botanical (population) ecology. Knowledge of strategies for the adaption of plants to climate change.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Dietrich Hertel
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.462: Assessing the genetic biodiversity of algae and cyanobacteria – a practical lab course**	6 C 8 WLH

Learning outcome, core skills: After completing this module, students have knowledge of and expertise in state-of-the art DNA sequence analysis methods for detecting changes in the biodiversity of algae and cyanobacteria from environmental samples (freshwater creek benthos or surface soils of forests, grass and arable land) at the species and genotypic resolution. The students have skills in • independent molecular analyses, incl. DNA extraction from various environmental materials (e.g., soil, rock surface biofilms), PCR amplification using various genetic markers, amplicon-based NGS metabarcoding, DNA sequence phylogenetic analyses • employment of bioinformatic analyses for the refinement of raw DNA sequences from paired-end approach, development of taxon tables to show the distribution of Amplicon Sequence Variants along environmental gradients and identification of species and genotypes by sequence comparisons • basic statistical analyses of the data and common methods for the visualization of the results • microscopy of algae and cyanobacteria, establishment of pure culture strains and their analyses using DNA sequencing and phylogenetic methods	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Biodiversity and evolution of algae (Lecture)	2 WLH
Examination: Protocol (max. 15 pages) **Examination prerequisites:** Presentation (ca. 20 min.) **Examination requirements:** Knowledge of DNA methods for the analysis of the biodiversity of algae and cyanobacteria incl. standard bioinformatic and phylogenetic analyses	6 C

Course: Molecular methods for determining biodiversity using the example of algae (Practical course)	6 WLH

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Thomas Friedl
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module M.Biodiv.470: Morphology of animals: Microscopical methods in comparative morphology**	6 C 8 WLH

Learning outcome, core skills: Microscopical techniques such as confocal laser-scanning microscopy (clsm), serial block-face scanning electron microscopy (SBFSEM) and scanning electron microscopy (SEM) exhibit detailed but different insights into animal anatomy. Therefore, a comparative approach including various microscopic methods allows comprehensive investigations of a certain topic – reaching from studies of organ systems and tissue types over surface structures towards ultrastructural details of various cell types. The course will give the theoretical and practical background of different preparation techniques and microscopic methods, and will teach the latter in a scientific and project related context. With focus on comparative investigations, pros and cons of different methods will be clarified while using specific examples related to ongoing research in the department “Animal Evolution and Biodiversity”. The goal of the course is to impart basic knowledge of different morphological methods and to work on own student projects during the course.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Introduction into microscopical methods and preparation techniques (Lecture)	2 WLH
Course: Comparative microscopical investigations of animal tissues and organ systems (Exercise)	6 WLH
Examination: Protocol (max. 15 pages) **Examination prerequisites:** oral presentation (ca. 15-20 Min.) **Examination requirements:** Competence and skills in confocal laser scanning microscopy (clsm), as well as scanning and serial-block-face-scanning electron microscopy (SEM, SBFSEM); characterization of organ systems, tissue and cell structure; microscopical techniques (preparation, fixation, staining, embedding); computational 3D-reconstruction.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Dr. rer. nat. Christian Andreas Fischer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 1
Maximum number of students: 6	

Georg-August-Universität Göttingen **Module M.Biodiv.478: Field studies in systematics, biodiversity and ecology of marine invertebrates**	6 C 8 WLH

Learning outcome, core skills: The students will gain detailed knowledge in the areas of zoological systematics, biology, ecology and biodiversity of marine invertebrates. Especially communities of rocky shores and sandy beaches will be investigated and compared. For this purpose, the students will be introduced into the determination of marine invertebrates, into ecological characteristics of different habitat types, and into the systematics of different animal taxa, e.g., Annelida, Platyhelminthes or Cnidaria. Another focus will be placed on the demonstration and execution of different methods for collecting marine animals. Outdoor work will take place during low tide or using a research vessel. After introduction to the diversity of marine invertebrates, students will carry out their own outdoor work or laboratory experiments on given research questions. The field course will take place at the marine biological station Station „Estación de Biología Marina de A Graña“ in Galicia, Spain. Alternatively, the practical course might take place at other station in Europe or in Germany.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Introduction to marine biology (Lecture)	2 WLH
Course: Field studies in systematics, biodiversity and ecology of marine animals (Exercise, Seminar)	6 WLH
Examination: Oral Presentation (approx. 15 minutes) **Examination requirements:** Realization of an own project on site and independent analysis and presention of the data in form of a poster (50%) with a short talk (50%).	6 C

Examination requirements: Knowledge of different marine invertebrates and their systematics, biology and ecology. Knowledge of marine habitats.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**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:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.479: Phylogenomics**	6 C 6 WLH

Learning outcome, core skills: The research field of phylogenomics comprises the utilization of genome and transcriptome data for the inference of phylogenetic trees. In this modul students will be introduced to the theoretical and practical knowledge of how to assemble genomes and transcriptomes and their annotation. Moreover, techniques to search for genes in such data will be presented (e.g., BLAST, hidden markov models). Additionally, the students will work with different alignment- and read mapping methods. Based on the assembled datasets different tree reconstruction methods will be conducted (Neighbor Joining, Maximum Parsimony, Maximum Likelihood, Bayesian Inference) and critically discussed. Within an accompanying seminar actual studies in the field of evolutionary genomics are presented and discussed. Students get an introduction into the Linux environment and the installation of all programs will be done independently. The command line will be mainly used for all analyses. Students will learn to perform genome-scale analyses for the reconstruction of phylogenetic trees. Within a seminar students will present recently published genomic studies in English language. In the last week, datasets will be analysed independently and results will be summarized as poster, which will be presented within a short talk.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Introduction to phylogenomics (Lecture)	1 WLH
Course: Introduction to phylogenomics (Seminar) This course is open for students of the double degree programme at the partner universities. The sessions of this course might be conducted in a remote format like online video conference.	1 WLH
Course: Introduction to phylogenomics (Exercise)	4 WLH
Examination: Short talk (ca. 12-15 minutes) and poster presentation	6 C

Examination requirements: Knowledge of how to reconstruct phylogenetic trees using genomic and transcriptomics data. Critical discussion of phylogenetic analyses and overview of actual controversies.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Sarah Bank-Aubin
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 1
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Biodiv.480: Nature conservation inventories**	6 C 8 WLH

Learning outcome, core skills:	**Workload:**
For effective nature conservation the collection of reliable data on state and trend of the occurrence and abundance of animals and plants, on their habitats and on habitats shaping land use systems is indispensable. The planning and implementation of nature conservation measures and the evaluation of their effectiveness depend on the quality of information provided by nature conservation inventories and monitoring. At first the students will practically apply various data collection methods used in conservation practice and evaluate their advantages and disadvantages.The students then learn methods for surveying a selected species group (woodpeckers) and different methods for recording the composition, structure and utilization of Central European forest ecosystems. Students collect themselves data in the field under supervision and process and analyze them with integration of long-term data from a monitoring project. The students develop skills (a) to critically analyze and evaluate data sets and survey methods in nature conservation, (b) to plan and implement goal-oriented data collection in a statistically robust design, (c) to map habitats and species, (d) to manage data in databases and analyze them using statistical methods and geographic information systems and (e) to understand, structure and implement planning processes in conservation and to evaluate the information required.	Attendance time: 112 h Self-study time: 68 h

Course: Nature conservation inventories (Lecture)	2 WLH
Course: Nature conservation inventories (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages) **Examination requirements:** Knowledge of (a) collecting and analyzing data relevant to nature conservation (sampling design, quality assurance, statistics, GIS), (b) data processing for nature conservation planning, (c) monitoring and evaluation of nature conservation measures, (d) nature conservation inventories	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. nat. Hermann Hondong
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.482: Field studies in conservation biology**	6 C 4 WLH

Learning outcome, core skills: M.Biodiv.482 is a flexible module that allows for targeted ECTS credit collection. Credits will be awarded for one of the following activities: • An individual student research project, practical or internship, e.g. with a conservation NGO, in conservation administration or at a research institution. The project needs to be agreed with staff of the Conservation Biology department beforehand. • A tailored research project offered by members of the Conservation Biology Department, e.g. via https://uni-goettingen.de/en/join+us/129605.html. Students will acquire knowledge of ecosystems, species, conservation approaches, they will be involved in practical work of conservation practitioners (individual student project), or they will be trained individually in data collection, analysis and publication (internal research project).	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Field studies in conservation biology (Exercise) *Contents*: One of the following options: • Self-organized internship • Individual research project	4 WLH
Examination: Written protocol, internship report or research project report (max. 10000 words)	6 C

Examination requirements: Students are able to plan an internship or a research project. They are familiar with data collection and analysis protocols and understand the presentation of data. They are able to comprehensively summarize the outcome of an internship, or an individual research project. For research internships and individual research projects, reports can be submitted in the form of a peer-review paper.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Johannes Kamp
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Biodiv.488: Conservation biology: Ornithology**	6 C 8 WLH

Learning outcome, core skills: Students acquire knowledge on the recording and biology of native bird species. This includes knowledge of species characteristics (optical, acoustic), habitat requirements, food, breeding biology, wintering, population trends and causes of endangerment. An overview of bird orders, special sensory abilities of birds and a first insight into their social systems are also part of this. The nationwide and Europe-wide monitoring of breeding birds is taught. Students learn the visual and acoustic identification of bird species in the field and mapping methods. The method of territory mapping is deepened in the exercises and includes field surveys, data evaluation and presentation of the results on maps. The use of a digital tool for recording is taught. The students acquire knowledge to compare different habitats with regard to their avifauna. Competences: Knowledge of the biodiversity of the native avifauna and its ecology as well as field methods for its quantitative survey.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Biology of selected bird species (Lecture)	2 WLH
Course: Identification of birds in the field and methods in ornithology (Exercise)	6 WLH
Examination: Minutes / Lab report (max. 20 pages)	6 C

Examination requirements: Biodiversity of the indigenous avifauna as well as of field methods for its identification and evaluation of the endangerment potential on species and population level.	

Admission requirements: none	**Recommended previous knowledge:** Knowledge of the songs of the most common bird species
Language: English	**Person responsible for module:** Eckhard Gottschalk
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 18	

Additional notes and regulations:
If more registrations than available places are received, participants will be decided by means of a lot.

Georg-August-Universität Göttingen **Module M.Biodiv.490: Project studies in plant systematics, evolution and phylogeny**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
Students complete a research visit at a laboratory, research institution, herbarium, botanical garden or field research station outside the University of Göttingen. Students can learn techniques and methods that are not routinely taught on the degree programme and/or gain access to specific resources, e.g. plant cultures or herbarium records that are not available in Göttingen. The subject of the research project is agreed with the module supervisors and the host facility. Students gain expertise in planning and carrying out a research project and in presenting the results in the form of a scientific text. They increase their methodological skills which they can use e.g. for their Master thesis, and make contact to other research groups.	Attendance time: 56 h Self-study time: 124 h

Course: Forschungsprojekt (Exercise)	4 WLH
Examination: Minutes / Lab report (max. 20 pages) **Examination prerequisites:** Short written proposal with a working plan for the research stay (max. 5 pages) **Examination requirements:** The student presents of a short proposal with a working plan for the research stay, accomplishes the planned working tasks and documents the work in a protocol.	6 C

Admission requirements: M.Biodiv.425	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Elvira Hörandl
Course frequency: each semester; (by agreement)	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 3	

Georg-August-Universität Göttingen **Module M.Biodiv.491: Next generation sequencing for evolutionary biology**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
The students acquire knowledge of the various systems and techniques for “next generation sequencing”. The focus of the module lies on the fast developing field of bioinformatics and data analysis. Lab methods are explained and discussed. The students learn the different possible applications for “next generation sequencing” data in evolutionary biology of animals and plants, for example biodiversity, evolution of traits, adaption, phylogeography, population genetics, hybridization, genotyping and QTL (quantitative trait locus) analyses. They get an overview of the theory and gain practical experiences in this new research area. They acquire the competence to choose suitable methods for evolutionary questions and to test hypotheses on non-model organisms. The students are able to list the differences and (dis)advantages of various “next generation sequencing” methods and to select suitable methods to analyze specific evolutionary questions by use of non-model organisms. They are able to compare and analyze the raw data of “next generation sequencing” and to annotate genes of a compared genome or transcriptome. The students shall present and discuss case studies from the field of “next generation sequencing” during the seminar in scientific English.	Attendance time: 56 h Self-study time: 124 h

Course: M.Biodiv.491-1 Next generation sequencing: methods, data analysis and applications (Lecture)	0,5 WLH
Course: M.Biodiv.491-2 Next generation sequencing: examples of botanical and zoological studies (Seminar)	0,5 WLH
Course: M.Biodiv.491-3 Analysis of next generation sequencing data (Exercise)	3 WLH
Examination: Minutes / Lab report (max. 12 pages) **Examination prerequisites:** Oral presentation (max. 20 min.) **Examination requirements:** Knowledge of the various applications of "next generation sequencing" in evolutionary biology of animals and plants. Overview of the theory and practical experiences in this new research area.	6 C

Admission requirements:	**Recommended previous knowledge:**
none	Speciation and evolution of land plants (Lecture: M.Biodiv.425). Basic knowledge about programs that deal with DNA conting assembly and multiple sequence alignment (e.g. Geneious) are advantageous
Language: English	**Person responsible for module:** Natascha Dorothea Wagner

Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module M.Biodiv.492: Molecular methods for “Next Generation Sequencing”in Evolutionary Biology and Systematics**	6 C 4 WLH

Learning outcome, core skills: The students gain a detailed understanding of the use of next generation sequencing techniques for phylogenetic and evolutionary studies in plants and animals. They achieve the theoretical and practical knowledge for the application of Illumina based short-read sequencing and Nanopore long-read sequencing methods. Students will be introduced to the preparation of sequencing libraries for Illumina and Nanopore sequencing. Competence for specific laboratory methods (RNA and DNA extraction, quality checks, probe design, library preparation, target enrichment, various sequencing techniques) and basic skills for analysis of data will be gained. An introduction to the computational analysis of raw data from Illumina and Nanopore sequencing (base calling, quality checks, assembly) will be given.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Introduction into molecular markers (Lecture)	1 WLH

Course: Target enrichment and Nanopore sequencing (Exercise)	3 WLH
Examination: Minutes / Lab report (max. 12 pages)	6 C

Examination requirements: The students show in the practical protocol (including introduction, methods, results, discussion, and literature cited) their competence to collect and analyze a genomic DNA sequencing dataset on non-model organisms (plants and animals). Results must be interpreted in the context of a specific evolutionary or phylogenetic framework and presented within an oral presentation.	

Admission requirements: none	**Recommended previous knowledge:** Lecture „Speciation and Evolution of Land Plants“ in module M.Biodiv. 425
Language: English	**Person responsible for module:** Dr. Salvatore Tomasello
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Biodiv.605: Project studies in animal evolution and biodiversity**	6 C 4 WLH

Learning outcome, core skills: Consolidation of morphological and molecular approaches for evolutionary biology research in zoology. Introduction to the daily routine of work in a scientific laboratory with research questions, and their planning and conceptualization. Insights into the planning and writing of scientific publications. The scientific work might be carried out in the laboratory, outdoor and/or in research stations. Independent execution and planning of research studies. Interpretation, visualization and presentation of scientific results. Scientific discussion of current topics in animal evolution and biodiversity.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Research project (Exercise)	3 WLH
Course: Current topics in Animal Evolution and Biodiversity (Seminar)	1 WLH
Examination: Presentation (approx. 15-20 min.) and protocol in the form of a scientific publication (max. 15 pages)	6 C

Examination requirements: Elaboration and design of a scientific project and its implementation.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Christoph Bleidorn Dr. Maria Teresa Aguado
Course frequency: each semester; after consultation	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 4	

Georg-August-Universität Göttingen **Module M.Biodiv.606: Identification of bird feathers**	3 C 2 WLH

Learning outcome, core skills: Birds possess feathers as a key feature distinguishing them from all extant animals. Feathers bear information on ecology, life history, individual age and – especially – on species and often sex. A single feather may suffice to identify species, age and sex of an individual bird. Therefore, bird feathers directly reflect bird diversity. The participants will learn how to discriminate feathers of the major bird groups (like passerines, geese and ducks, waders, woodpeckers, owls etc.). Moreover, the students will learn how feather shape reveals the position on the body and what criteria may help in sexing and ageing. Participants should gain the ability to judge bird feathers (including unknown ones) as for the taxonomic group and the position on the bird body. They should use shape, structure and colours of feathers as criteria. This process should also improve species identification of dead birds and remains of preyed birds.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Identification of bird feathers (Block course, Exercise)	2 WLH
Examination: Oral Presentation (approx. 15 minutes), not graded	3 C

Examination requirements: Knowledge of bird morphology and taxonomic groups; discrimination of primaries, secondaries, tail feathers and their coverts and remaining contour feathers; attributing feathers to larger taxonomic groups; identification of frequent bird species from their feathers. In a short talk the students present the body position and taxonomic group of some given feathers to their peers.	

Admission requirements: Successful participation in M.Biodiv.488 justifies preferential admission, otherwise participation in B.Biodiv.331 bzw. M.Biodiv.401 is preferred as well.	**Recommended previous knowledge:** European bird species, taxonomic groups of birds
Language: English, German	**Person responsible for module:** apl. Prof. Dr. Andreas Stumpner
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 3
Maximum number of students: 16	

Georg-August-Universität Göttingen **Module M.Biodiv.610: Science Communication in Biodiversity research**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
Making science accessible to the general public is becoming increasingly important to address current global challenges. A fluent dialogue between scientists and policy makers, industry, and the rest of the society is absolutely necessary for science to have an influence in a positive and more sustainable future, for instance. Abilities in scientific outreach are gradually becoming one of the requirements in many job descriptions and research projects funded by governments, private companies and other institutions. However, learning how to communicate science has traditionally not been included in the curriculum of many scientific careers. This course provides the basic knowledge for scientists to effectively communicate about biodiversity to the general public. We will show how the Biodiversity Museum of the University of Göttingen can be used as platform for public outreach. The modul includes a lecture and a seminar to communicate the basics of science outreach, as well as a practical part where we will use the collections and tools of the Biodiversity Museum for individual projects. The main objectives of this course are: 1. Learn the fundamentals of science messaging and benefits of science communication to the society. 2. Communicate scientific knowledge to several different broad audiences, including general community members, youth, and policy makers. 3. Produce your own effective science communication in biodiversity, e.g interviews, videos, photos or a museum exhibition project.	Attendance time: 56 h Self-study time: 124 h

Course: Introduction to science communication (Lecture)	1 WLH
Course: Introduction to science communication (Seminar) A few sessions might be conducted in a remote format like online video conference.	1 WLH
Course: Science communication in biodiversity research (Exercise)	2 WLH
Examination: Project presentation within a talk (approx. 30 min.) **Examination prerequisites:** Realization of a science communication project within biodiversity research (e.g., design of a webpage, a movie or of an exhibition).	6 C

Examination requirements: Knowledge of basics in science communication. Learning of different techniques to present scientific knowledge.	

Admission requirements:	**Recommended previous knowledge:**
none	none
Language:	**Person responsible for module:**
English	Prof. Dr. Maria Teresa Aguado Molina

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

Georg-August-Universität Göttingen **Module M.Biodiv.611: Biodiversity research in the museum**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
Museums play a fundamental role in advancing scientific knowledge, particularly in the biological sciences. Their extensive collections, international collaboration and curatorial expertise are instrumental in advancing knowledge in various biological disciplines. This course provides the basic knowledge for scientists to investigate biological questions using a zoological collection. Through a combination of lectures, seminars, practical sessions and readings, students will learn about the importance of natural history collections and their impact on biodiversity research, and how to develop a scientific project using the collections and tools of the Biodiversitätsmuseum. The Zoological Collections of the Biodiversitätsmuseum comprise more than 120,000 specimens ranging from flatworms over extinct birds to the complete skeleton of a sperm whale, which have a scientific value, as well as cultural and historical. Currently some specimens are being exhibited in the Forum Wissen and others constitute the core of the Biodiversitätsmuseum exhibition, all of them and many more conveniently stored in the magazines are available for researchers to conduct their investigations. The main contents of this course are: • Value of natural history collections and their impact on research • Current scientific research studies in a museum: from taxonomy to museomics • How to develop collection-based research • Digitalization and scientific illustration • Preservation and management of collections	Attendance time: 56 h Self-study time: 124 h

Course: Biodiversity research in the museum (Lecture)	1 WLH
Course: Biodiversity research in the museum (Seminar)	1 WLH
Course: Biodiversity research in the museum (Exercise)	2 WLH
Examination: Project presentation (ca. 20 minutes) **Examination requirements:** Realization of a scientific project using the collection of the Biodiversitätsmuseum and presentation of the project.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Maria Teresa Aguado Molina
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.EES.202: Geobiology**	6 C 6 WLH

Learning outcome, core skills: In this module, students will be introduced to the fundamentals of geobiology and explore the complex interconnections between biotic evolution, biodiversity dynamics and environmental change by examining records of past and modern-day ecosystems. Particular emphasis is placed on the formation and preservation (“taphonomy”) of biosignatures, which are powerful tools for studying biological and environmental processes, as well as on their application to understanding geo-bio interactions in modern and fossil ecosystems. Depending on interest, the course will also touch on applications of biosignatures in related other fields such as environmental sustainability and astrobiology. The module is essential to students interested in pursuing a career in geoscience and related fields (including environmental and applied sectors), but also relevant to those from other study programs within the natural sciences (geography, biology, etc.).	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Biosignatures - From fossils to biogeochemical fingerprints (Lecture, Seminar)	2 WLH
Course: Analytical techniques in Geobiology (Excursion, Practical course)	2 WLH
Course: Biodiversity & ecosystem evolution through time (Seminar)	2 WLH
Examination: Oral Presentation (15 minutes) and written report (max. 10 pages) **Examination prerequisites:** Regular attendance in the courses	6 C

Examination requirements: In this module, students will - develop a deep understanding of geobiological key-processes in ecosystems - learn how to investigate biodiversity change, environmental processes, and geo-bio interactions in past and modern-day environments by using various types of biosignatures - practice the analysis and presentation of research results Students are required to participate regularly and to get acquainted with geobiological concepts and analytical approaches.	

Admission requirements: None	**Recommended previous knowledge:** None
Language: English, German	**Person responsible for module:** Prof. Dr. Jan-Peter Duda
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students:	

20	

Additional notes and regulations:
This course is also open for interested students outside the geosciences

Georg-August-Universität Göttingen **Module M.EES.206: Palaeobotany**	6 C 4 WLH

Learning outcome, core skills: Profound understanding of the Phanerozoic evolution and palaeoecology of plants. In-depth knowledge of processes that led to transformations of terrestrial ecosystems (e.g., initial colonization of land, floral development in the Devonian, evolution of angiosperms since the Cretaceous) and how plants reacted to mass extinctions. Awareness of the relevance of interactions with animals and fungi in land plant evolution. Conception of selected terrestrial paleoecosystems. Insights into current palaeobotanical literature. Ability to evaluate morphological traits of fossil plants, fungi and lichens using light microscopy.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Palaeobotany (Lecture)	2 WLH
Course: Current topics in palaeobotany (Seminar)	1 WLH
Course: Palaeobotany (Exercise)	1 WLH
Examination: Written examination (120 minutes) **Examination prerequisites:** Regular attendance at seminar and exercise, and a seminar talk based on a peer-reviewed journal article.	6 C

Examination requirements: Understanding the evolution and paleoecology of plants, development of palaeoecosystems, and processes driven by land plant evolution.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** Prof. Dr. Alexander Schmidt
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students: 30	

Additional notes and regulations:
This module is suitable for students of M.Sc. Earth and Environmental Science and MSc Biodiversity, Ecology and Evolution.

Georg-August-Universität Göttingen **Module M.FES.115: Statistical Data Analysis with R**	6 C 4 WLH

Learning outcome, core skills: Introduction to R as programming language for beginners, statistical data analysis including explorative data analysis, plotting, basic tests (t, F, non-parametric), ANOVA, simple linear regression, multiple regression, analysis of residuals, ANCOVA, non-linear regression, glms with focus on logistic regression, short introduction to tidyverse and ggplot; always including introduction to theory and to practical implementation in R.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Statistical Data Analysis with R (Lecture, Exercise)	4 WLH
Examination: Presentation (approx. 15 min.) with written outline (max. 10 pages)	6 C

Examination requirements:

- Import data into a statistics software and perform an explorative data analysis
- Display data graphically
- Select appropriate statistical approaches or models for data analysis
- Discuss the advantages and disadvantages of statistical approaches or models
- Apply statistical approaches or models to given data
- Explain and test assumptions of statistical approaches or models
- Interpret the results of the data analysis
- Suggest meaningful follow-up analyses
- Present and explain the procedures involved in a statistical data analysis

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Katrin Mareike Meyer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: 30	

Additional notes and regulations:
30 students are only possible if a corresponding number of computers is available

Georg-August-Universität Göttingen **Module M.FES.122: Ecological Simulation Modelling**	6 C 4 WLH

Learning outcome, core skills: • Knowledge of the modelling techniques covered; • Ability to find a suitable modeling technique for a given problem in the area of ecology and to apply it independently; • Knowledge of the current state of research in ecological modelling; • Critical appreciation and discussion of research results; • Refined presentation techniques; • Knowledge of constructive feedback techniques.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Simulation Modelling (Lecture, Exercise)	3 WLH
Course: Current Topics in Ecological Modelling (Seminar)	1 WLH
Examination: Presentation (approx. 15 min) with written outline (max. 10 pages) **Examination prerequisites:** Presentation (approx. 15 Minutes), ungraded	6 C

Examination requirements: • Know, explain, apply, analyse and assess model types that are applied in ecology • Know, explain, apply, analyse and assess the stages of model development along the modeling cycle • Present, explain and critically reflect a self developed simulation model • Understand and summarize published model studies and point out and discuss their possibilities and limitations	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Kerstin Wiegand
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: 20	

Additional notes and regulations:

20 students are only possible if a corresponding number of computers is available.

Module is also applicable for other study programs, such as MSc "Biological Diversity and Ecology", MSc "Agriculture" (specialization Ressourcenmanagement).

Georg-August-Universität Göttingen **Module M.FES.312: International Forest Policy and Economics**	6 C 4 WLH

Learning outcome, core skills: **Global environmental and forest policy:** The objective is that students get basic knowledge of both the key policies related to forests and the application of the policy analysis on such issues. Students acquire comprehension about global forest related policy processes and factual knowledge about forest actors affecting the policy on a global level. The seminar combines a lead-in to global policy theory and its translation in practical, empirical knowledge about actors and processes of high importance in forestry. The different instruments for international policy formulation and implementation are discussed using case studies. **International forest economics:** The lecture is split in two main areas: 'International Wood Markets' and 'International Environmental and Forest Conservation'. The first part deals with the international trade with wood and wood products. International markets and the consequences of protectionism are analysed. Furthermore, aspects of international wood marketing are shown. In the second part, international environmental problems are described and possibilities as well as constraints for international co-operation are discussed. Finally, relations between environmental conservation and economic development are analysed.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Global environmental and forest policy (Seminar)	2 WLH
Examination: Written examination (60 minutes)	3 C

Course: International forest economics (Lecture)	2 WLH
Examination: Written examination (60 minutes)	3 C

Examination requirements: • Familiarity with international wood markets and international trade with wood and wood products • Understanding of international wood marketing • Ability to analyse consequences of protectionism • Apply economic theory in order to analyse possible solutions towards international environmental problems • Sound understanding of the relations between forest conservation and economic development	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Carola Paul
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

cf. examination regulations	
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.211: Forest Nature Conservation and Environmental Law**	6 C 4 WLH

Learning outcome, core skills: Die Studierenden kennen die Konzepte des Waldnaturschutzes, deren ökologische Grundlage und daraus entstehende Zielkonflikte. Sie verfügen über Grundlagenwissen der Politikfeldanalyse für die rationale Beurteilung der Naturschutzpolitik in der Praxis. Die Studierenden kennen fachrelevante Regelungen des Umweltrechts und können diese auf praktische Fälle anwenden.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Waldnaturschutz (Lecture) *Contents*: Grundzüge der mitteleuropäischen Waldgeschichte und die wesentlichen Unterschiede zwischen Urwäldern, Naturwäldern und Wirtschaftswäldern hinsichtlich ihrer Lebensraumqualität und ihres Biodiversitätspotentials; räumlich-planerische Konzepte, Instrumente und Regularien sowie Möglichkeiten und Maßnahmen zum Schutz, zum Erhalt sowie zur Pflege und Entwicklung von Wäldern.	1 WLH
Course: Naturschutzpolitik (Lecture) *Contents*: Der Methodik der Politikfeldanalyse folgend werden Programme des Naturschutzes, politische Naturschutzakteure und Instrumente der politischen Steuerung und Konfliktlösung erläutert.	1 WLH
Course: Umweltrecht (Lecture) *Contents*: Grundzüge des allgemeinen Umweltrechts: Grundbegriffe und Prinzipien, Instrumente der Verhaltenssteuerung, Umsetzung des europäischen und internationalen Umweltrechts in nationales Recht. Naturschutz als Teil des Umweltschutzes und Raumordnung als Instrument des Umweltrechts werden vermittelt.	2 WLH
Examination: Written examination (120 minutes)	6 C

Examination requirements: Kenntnisse und Verständnis • ökologischer Grundlagen des Waldnaturschutzes • von Grundbegriffen der Politikfeldanalyse und deren Anwendung im Naturschutz • fachrelevanter Regelungen des Umweltrechts	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Christiane Hubo
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

cf. examination regulations	
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.212: Ecology and Politics of Forest Nature Conservation**	6 C 4 WLH

Learning outcome, core skills: Ziel ist der Erwerb vertiefter Kenntnisse zu naturschutzpolitischen Instrumenten und ökologischen Grundlagen, welche Konzepte und aktive Umsetzung von Naturschutz im Wald beeinflussen. Die Studierenden erkennen die Bedeutung waldökologischer Beziehungen auf stofflicher und organismischer Ebene für die Entwicklung eines wirkungsvollen Naturschutzes und können diese in bestehende Naturschutzstrategien einordnen. Die Studierenden erwerben zudem vertiefte Kenntnisse zu gesellschaftlichen und staatlichen Akteuren der Naturschutzpolitik sowie zu ausgewählten Steuerungsinstrumenten.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Ökologische und politische Grundlagen des Waldnaturschutzes (Seminar) *Contents*: • Zielgerichteter Umgang mit Originalliteratur zu den Themenfeldern Ökosystemforschung, Waldökologie und Stoffhaushalt, Diversität von Tieren und Pflanzen sowie Waldnaturschutz und Naturschutzpolitik • Umsetzung ökologischer Kenntnisse in Waldnaturschutzkonzepte • Handlungspotentiale der Akteure und die Potentiale der Instrumente für die Lösung von Konflikten im Waldnaturschutz	4 WLH
Examination: Referat (ca. 20 Minuten) mit schriftl. Ausarbeitung (max. 10 Seiten) **Examination prerequisites:** Regelmäßige Teilnahme	6 C

Examination requirements: • Kenntnisse und Verständnis ökologischer Grundlagen und der sich daraus ergebenden gesellschaftlichen Konfliktfelder im Waldnaturschutz • Kenntnisse und Verständnis der Rolle politischer Akteure und der Steuerungspotentiale politischer Instrumente. • Entwicklung von Präsentations- und Diskussions-Kompetenz	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Andreas Schuldt
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.213: Genetic Resources and Physiology of Wood Plants**	6 C 4 WLH

Learning outcome, core skills: Bedeutung und Konzeption des Schutzes pflanzlicher Biodiversität sowie speziell Auswahl und Erhaltung forstlicher Genressourcen, deren Nutzen und Nutzung. Bedeutung der wichtigsten Standortfaktoren für das Wachstum und die Physiologie von Bäumen.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Forstliche Genressourcen (Lecture, Exercise) *Contents*: Die Veranstaltung findet als Vorlesung statt, die nach Absprache mit den Teilnehmern von Kurzreferaten mit Bezug zu den Hausarbeitsthemen begleitet ist. Zunächst werden in der Vorlesung die allgemeine Bedeutung und Konzeptionen des Schutzes pflanzlicher Biodiversität erörtert. Daran schließt sich die ausführliche Behandlung forstlicher Genressourcen mit Auswahl und Erhaltung sowie Nutzen und Nutzung (Regeneration) an. Zum Schluss werden forstliche Genressourcen in der Gesetzgebung und in internationalen Dokumenten angesprochen.	2 WLH
Examination: Term Paper (max. 10 pages)	3 C

Course: Stressphysiologie (Lecture, Exercise) *Contents*: Der Kurs umfaßt abwechselnd Vorlesungen und Übungen zu folgenden Themen: Nährstoffe (Aufnahme, Gehalt und Verteilung der Nährstoffe in Abhängigkeit von biologischen, bodenbedingten und klimatischen Faktoren), Wasser und Kohlenstoffhaushalt (Transpiration und Photosynthese bezogen auf innere und äußere Faktoren); Wachstum und Umwelt; Resistenz gegen klimatische Faktoren. Der Kurs hat zwei Ziele: (1.) Ökophysiologisches Grundwissen zu vermitteln und (2.) die Studierenden mit praktischen Arbeitsweisen vertraut zu machen.	2 WLH
Examination: Mündliche Prüfung (ca. 15 Minuten)	3 C

Examination requirements: • Kenntnisse über den Wasser- und Kohlenstoffhaushalt (Photosynthese und Transpiration) von Pflanzen • Kenntnisse über Nährstoffaufnahme und Verteilung in Abhängigkeit abiotischer und biotischer Faktoren	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Ines Teichert
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

cf. examination regulations	
Maximum number of students: 24	

Georg-August-Universität Göttingen **Module M.Forst.214: Biodiversity**	6 C 4 WLH

Learning outcome, core skills: Die Studierenden kennen Konzepte und Inhalte moderner Biodiversitätsforschung. Sie haben theoretisches Wissen darüber erworben, welche Funktionen Biodiversität z.B. im Zusammenhang mit der Stabilität und Funktionalität von Ökosystemen erfüllt. Sie kennen methodische Ansätze und Indizes, um die Biodiversität auf unterschiedlichen Ebenen biologischer Organisation (molekular, organismisch, ökosystemar) und räumlicher Skala (lokal, regional, global) zu quantifizieren, zu analysieren und zu bewerten. Die Studierenden erwerben Kenntnisse zur prozess-basierten Modellierung und zur fortgeschrittenen statistischen Analyse von Biodiversitätsmustern.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Biodiversitätstheorien (Seminar)	1 WLH
Course: Funktionelle Biodiversität (Lecture, Excursion)	1 WLH
Course: Quantifizierung und Analyse von Biodiversität (Exercise, Seminar)	2 WLH
Examination: Klausur (120 Minuten) und unbenotete Präsentation (ca. 15 Minuten) **Examination requirements:** • Moderne Konzepte, Verfahren und Methoden der Quantifizierung und Analyse von Biodiversität kennen und anwenden • Diversitätaufnahmen planen und analysieren • Lebensweisen von Pilzen und ihre Funktionen in ihren Biotopen kennen und ableiten • Beziehungen zu anderen Organismen und Einflüsse von Pilzen auf Biodiversität erkennen und ableiten • Methoden zur Bestimmung von Pilzarten und zur genetischen Biodiversität kennen • Biodiversitätstheorien und verwandte Konzepte kennen, erläutern, anwenden und analysieren • Biodiversitätstheorien in einer Debatte erörtern • Naturschutzrelevanz von Biodiversitätstheorien kritisch beurteilen	6 C

Examination requirements: Kenntnisse über Konzepte und Inhalte moderner Biodiversitätsforschung und über Funktionen von Biodiversität im Zusammenhang mit der Stabilität und Funktionalität von Ökosystemen; Moderne Verfahren und Methoden der Quantifizierung und Analyse von Biodiversität.	

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

cf. examination regulations	
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.Forst.232: Methods and Management of Nature Conservation**	6 C 4 WLH

Learning outcome, core skills: Die Studierenden lernen den kritischen Umgang mit praktischen Methoden und Managementmaßnahmen zur Unterstützung von Naturschutzarbeit und Umsetzung planungsrelevanter Naturschutzmaßnahmen in Wäldern. Eine vertiefte Betrachtung findet statt unter anderem zu Habitatbaum- und Totholzkonzepten, FFH-Management und Monitoring sowie zu Schutzgebietsmanagement und Erholungsplanung. Methodenkenntnisse werden im Gelände erprobt und anschließend ausgewertet, Managementkonzepte werden kritisch diskutiert.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Methoden und Management im Naturschutz (Lecture, Exercise, Seminar)	4 WLH
Examination: Referat (ca. 15 Minuten) mit schriftl. Ausarbeitung (max. 10 Seiten)	6 C

Examination requirements:

- Vertieftes Wissen zur Umsetzung von Konzepten zur nachhaltigen Nutzung und Sicherung biologischer Vielfalt im Naturschutz
- Anwendung von Bewertungsmethoden und Managementkonzepten für Pflege, Entwicklung und Monitoring
- Erarbeiten wissenschaftlich fundierter Lösungsansätze zur Weiterentwicklung von Naturschutzkonzepten

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Andreas Schuldt
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.739: Basics and application of Geographic Information Systems in life sciences**	6 C 2 WLH

Learning outcome, core skills: Nach erfolgreichem Abschluss des Moduls sind die Studierenden in der Lage selbständig QGIS-Projekte und die zugehörigen Geodaten zu erstellen und zu verwalten, räumliche Analysen für Vektor- und Rasterdaten durchzuführen und wissenschaftliche Kartenlayouts anzufertigen.	**Workload:** Attendance time: 6 h Self-study time: 174 h

Course: Grundlagen und Anwendung Geografischer Informationssysteme in den Lebenswissenschaften (Exercise) *Contents*: Die Übung vermittelt grundlegende Kenntnisse zu Geographischen Informationssystemen (GIS; im Kurs QGIS) und wird als ILIAS-Selbstlernmodul angeboten. Das Lernmodul umfasst Hintergrundinformationen, Übungsaufgaben sowie Wissen zur praktischen Durchführung der Übungen in QGIS. Die Wissensvermittlung erfolgt mittels erläuternder Texte sowie kurzer Videosequenzen. Die Studierenden erwerben Kenntnisse und Kompetenzen • zur Anlage und Administration von GIS-Projekten, • zu Datenformaten und -management (Raster-/Vektordaten) • zu Datenquellen und -generierung (Digitalisierung, mobiles GIS, Online-Quellen wie WMS-/WFS-Dienste, etc.), • zum Umgang und der Arbeit mit Vektorattributdaten, • zur räumlichen Analyse von Vektor- und Rasterdaten, • zu Koordinatenbezugssystemen, • zu Symbologie-Optionen von Vektor- und Rasterdaten, sowie • zur Erstellung wissenschaftlicher Karten.	2 WLH
Examination: Written examination (90 minutes)	6 C

Examination requirements: Nachweis von Hintergrund- sowie Praxiswissen zu Geografischen Informationssystemen (QGIS): Projekterstellung und -verwaltung, Datenformate, -quellen und -generierung, *Handling* von Vektorattributdaten, räumliche Analysen von Vektor- und Rasterdaten, Koordinatenbezugssysteme, *Layout*-Optionen	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Inga Schmiedel
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**

Maximum number of students: 40	

Additional notes and regulations:

Dieses Modul kann nicht von Studierenden des Schwerpunktes "Waldnaturschutz" belegt werden.

Sobald das Modul M.Forst.739 erfolgreich absolviert wurde, kann das Modul M.Forst.221 nicht mehr belegt werden.

Georg-August-Universität Göttingen **Module M.Forst.742: Forest Ecosystems and Their Management**	6 C 4 WLH

Learning outcome, core skills: In mehreren Exkursionen und einem Seminar werden Eigenschaften, natürliche Dynamik, Biodiversität und Dienstleistungen von naturnahen Wäldern innerhalb eines Bewirtschaftungsintensitätsgradienten erarbeitet und in Beziehung zum waldbaulichen Management gesetzt. Die räumliche Skala ist dabei neben der Bestandesebene auch die Waldlandschaft.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Waldökosysteme und ihre Bewirtschaftung (Excursion, Seminar) *Contents*: Kern der Veranstaltung ist eine mehrtägige Exkursion mit Geländeübungen im nordostdeutschen Tiefland, um beispielhaft mehr oder weniger naturnah bewirtschaftete sowie unbewirtschaftete Wälder, ihre standörtlichen Gegebenheiten und regionale Konzepte ihrer waldbaulichen Behandlung kennen zu lernen. Diskussionen mit Fachleuten vor Ort und Literaturarbeit zu den entsprechenden Übungsthemen vertiefen die Kenntnisse. In einem abschließenden Seminar und einer eintägigen Exkursion wird der regionale und thematische Bezug erweitert. Die erworbenen Kenntnisse in der Waldökologie (einschließlich forstlicher Standorts- und Vegetationskunde, Ökosystem- und Diversitätsforschung) sowie zu waldbaulichen Verfahren werden eingesetzt, um Chancen und Risiken der Waldbewirtschaftung zu erörtern.	4 WLH
Examination: Referat (ca. 15 Min.) mit schriftlicher Ausarbeitung (max. 15 Seiten)	6 C

Examination requirements: Erörterung von Konzepten einer naturnahen Waldbewirtschaftung und Diskussion deren Effekte auf Dienstleistungen und Biodiversität auf der Grundlage der Lehrinhalte der Exkursionen unter Verwendung wissenschaftlicher Literatur.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Peter Schall
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: 14	

Georg-August-Universität Göttingen **Module M.Forst.754: Soils of the Earth: Distribution, Characteristics and Use**	6 C 4 WLH

Learning outcome, core skills: Vertiefende Kenntnisse über die Geologie, Geomorphologie und Bodenbildung, Bodeneigenschaften und Bodennutzung der Wichtigsten Ökozonen der Erde. Lösung praktische Landnutzungsprobleme die typisch für die Bodennutzung in den unterschiedliche Ökozonen sind und oft mit biogeochemische Kreisläufe zusammenhängen.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Böden der Welt: Verbreitung, Eigenschaften und Nutzung (Lecture, Exercise) *Contents*: Die Veranstaltung vermittelt theoretische und praktische Kenntnisse über die Geologie, Geomorphologie und Bodenbildung, Bodeneigenschaften und Bodennutzung der Wichtigste Ökozonen der Erde: Polare und subpolare Zone (Tundra); Boreale Zone (Taiga); Feuchte Mittelbreiten (gemäßigte Zone); Trockene Mittelbreiten (Steppengebiete); Winterfeuchte Subtropen (Mediterrangebiete); Trockene Tropen und Subtropen (Wüstengebiete); Sommerfeuchte Tropen (Savannengebiete); immerfeuchte Subtropen (Ostseitengebiete); immerfeuchte Tropen (Regenwaldgebiete) und Gebirgsregionen. Im Seminar werden Probleme vorgetragen die typisch für die Bodennutzung/Biogeochemische Kreisläufe in den unterschiedliche Ökozonen.	4 WLH
Examination: Referat (ca. 10 Minuten) mit schriftl. Ausarbeitung (max. 10 Seiten) und mündliche Prüfung (ca. 15 Minuten)	6 C

Examination requirements: Präsentation eines Referats zu einem ausgewählten Thema aus dem Bereich Bodenkunde; vertiefte Kenntnisse über die Verbreitung, Genese, Eigenschaften und Nutzung der Böden Weltweit.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Edzo Veldkamp
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.756: Practice in Soil Hydrology**	9 C 6 WLH

Learning outcome, core skills: Es sollen die Grundlagen der Wasserspeicherung und des Wassertransportes in Böden vermittelt werden. Dabei wird der Schwerpunkt auf Messprinzipien der bodenphysikalischen Kenngrößen in Feld- und Laborsituationen gelegt. Die Studierenden sollen in Kleingruppen Versuche zur Bestimmung des Wasserpotentiales, des Wassergehalts, der pF-Kurven, der hydraulischen Leitfähigkeit unter gesättigten und ungesättigten Bedingungen und des Transportverhaltens gelöster Stoffe durchführen. Lernziele sind: • Erlernen und Anwendung grundlegender bodenphysikalischer Messmethoden • Erfassung bodenhydrologischer Kenngrößen sowie • Bewertung der Ergebnisse im ökologischen Zusammenhang	**Workload:** Attendance time: 84 h Self-study time: 186 h

Course: Bodenhydrologische Übung (Lecture, Exercise)	6 WLH
Examination: Protokolle (max. 50 Seiten)	9 C

Examination requirements: Vertiefte Kenntnisse der bodenhydrologischen Charakterisierung von Böden und Verständnis bodenphysikalischer Zusammenhänge. Methodische Fertigkeiten im Bereich bodenhydrologischer Analytik. Bewertung und Interpretation von Messergebnissen.	

Admission requirements: Grundlegende Kenntnisse in Bodenkunde	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Martin Jansen
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.Forst.757: Practice in Soil Microbiology**	9 C 6 WLH

Learning outcome, core skills: Anwendung bodenmikrobiologischer Methoden. Berechnung und statistische Auswertung bodenmikrobiologischer Parameter und Prozessraten. Bewertung der Ergebnisse in einem holistisch-ökosystemaren Zusammenhang.	**Workload:** Attendance time: 84 h Self-study time: 186 h

Course: Bodenmikrobiologische Übung (Exercise) *Contents*: Die TeilnehmerInnen werden in der Anwendung verschiedener bodenmikrobiologischer Methoden angeleitet, die der Erhebung ökosystem-relevanter Parameter und Prozessraten dienen. Vor dem Hintergrund globaler Umweltveränderungen soll der Einfluss verschiedenster Umweltfaktoren (z.B. Landnutzung, Temperatur, Nährstoffverfügbarkeit) auf die bodenmikrobiologischen Parameter und Prozessraten untersucht und ausgewertet werden. Dabei lernen die TeilnehmerInnen mikrobielle Stoffwechselprozesse kennen und mikrobielle Stoffwechselprodukte sowohl in der Gas- als auch Flüssigphase zu detektieren und zu quantifizieren. Mithilfe statistischer Methoden, die eine Analyse und Bewertung sowohl molekularer als auch öksystemarer Prozesse und deren Interaktion erlauben, werten die TeilnehmerInnen die selbstständig erhobenen Daten aus, präsentieren die Ergebnisse graphisch und interpretieren sie in einem holistisch-ökosystemaren Kontext. Außerdem erlenen die TeilnehmerInnen, wissenschaftliche Originalliteratur auf dem Gebiet der Bodenmikrobiologie zu verstehen und Ihren Inhalt schriftlich zusammen zu fassen.	6 WLH
Examination: Protokoll (max. 15 Seiten)	9 C

Examination requirements: Wissen mikrobieller Stoffwechselprozesse und Kenntnisse verschiedener bodenmikrobiologischer Methoden und deren Anwendung, um Auswirkungen mikrobieller Stoffwechselprozesse auf molekularer Ebene auf ökosystemare Stoffflüsse im Boden-Pflanze-Atmosphäre Kontinuum untersuchen zu können. Recherche und kritische Auseinandersetzung mit wissenschaftlich-bodenmikrobiologischer Fachliteratur und deren Präsentation.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Marife Corre
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students:	

not limited	

Georg-August-Universität Göttingen **Module M.Forst.772: Conflicts and Management in Nature Conservation Policy**	6 C 2 WLH

Learning outcome, core skills: Die Studierenden lernen, theoretische Begriffe und Analyseinstrumente auf politische Konflikte im Naturschutz anzuwenden. Sie erwerben die Kompetenz, aktuelle Konflikte und Handlungspotentiale von Akteuren zu analysieren und auf dieser Grundlage konkrete Lösungsvorschläge zu entwickeln. Damit erhöhen sie ihre eigenen Konflikt-, Handlungs- und Analysefähigkeiten. Diese sind sowohl in der forst- und naturschutzpolitischen Praxis als auch in der Forschung gefragt.	**Workload:** Attendance time: 28 h Self-study time: 152 h

Course: Naturschutzpolitische Konflikte und Lösungsansätze (Seminar) *Contents*: Die Studierenden erarbeiten selbständig unter Anleitung Fallstudien zu ausgewählten naturschutzpolitischen Konflikten und setzen dabei Methoden der empirischen Sozialforschung ein. Die Fallstudien werden schriftlich ausgearbeitet und im Plenum vorgestellt und besprochen. Optional können auch Planspiele als Hilfsmittel zum Verständnis der Konflikte und zur Lösungsfindung eingesetzt werden.	2 WLH
Examination: Term Paper (max. 20 pages) **Examination prerequisites:** Referat (20 Minuten, unbenotet)	6 C

Examination requirements: Fähigkeit zur Analyse von naturschutzpolitischen Konflikten und Handlungspotentialen sowie zur Entwicklung von Lösungsvorschlägen. Schriftliche Darstellung der Analyse in wissenschaftlicher Form.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Christiane Hubo
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: 12	

Additional notes and regulations:
Das Seminar ist dafür geeignet, die Anfertigung einer Masterarbeit einzuüben und vorzubereiten.

Georg-August-Universität Göttingen **Module M.Forst.774: Stable Isotopes in Terrestrial Ecology**	6 C 4 WLH

Learning outcome, core skills: Verständnis grundlegender Aspekte der analytischen Ansätze und des chemischen und physikalischen Hintergrunds für die Anwendung stabiler Isotope in der ökologischen Prozessforschung. Bewertung der Möglichkeiten und Grenzen des Einsatzes stabiler Isotopen in Feld- und Laborstudien.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Stabile Isotope in der terrestrischen Ökologie (Lecture, Exercise) *Contents*: Das Modul führt die Studierenden in die grundlegenden Aspekte der analytischen Ansätze und den chemischen und physikalischen Hintergrund für Anwendungen stabiler Isotope in der Ökosystemwissenschaft ein. Aktuelle Anwendungen von Isotopentechniken in der ökolischen Forschung werden diskutiert. Die Studierenden werden aktuelle wissenschaftliche Studien mit dem Schwerpunkt Anwendung und Auswertung stabilisotopischer Analysen vorstellen und bewerten.	4 WLH
Examination: Referat (ca. 15 Minuten) mit schriftl. Ausarbeitung (max. 15 Seiten)	6 C

Examination requirements: Kenntnis der wichtigsten Grundlagen für die Anwendung stabilisotopischer Methoden in der ökologischen Forschung (Isotopenfraktionierung, Messmethoden, Vermeidung von Anwendungsfehlern). Präsentation einer wissenschaftlichen Publikation mit Schwerpunkt Anwendung und Auswertung stabilisotopischer Analysen.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Jens Dyckmans
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module M.Forst.775: Modern Methods in Ecology**	6 C 4 WLH

Learning outcome, core skills: Einführung in Methoden der Ökophysiologie und Physiologie, Analyse von Diversität,	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Ökophysiologie (Lecture, Exercise) *Contents*: Durch Übungen, die von Vorlesungen begleitet werden, werden die Studierenden mit praktischen Methoden der Ökologie vertraut gemacht, z.B. Bestimmung von osmotischem Druck, Wasserpotential, Photosynthese, Chlorophyllfluoreszenz, uvm. Es werden eigene Versuchsreihen durchgeführt, um anhand der erlernten Methoden, den Vitalitätszustand von Pflanzen zu beurteilen.	2 WLH
Course: Diversität (Lecture, Exercise) *Contents*: Innerhalb der Ökologie sind Diversitätsstudien eine wichtige Analyse, um den Artenreichtum innerhalb unterschiedlicher Ökosysteme abzuschätzen und Auswirkungen von Umweltfaktoren auf eine Organismengesellschaft zu verstehen. In diesem Kurs wird theoretisches Wissen zu Biodiversität, Biodiversitätsindizes und Mykorrhiza vermittelt. Im praktischen Teil werden Wurzelproben auf die Mykorrhiza-Pilz-Gesellschaften hin analysiert. Hierbei kommen sowohl mikroskopische Analysen zum Einsatz als auch DNA-Isolation und die Auswertung von einfachen Sequenzdaten. Mithilfe von R werden die Ergebnisse statistisch untersucht .	2 WLH
Examination: 2 Protokolle (á max. 10 Seiten, 50%) und mündliche Prüfung (ca. 15 Minuten, 50 %)	6 C

Examination requirements:	
• Kenntnisse über wichtige ökophysiologische Parameter • Selbstständige Bestimmung ökophysiologischer Parameter mit den dafür geeigneten Messgeräten • Exakte Dokumentation von Messdaten • Interpretation der Messwerte auf wissenschaftlicher Basis	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Ines Teichert
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: cf. examination regulations	**Recommended semester:**

Maximum number of students: 24	

Georg-August-Universität Göttingen **Module M.Geg.02: Resource Utilisation Problems**	6 C 4 WLH

Learning outcome, core skills: Die Studierenden können die Bedeutung der Ressourcen Boden und Wasser als Bestandteile von Ökosystemen und Lebensgrundlage des Menschen aufzeigen und das globale sowie regional differenzierte Ausmaß der Gefährdung und Degradation dieser Ressourcen benennen. Sie sind in der Lage, das DPSIR-Konzept, durch das die Beziehungen Drivers – Pressures – State – Impacts – Responses verdeutlicht werden können, auf verschiedene Ressourcennutzungsprobleme anzuwenden. Sie kennen die Reference Soil Groups der World Reference Base for Soil Resources, sowie die spezifischen Bodeneigenschaften und daraus resultierenden Nutzungsmöglichkeiten, –einschränkungen und Gefährdungen der verschiedenen Böden. **Modulinhalte:** Eigenschaften, Nutzungsmöglichkeiten und –probleme verschiedener Böden (mit Schwerpunkt auf feuchte Tropen und Subtropen sowie Trockengebiete), Bodengefährdungen, Faktoren und Prozesse der Bodendegradation, Ursachen, Ausmaß und Arten der Bodendegradation in Europa, Desertifikation, regional differenzierte Auswirkungen des Klimawandels auf die Ressourcen Boden und Wasser, globale Verteilung von Wasserangebot und –nachfrage, Wasserverbrauch nach Sektoren, Wassermangel, Ursachen und Ausmaß von Problemen mangelnder Wasserqualität, regionale Unterschiede in der Versorgung mit sanitären Anlagen und sauberem Trinkwasser.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Ressourcennutzungsprobleme (Lecture)	2 WLH
Course: Ressourcennutzungsprobleme (Seminar) Inkl. Geländetage zur Bearbeitung einer Fragestellung im Rahmen eines kleinen Projekts.	2 WLH
Examination: Written examination (90 minutes) **Examination prerequisites:** Regelmäßige Teilnahme am Seminar; Referat mit schriftl. Ausarbeitung bzw. schriftlichem Beitrag zum Projektbericht oder Poster (ca. 30 Min., max. 20 S. bzw. 1 DIN A 0 Poster) **Examination requirements:** Die Studierenden erbringen den Nachweis, dass sie Probleme der Boden- und Wassernutzung überblicken und spezifische Degradationsursachen sowie -prozesse verstehen. Sie zeigen, dass sie geeignete situationsbezogene Verfahren des nachhaltigen Umgangs mit Böden und Wasser kennen. Die Erstellung des Beitrags zum Projektbericht oder die Postererstellung als Prüfungsvorleistung machen die Mitwirkung bei der Projektbearbeitung erforderlich.	6 C

Admission requirements:	**Recommended previous knowledge:**
none	Grundlagen der Bodengeographie

Language: German	**Person responsible for module:** Prof. Dr. Daniela Sauer
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 2
Maximum number of students: 42	

Georg-August-Universität Göttingen **Module M.Geg.06 (Biodiv): Quaternary Climate and Landscape Evolution**	6 C 3 WLH

Learning outcome, core skills: Die Studierenden kennen die Grundzüge der quartären Klima- und Landschaftsentwicklung global und in Mitteleuropa. Sie verstehen die Wirkungsweisen verschiedener Steuergrößen auf die Klima- und Landschaftsentwicklung und deren Relevanz für gegenwärtige und künftige Dynamiken. Die Studierenden haben einen Überblick über Archive der Landschaftsentwicklung und darin enthaltene Proxies, die zur Rekonstruktion der Klima- und Landschaftsgeschichte herangezogen werden können. Sie sind mit den wichtigsten in der Quartärforschung zum Einsatz kommenden Untersuchungsmethoden und Datierungsverfahren vertraut.	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Landschaftsentwicklung (Lecture)	1 WLH
Course: Archive und Proxies zur Rekonstruktion der Landschaftsentwicklung (Seminar)	2 WLH
Examination: Referat (ca. 30 Min.) mit schriftlicher Ausarbeitung (max. 20 S.) ODER Referat (ca. 30 Min.) mit mündlicher Prüfung (ca. 20 Min.) **Examination prerequisites:** Regelmäßige Teilnahme am Seminar, Erstellung eines Posters (DIN A0 oder A1) zu einer selbst gewählten Datierungsmethode mit Postervorstellung (ca 10 Min.) im Seminar	6 C

Examination requirements: Die Studierenden erbringen den Nachweis, dass sie die Bedeutung von Archiven und Proxies im Kontext der Rekonstruktion der Klima- und Landschaftsentwicklung verstanden haben und dass sie in der Lage sind, unter Einbindung englischsprachiger Primärliteratur die Relevanz der vergangenen Klima- und Landschaftsentwicklung wissenschaftlich adäquat darzustellen. Anhand eines selbst gewählten Archivs und eines selbst gewählten Proxies aus diesem Archiv erbringen sie weiterhin den Nachweis, dass sie in der Lage sind, anhand geeigneter Primärliteratur Stärken und Schwächen von Archiven und Proxies herauszuarbeiten und kritisch zu reflektieren.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Elisabeth Dietze
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students: 5	

Georg-August-Universität Göttingen **Module M.Geg.17: Landscape Ecology**	6 C 4 WLH

Learning outcome, core skills: The students know the components of element, water and energy budgets and fluxes in landscapes, and the most important element cycles. They are familiar with assessing soil properties and soil distribution patterns in landscapes, and with the measurement of microclimatic parameters. The students are able to generate hypotheses on the mutual relationships relief-soils-microclimate, to develop appropriate strategies for testing their hypotheses and to apply them in practice. The students have the competency to work on a research question in small international, culturally diverse teams, in a creative and outcome-oriented way. Thereby, they appreciate diverse cultural backgrounds and different approaches to handle a task. They are able to reflect on these in a constructive way and to jointly develop strategies for solving their research questions.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Landscape-ecological methods (Lecture)	1 WLH
Course: Landscape-ecological theory (Lecture)	1 WLH
Course: Landscape-ecological project (Seminar) with project-type components to be carried out in small international teams including measurements in the field.	2 WLH
Examination: Presentation (ca. 30 Min.) with written report (max. 20 p.) or DIN A 0 poster **Examination prerequisites:** Presentation (ca. 30 Min.) with written report (max. 20 p.) or DIN A 0 poster	6 C

Examination requirements: The students proof that they are able to generate hypotheses on the mutual relationships relief-soils-microclimate, to develop appropriate strategies for testing their hypotheses, considering different perspectives, and to apply them in practice. They proof that they can collaborate in an international team, interpret, document, present, discuss their results, and critically reflect the applied methods and obtained outcomes.	

Admission requirements: None	**Recommended previous knowledge:** None
Language: English	**Person responsible for module:** Prof. Dr. Daniela Sauer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students:	

20	

Additional notes and regulations:

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Georg-August-Universität Göttingen **Module M.Geo.114: Biogeochemistry**	6 C 6 WLH

Learning outcome, core skills: Das Modul vermittelt vertiefte Kenntnisse der Biogeochemie und der organischen Geochemie. Neben den Prozessen im organischen Kohlenstoffkreislauf und beim frühdiagenetischen Abbau organischen Materials erlernen die Teilnehmer geochemische, fazielle und geologische Hintergründe der Lagerstättengenese von Erdöl, Kohle und Erdgas. Zudem werden sowohl erdgeschichtliche Bezüge als auch Umweltaspekte herausgearbeitet. In den Laborübungen werden grundlegende Analysetechniken wichtiger organischer Substanzklassen in biologischen und geologischen Proben erlernt (C-N-S Analyse, GC, GC/MS, HPLC). Neben Grundlagenaspekten (Paläoumwelt, Umsetzung biogener Elemente) bilden die Erdölexploration (Korrelation und Bewertung von Ölen und Muttergesteinen) und die Umweltanalytik (org. Schadstoffe in Böden und Grundwässern) zentrale Praxisbezüge. Die erworbenen Kenntnisse liefern den Teilnehmern über das Studium hinaus eine Basis zur Bewertung organisch-geochemischer Daten.	**Workload:** Attendance time: 84 h Self-study time: 96 h

Course: Biogeochemie (Lecture, Seminar)	3 WLH
Course: Laborübung zur Biogeochemie (Exercise) Die Lehrveranstaltung wird als Blockkurs durchgeführt	3 WLH
Examination: Präsentation (ca. 20 Min.) mit schriftlicher Ausarbeitung (max. 10 Seiten) **Examination prerequisites:** Schriftlicher Bericht (max. 10 Seiten) zu LV 2; regelmäßige Teilnahme an der Laborübung	6 C

Examination requirements: Kohlenstoffkreislauf, organische Substanzen, Entstehung und Zusammensetzung von Erdöl, Kohle, und Erdgas, organische Grundwasserschadstoffe, organisch-geochemische Analysemethoden	

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Volker Thiel
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** from 1
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module M.INC.1005: Population biology in nature conservation**	6 C 8 WLH

Learning outcome, core skills: Study of the methodology of an endangerment analysis (population viability analysis, PVA) of an animal species (case study partridge). The students determine causes of endangerment and develop options for the nature conservation in the cultural landscape. The students transfer empirically collected own data and data from the literature to a population model and develop a modeling of an endangered animal population. Core skills: collection and analysis of field data; use of population models; development of management options for an endangered animal species; knowledge of the telemetry as an important method for the registration of movement patterns of vertebrates.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Population viability analysis (Lecture)	
Course: Population viability analysis (Exercise)	
Examination: Assignment (max. 20 pages) **Examination prerequisites:** Presentation (15 min)	6 C

Examination requirements: Knowledge of the potential endangerment of specific animal species and measures for their protection in the cultural landscape. Modeling of endangered animal populations.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Eckhard Gottschalk
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:** 1
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module M.INC.1006: Data analysis for field biologists**	6 C 8 WLH

Learning outcome, core skills: In this module, we provide an introduction to data analysis in the R programming environment. We cover data collection and organization, sampling designs in observational studies and statistics. We will work with a collection of field datasets, while also introducing how to find and work with open-access ecological and environmental data. We visualize our data throughout and develop skills in reproducible coding and version control. The course participants will learn how to use classical hypothesis testing, linear regression and Generalized (mixed) linear models. If progress allows, we will introduce models that can be used to correct for varying detection probability and approaches to extract, analyses and visualize spatial data. Students will learn how to use data science tools to address research questions, implement version control to back up work, code collaboratively and write reproducible workflow reports. Core skills acquired: Ability to organize, transform and process data in R, ability to critically judge sources of bias resulting from data collection and analysis, ability to choose appropriate tools for the analysis of different types of data (e.g., categorical vs. continuous variables), skills to graphically present key messages, ability to report and interpret statistical results.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Data analysis for field biologists (Lecture)	5 WLH
Course: Data analysis for field biologists (Exercise)	3 WLH
Examination: Assignments (max. 25 pages)	6 C

Examination requirements: Participants understand data structures and are able to organize, visualize and summarize data. They can judge on the quality of sampling designs, can apply statistical models, can use the R language to create and execute reproducible workflows, are able to troubleshoot code errors and write efficient and well-annotated code. They can visualize data and models, and are able interpret and report statistical results.	

Admission requirements: none	**Recommended previous knowledge:** No previous knowledge of R and R Studio is required. Basic skills of organizing and processing data in spreadsheet programs such as Excel are useful.
Language: English	**Person responsible for module:** Prof. Dr. Johannes Kamp Dr. Gergana Daskalova
Course frequency: each winter semester; (Block course)	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

twice	1
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module M.INC.1007: Assessment of wildlife species for nature conservation**	6 C 8 WLH

Learning outcome, core skills: Population monitoring of endangered species is an essential component of adaptive conservation management. Therefore, students need to acquire basic theoretical and practical knowledge of population assessment and monitoring of animal populations. Graduates of the course will be able to design, conduct and analyze surveys that allow precise and defensible population estimates. In the module, the theoretical basics for quantitative surveys are taught, and practical experience in designing and conducting wildlife surveys is presented. The understanding of concepts such as strip width, cluster size, encounter rate, detection probability, as well as the influence of these variables on the estimation of population density/abundance and their variance will be taught. In the exercise part, concrete data will be analyzed using the Distance Sampling framework (e.g. Buckland et al. 2001). Line transect data of vertebrates (birds, primates, other large mammals) from tropical habitats (savannah and forest) are made available.	**Workload:** Attendance time: 112 h Self-study time: 68 h

Course: Theoretical background of population assessment (Lecture)	2 WLH
Course: Analysis, interpretation and communication of population data (Exercise)	6 WLH
Examination: Minutes / Lab reportMinutes / Lab report (max. 20 pages) **Examination prerequisites:** Oral presentation (ca. 15 minutes)	6 C

Examination requirements: Basics of adaptive conservation management and knowledge of the realization of wildlife surveys. Basics on survey design and practice-oriented estimation of wildlife populations.	

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. rer. nat. Matthias Waltert
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 20	