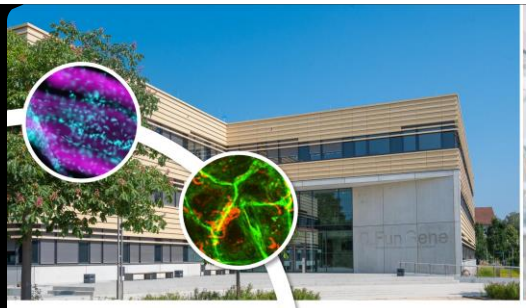
M.Sc. BIODIVERSITY, ECOLOGY AND EVOLUTION



UNIVERSITÄT GREIFSWALD
Wissen lockt. Seit 1456

Study program structure

Basic module B1: Basics of Biodiversity, Ecology & Evolution

Basic module B2: Research and Collection Management

Basic module B3: Research Internship

Basic module B4: Personal profiling

10 Elective modules: +/- free choice out of more than 40 modules

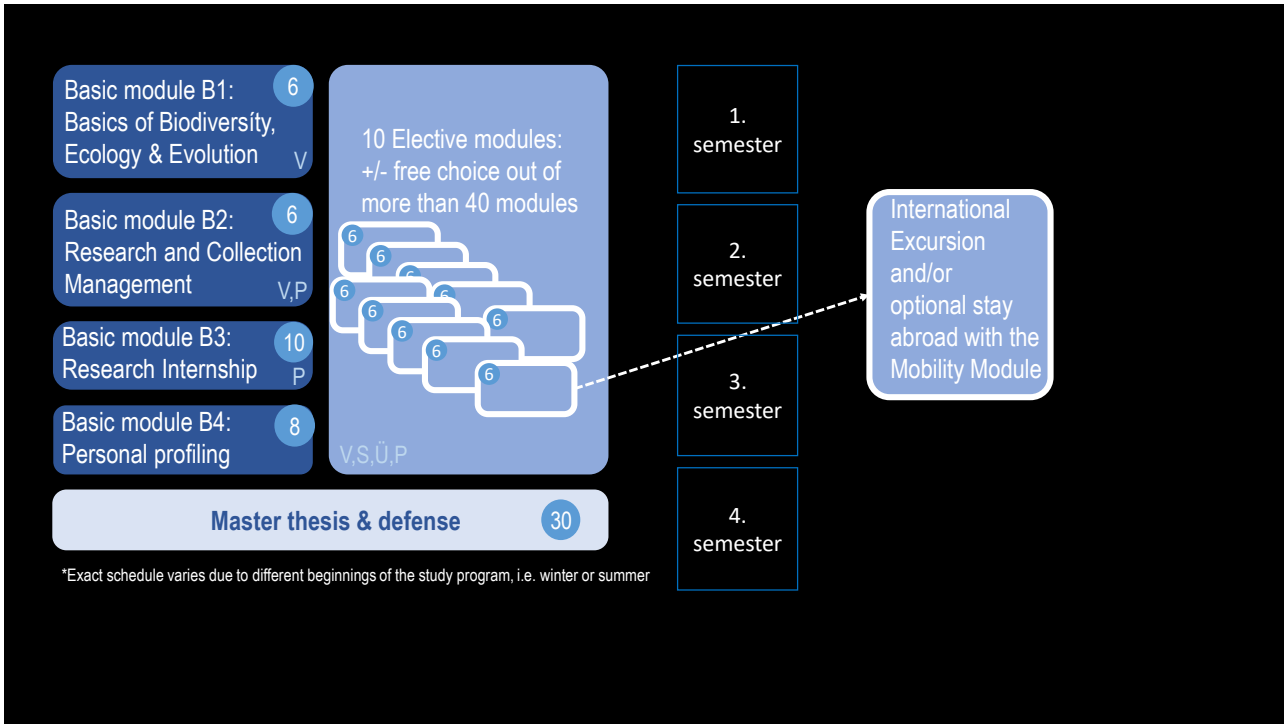
International Excursion and/or optional stay abroad with the Mobility Module

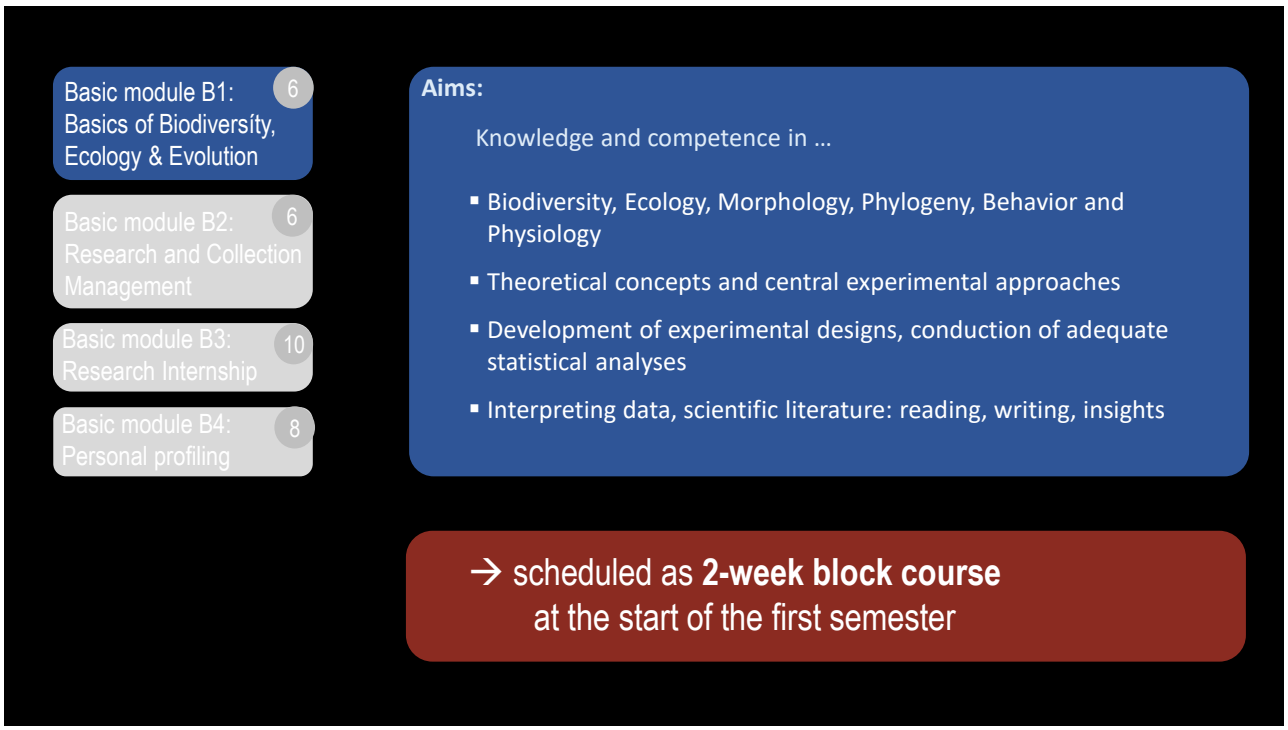
Master thesis & defense

https://biologie.uni-greifswald.de/studium-und-lehre/msc-studiengaenge/msc-Biodiversity-Ecology-and-Evolution/

Subject

- Research-oriented Master's program in Biodiversity, Ecology and Evolution
- open to qualified graduates of life science programs
- Aim: Specialist knowledge in the fields of:
  Biodiversity, Ecology, Evolution,
  Morphology, Nature Conservation,
  Behavior, Microbiology and Physiology
- Special emphasis on methodological & conceptual aspects


Basic module B1: Basics of Biodiversity, Ecology & Evolution 6 V
Basic module B2: Research and Collection Management 6 V,P
Basic module B3: Research Internship 10 P
Basic module B4: Personal profiling 8
10 Elective modules: +/- free choice out of more than 40 modules
V,S,Ü,P
Master thesis & defense 30
1. semester
2. semester
3. semester
4. semester
International Excursion and/or optional stay abroad with the Mobility Module
*Exact schedule varies due to different beginnings of the study program, i.e. winter or summer


Basic module B1: Basics of Biodiversity, Ecology & Evolution 6
Basic module B2: Research and Collection Management 6
Basic module B3: Research Internship 10
Basic module B4: Personal profiling 8
Aims:
Knowledge and competence in …
Biodiversity, Ecology, Morphology, Phylogeny, Behavior and Physiology
Theoretical concepts and central experimental approaches
Development of experimental designs, conduction of adequate statistical analyses
Interpreting data, scientific literature: reading, writing, insights
→ scheduled as 2-week block course at the start of the first semester

Basic Module B1 - Summer Semester 2025 — version 2.0 (2025.02.11)

SoSe

	1. week, starting from: 07.04.2025					2. week, starting from: 14.04.2025					
	07.04.2025 Mon	08.04.2025 Tue	09.04.2025 Wed	10.04.2025 Thu	11.04.2025 Fri	14.04.2025 Mon	15.04.2025 Tue	16.04.2025 Wed	17.04.2025 Thu	18.04.2025 Fri	Fri, 25.4. ? Fri, 9.5. ?
14:15	Wacker: Introduction, Basics in Ecology all lectures in Seminar Room 232, Soldmannstr. 23	Uhl: Evolution, Natural and Sexual Selection	Uhl: Fitness, Phenotypic Plasticity, Heritability	van Schaik: Conservation Genetics & Behavioural Biology	Kerth: Conservation Behaviour	Lehmann: Environmental Physiology and Adaptation to Environmental Changes all lectures in Seminar Room 232, Soldmannstr. 23	Haase: Molecular Phylogenetics	Harzsch: Ecological developmental biology and epigenetics	Wacker: Biodiversity & Synecology -&- final remarks	- Karfreitag - no - lecture !	Wacker: Basic Module - 1 - Progress-Test Seminar Room 228, Soldmannstr. 23
15:00											
16:00						Michalik: Evolutionary Morphology		Wacker: Population Ecology			
17:00							- - - 17°° Zoological Colloquium				

→ scheduled as **2-week block course** at the start of the first semester

- Basic module B1: Basics of Biodiversity, Ecology & Evolution — 6
- Basic module B2: Research and Collection Management — 6
- Basic module B3: Research Internship — 10
- Basic module B4: Personal profiling — 8

Lecture „Biodiversity, Ecology and Physiology, Evolution, Morphology and Phylogeny"

- Introducton to population ecology & synecology
- Introduction to conservation ecology, conservation genetics & behavioural biology
- Environmental physiology, physiological of sensory information and adaptation to environmental changes
- Evolution, natural and sexual selection, fitness, phenotypical plasticity, heritability
- Backbones of morphology
- Molecular phylogenetics

Only in winter semester, allways Wednesday:

Lecture & Exercises „Experimental Design & Analysis "

- Experimental designs such as block designs, split plot designs, coordinated distributed experiments, gradient experiments
- ANOVA and regression analyses in linear and mixed models

- Basic module B1: Basics of Biodiversity, Ecology & Evolution — 6
- **Basic module B2: Research and Collection Management — 6**
- Basic module B3: Research Internship — 10
- Basic module B4: Personal profiling — 8

Aims: Competent knowledge

- Collecting, managing study organisms, obtaining research data addressing the following :
  - Permits needed to collect and use study organisms
  - Ethical regulations
  - Storing and labelling
  - Documentation and digization
  - Requirements for morphological, molecular and behavioral studies
  - Basic knowledge in collection-based techniques and data management

→ scheduled for the summer semester !
Includes "the Scientific Approaches to Knowledge", see next slide!

- Basic module B1: Basics of Biodiversity, Ecology & Evolution — 6
- **Basic module B2: Research and Collection Management — 6**
- Basic module B3: Research Internship — 10
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Lecture/Exercises: „Basic Principles in Research and Collection Management"

Theoretical

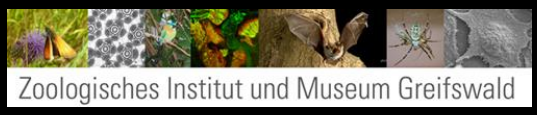
- collecting of study organisms: permits (collection, import/export), sampling methods and its impacts, quantities
- access – benefit sharing for collected material: basics of Nagoya regulations and how to apply for permits
- ethics involved in using collected organisms | animal welfare for laboratory experiments
- voucher management: short- and long-term storage, labelling (e.g. what information needs to be on a scientific label), digitization of vouchers (introduction in collection management software and metadata, introduction into georeferencing, introduction into imaging of specimens)
- E-Lab: Documenting and managing laboratory experiments
- DNA-analyses, management of sequence data, tissue storage, etc
- Museum: collection types, outreach
- Citizen science

Practical

- Voucher management | Natural History collections in Greifswald and Stralsund: Imaging of different types of organisms, Introduction into the Database for voucher management
- E-Lab and its implementation in laboratory experiments
- Animal welfare: applications for lab- and field-based research
- Outreach: excursion to the German Oceanographic Museum (Meeresmuseum) Stralsund

Lecture: „Scientific Approaches to Knowledge"

Acquisition of knowledge, data interpretation, literature search, publication process, scientific writing and presenting



Scientific Approaches to Knowledge

takes place Mondays, **8:15**-9:00 am in the summer semester
(Zoological Institute and Museum, HS Zoologie/Botanik, Loitzer Straße 26)

Date	Topic	Lecturer
1st Monday of Semester, 8:15	Historical fundaments of science	Prof. Dr. Michael Schmitt
Exact schedule will follow	Hypothetico-Deductivism	Prof. Dr. Michael Schmitt
…	Ways to acquire knowledge	Prof. Dr. Michael Schmitt
…	Practicing statistics 1: Basics of experimental design	Prof. Dr. Gabriele Uhl
…	Practicing statistics 2: R: Data inspection and visualisation	Dr. Andreas Fischer
…	Practicing statistics 3: R. How to pick the correct test	Dr. Alexander Scheuerlein
…	Practicing statistics 4: R. Useful tests	Dr. Alexander Scheuerlein
…	Practicing statistics 5: R. GLMs	Dr. Alexander Scheuerlein
…	Scientific writing	Prof. Dr. Alexander Wacker
…	How to conclude (e.g., by analogy): limits and risks	Prof. Dr. Gerald Kerth
…	Publishing in science, bibliometrics	Prof. Dr. Steffen Harzsch
…	Animals as study object: ethics and legal questions	PD Dr. Christian Müller

- Basic module B1: Basics of Biodiversity, Ecology & Evolution — 6
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Aims:

Advanced knowledge

- … with regard to a concrete case study/research task
- … and skills for independent scientific working, writing

including:

- Designing a study to solve a given task
- Introduction to the study of literature
- Independent implementation of a research project of limited scope
- Evaluation, presentation, discussion, writing of own results

→ Talk to potential supervisors in the working groups, where you did your elective modules !
If you would like to do external internships, you still will need a supervisor at the University of Greifswald !

→ Note: you have to register for the exam during the usual registration times for the exams !!! Do not forget about this ! ! !

Basic module B1: Basics of Biodiversity, Ecology & Evolution 6

Basic module B2: Research and Collection Management 6

Basic module B3: Research Internship 10

Basic module B4: Personal profiling 8

2

Possible courses for your personal profiling

- Visit of the colloquium series of the Department of Biology, e.g. "Planet Earth 3.0" or the Summer Colloquium of the Institute of Zoology
- Courses in:
  - scientific writing, presentation, and rhetoric
  - science management
  - statistics
  - law (e.g. environmental law)
  - nature conservation economics
  - nature ethics
  - sustainability
- Nature conservation internships, internships abroad in the life sciences
- Attendance of national/international scientific workshops/conferences
- Courses from the BSc Biology, BSc or MSc Landscape Ecology of the University Greifswald, thematically related to the MSc Biodiversity, Ecology and Evolution
- Language courses in the major world languages (English, French, Spanish, Chinese) please see Language centre: https://sprachenzentrum.uni-greifswald.de/en/

Basic module B1: Basics of Biodiversity, Ecology & Evolution 6

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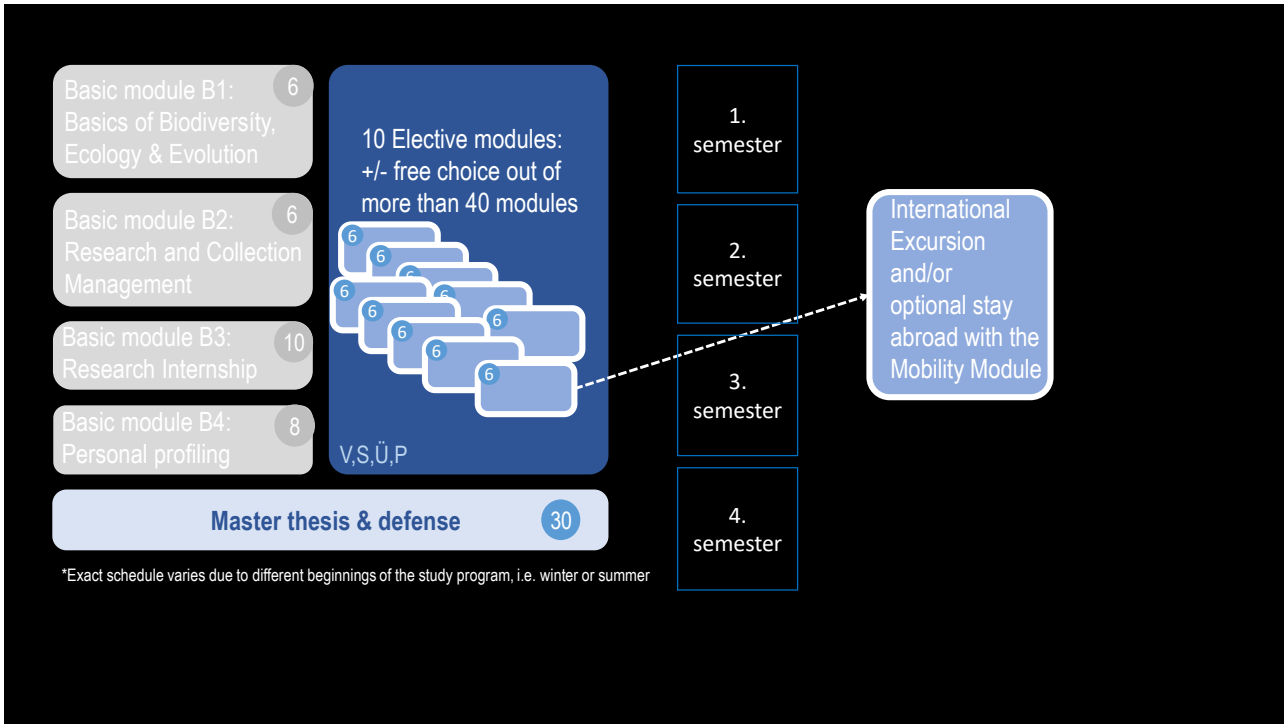
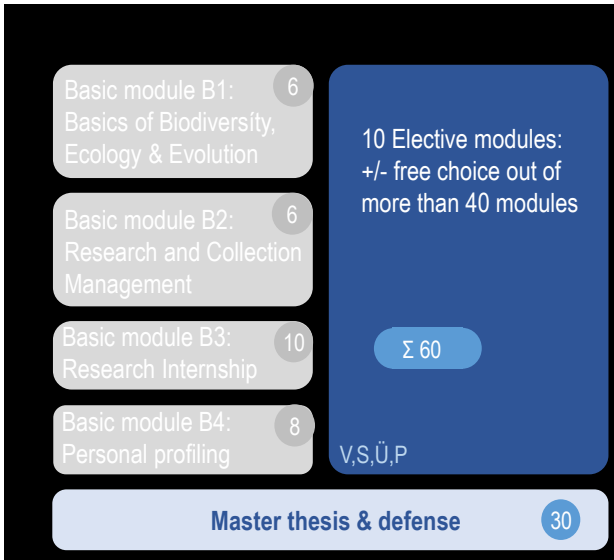
→ You have to hand in a protocol what you have been doing. The protocol can consist of some certificates you got in languages or other courses… If you know that you get everything together, register for the "exam" and let me know, send me your certificates (as scans, please in a word- or powerpoint-file.





Knowledge in the following fields is imparted:

- Ecological field and laboratory methods
- Recording and analysis of biodiversity
- Modelling, GIS analyses
- Behavioral analysis, telemetry
- Morphological analyses (histology, TEM, REM, µCT, CLSM)
- Phylogenetic analyses
- Population Genetics
- Environmental analytical methods (HPLC, GC, GC-MS)
- Microbiological analyses, immunology
- Quantitative and molecular genetics
- Protein biochemical analyses
- Database Management
- Statistical analyses

Elective Modules	Type	Sem
International Excursion	1 E	SoSe/ WiSe
Mobility Module		SoSe/ WiSe
Microbiomes and biodiversity 1: Lectures	3 V	WiSe
Microbiomes and biodiversity 2: Seminar and Lab Course	1 S, 1 P	SoSe
Botanical Species Conservation 1: Lecture and Seminar	1 V, 1 S	SoSe
Botanical Species Conservation 2: Lecture and Field Experiment	1 V, 1 P	SoSe
Conservation Genetics of Plants 1: Lecture and Seminar	1 V, 1 S	SoSe
Conservation Genetics of Plants 2: Lecture and Lab Course	1 V, 1 P	SoSe
Conservation and Behaviour 1: Lecture and Seminar	1 V, 1 of 2 S	SoSe
Conservation and Behaviour 2: Exercise	1 Ü	SoSe
Conservation Genetics 1: Lecture and Seminar	1 V, 1 of 2 S	WiSe
Conservation Genetics 2: Exercise	1 Ü	WiSe
Sustainability	2 S	SoSe

Aquatic and Marine Microbiology 1: Basics	2 V, 1 S, 1 Ü	WiSe
Aquatic and Marine Microbiology 2: Advanced	2 V, 1 S	SoSe
Aquatic and Marine Microbiology 3: Practical	1 P	SoSe
Microbial Ecology 1: Microbial Processes, Energy Fluxes and Elemental Cycles	1 V	WiSe
Microbial Ecology 2: Microbial biodiversity, interactions and molecular ecology	2 V	SoSe
Theoretical Ecology	1 V	WiSe
Experimental Animal Ecology	1 V/S, 1 Ü	WiSe
Functional Animal Ecology 1: Lecture and Seminar	1 V, 1 S	SoSe
Functional Animal Ecology 2: Exercises	1 Ü	SoSe
Experimental Plant Ecology	1 Ü, 1 S	WiSe
Evolutionary Ecology 1: Lecture and Exercise	1 V/S, 1 Ü	SoSe
Evolutionary Ecology2: Exercises	2 Ü	SoSe
Vegetation Ecology 1: Lecture and Seminar	1 V/Ü, 1 S	WiSe
Vegetation Ecology 2: Case Study	1 P	SoSe
Ornithology 1: Lecture and Seminar	1 V, 1 P	SoSe
Ornithology2: Exercise	1 Ü	SoSe

Climate Change	1 V, 1 S	SoSe
Dendrochronology	1 P	SoSe/ WiSe
General and Applied Aquatic Ecology	2 V, 1 S	WiSe
Aquatic Ecology – Summer course	1 P	SoSe
Remote Sensing	1 V/Ü	WiSe
Applied Remote Sensing/Geoinformation Science with field work	1 P	SoSe
Evolutionary Morphology	1 V, 1 S	WiSe
Making the invisible visible – Introduction to imaging methodes	1 V, 1 Ü	WiSe
Molecular Phylogenetics 1: Theory	1 V/Ü, 1 S	SoSe/ WiSe
Molecular Phylogenetics 2: Practice	2 Ü	SoSe
Animal Physiology 1: Lecture and Seminar	1 V, 1 S	SoSe
Animal Physiology 2: Lab Course	1 P	WiSe
Plant Stress Physiology: Lecture and Seminar	2 V, 1 S	WiSe
Experimental Plant Stress Physiology	1 P, 1 S	WiSe
Parasitology1: Lecture and Seminar	1 V, 1 S	SoSe
Parasitology2: Lab Course	1 P	SoSe

V: lecture, S: seminar, Ü: exercise, P: practical, E: excursion

Sum: 60 ETCS

Contact and Information: University of Greifswald - Biological Department

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martin.haase@uni-greifswald.de

Examination board: Prof. A. Wacker
Telephone +49 3834 420 4266
alexander.wacker@uni-greifswald.de

Note: for general module-organization, module-selection-procedure, etc.
we will use the following E-Mail address: msc.biodiv.eco.evo@uni-greifswald.de
So, please do not send your choices to my personal address!