Philipps Universität Marburg

Module Handbook

Faculty 19
Geography

As of February 2025

Physical Geography (M.Sc.)

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One credit point (ECTS) is based on 30 hours of work by an average student in the modules of this program.

1. Basics

1.1 Global Change

Module Title	**Global Change**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Basic module
Contents and Qualification Objectives	**Content** This module focuses on selected aspects of the human-environment relationship in the context of global change. Against the backdrop and justification of the current era known as the 'Anthropocene', important fields of action and spheres of human activity are identified, and their embedding in complex environmental systems with consequential effects and feedback mechanisms is described and evaluated. The focus is on: • Recognizing the mechanisms of human actions in the context of environmental systems at global, regional, and local levels, • Spatial and integrated modeling of cause-effect relationships and feedback mechanisms in the human-environment system, • Scenario-based, integrative analysis of the regional and local impacts of global change, • Development of sustainable courses of action. **Methods** Through alternating phases of self-study and critical reflection in plenary sessions, students deepen their knowledge from their respective disciplines in light of current studies from international journals. Specific topics related to global change, such as urbanization, resource use, population development, land use change, biodiversity, and climate change, are placed in a functional context in conjunction with political and social aspects. The results on these specific topics are to be illustrated, made tangible, and discussed in a collaborative project that emphasizes mutual networking. **Qualification Objective** Promotion of analytical and integrative skills as well as interconnected thinking at the interfaces between society and the environment. Development of the ability to recognize and model processes, mechanisms, and problems in human-environment relationships. Acquisition of the ability to address a defined topic in the context of background and in dependence on global processes in a problem-oriented manner, to assess it, and to translate it into a communication perspective. Furthermore, the work in small groups and plenary

	sessions conveys professional key skills such as presentation techniques, independent learning, time management, and teamwork.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Project seminar 2 contact hours
Workload	Lecture: attendance, preparations and follow-up (30 hours) Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (60 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework**: Literature review, data collection, data analysis, and presentation of results (15-30 minutes) or successful completion of 6-10 exercises or presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Winter semester

1.2 Data Analysis

Module Title	**Data Analysis**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Basic module
Contents and Qualification Objectives	**Content** The module provides methods for data preparation, description, and analysis using a scripting language, typically R. It is divided into: • An introduction to the scripting language as well as the fundamentals of version control, • An introduction to data analysis, • An introduction to modeling using statistical models and their validation, • An introduction to the visualization of datasets and information. **Methods** In alternating phases of collaborative exercises and solution-oriented self-study, students deepen their knowledge in the area of statistics and data analysis. The results of the self-study phases are directly secured through the application of documentation methods of the scripting language and are reflected upon mutually. **Qualification Objectives** Students acquire advanced analytical skills and competencies in data management and data analysis, as well as practical programming knowledge. Furthermore, the work in small groups and plenary sessions conveys professional skills such as presentation techniques, independent learning, time management, and teamwork.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 exercises *or* presentation (15-30 minutes) (each also possible as group work)

	Examination (= module examination): Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Winter semester

1.3 GIS and Remote Sensing for Advanced Users

Module Title	**GIS and Remote Sensing for Advanced Users**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Basic module
Contents and Qualification Objectives	This module paves the way for an advanced study of Geographic Information Systems (GIS) and remote sensing, highlighting the importance of acquiring associated methodological skills. A focus will be placed on operational analysis using GIS and remote sensing modules, which will be connected through simple scripting languages (e.g., Python). Only then can complex spatial analyses be implemented, and GIS and remote sensing datasets be fully utilized. Furthermore, a problem-based learning approach will enhance skills in project management, progress tracking, and presentation of results.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Project seminar 2 contact hours
Workload	Lecture: attendance, preparations and follow-up (30 hours) Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (60 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 exercises *or* presentation (15-30 minutes) (each also possible as group work) **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Winter semester

2. Core

2.1 Environmental Modeling

Module Title	**Environmental Modelling**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	**Content** In the course of this module, societal and environmental phenomena are modeled as systems, and their dynamics are examined. The focus is on the representation and abstraction of segments of the world and their depiction through a (graphical) modeling language. The scale-spanning analysis typically required for this is implemented through the selection of the model boundary and the differentiation of individual system components into explicitly considered variables and conditions. **Methods** Through alternating phases of collaborative exercises and inquiry-based group learning, students enhance their understanding of modeling geographic phenomena as dynamic systems. The tasks, typically presented in the form of modeling problems, are directly addressed through the construction of their own models and subsequent simulation analyses. **Qualification Objectives** Students acquire subject-specific and methodological skills in the area of modeling geographic subjects and can abstract these in the form of dynamic system models. They also enhance their understanding of the respective subjects through the process of modeling (learning with models). Furthermore, the collaborative work in small groups and plenary sessions conveys professional skills such as presentation techniques, independent learning, time management, and teamwork.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None

Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 exercises *or* presentation (15-30 minutes) (each also possible as group work) **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Summer semester

2.2 Biogeography

Module Title	**Biogeography**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	**Content** In this module, the spatial and temporal aspects of vegetation in the Central European cultural landscape are highlighted and examined through fieldwork. The emphasis is placed on the two major vegetation types in this region: forest and open land. In the context of the designated study area for this master's program, research approaches and methods are developed theoretically, specified for fieldwork, tested, and their ecosystem interactions with other physical geographical spheres addressed in the master's program are explored. The module is designed in conjunction with the central study area "Marburg University Forest Caldern", enabling the repeated investigations conducted each year to be incorporated into a monitoring program. **Methods** The initial focus is on the the study of literature, where students learn about the types of cultural landscapes and their history, as well as other ecological or ecophysiological backgrounds. In the common study area of all advanced modules, a selection of the existing vegetation types is examined. The focus is on individual species (plants and possibly also animals), plant communities, vegetation structures, population structures, functional traits, or conservation-relevant species groups. Methods and skills for data collection and analysis of species communities, vegetation structural properties, population parameters, and/or ecophysiological traits and processes include, for example, species identification, sociological vegetation mapping, ecophysiological measurement methods, dendroecological methods, gradient analyses, multivariate and univariate statistical methods, and for animal groups, the corresponding techniques of capture methods, optical and acoustic mapping, as well as movement modeling. Additionally, techniques for long-term monitoring are developed, and the own research results are placed in the temporal context of previous years. The simultaneously collected in situ data from other parallel modules (soil, hydrology, microclimate, etc.) allow for a cross-comparison and thus the development of ecosystem processes and mechanisms of action. The results of the investigations are summarized in the form of a report prepared in small groups.

	Qualification Objectives Upon completion of the module, students will be able to analyze a landscape section in terms of its natural features and spatial patterns, degree of naturalness, ecosystem services, temporal developments, and anthropogenic influences, and to assess it from a conservation perspective.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection, data analysis, and presentation of results (15-30 minutes) *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work) **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Summer semester

2.3 Geomorphology and Soil Geography

Module Title	**Geomorphology and Soil Geography**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	The module addresses the geomorphological and soil geographical components within a study area. In this context, geomorphological and soil geographical research approaches, questions, and methodological practices are discussed and developed independently. Students will learn to analyze and evaluate a specific aspect of physical geography in its ecosystemic interaction with various spheres, including human-environment relationships and the economic valuation of ecosystem services in space and time.
Teaching and Learning Methods, Types of Courses	Project seminar 1 contact hour Field work and exercise 2 contact hours
Workload	Project seminar: attendance, preparations and follow-up (30 hours) Field work and exercise (60 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work) **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Summer semester

2.4 Topoclimatology

Module Title	**Topoclimatology**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	Topoclimatology examines the small-scale modifications of the macroclimate through specific interactions between soil, vegetation, and the atmosphere. Relief and land use are of particular importance in this context. With the availability of new measurement methods and evaluation procedures, field climatological research has rapidly advanced in recent years. The module addresses the topoclimatological components in the shared study area of all advanced modules. In this context, topoclimatological research approaches, questions, and methodological practices are discussed and developed independently. The module focuses on the topoclimatological processes and influencing factors within the atmospheric boundary layer in the common study area of all advanced modules. Each climate element is examined in its specific interaction with the Earth's surface. A key part of the module includes modern measurement methods (e.g., ground-based remote sensing) and evaluation techniques (e.g., GIS, numerical modeling). In small-scale projects, the acquired knowledge is applied practically, including the conception and implementation of measurement campaigns as well as the analysis and further processing of collected and existing data. Within this context, topoclimatological research approaches, questions, and methodological practices are explored and developed independently. Students learn to analyze and evaluate a specific aspect of physical geography in its ecosystemic interaction with various spheres, including human-environment relationships and the economic valuation of ecosystem services in space and time.
Teaching and Learning Methods, Types of Courses	Project seminar 2 contact hour Field work and exercise 1 contact hour
Workload	Project seminar: attendance, preparations and follow-up (60 hours) Field work and exercise (30 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module

Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Summer semester

2.5 Hydrogeography

Module Title	**Hydrogeography**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	The module addresses the hydrogeographical components within a research area. In this context, hydrogeographical research approaches, questions, and methodological practices are discussed and developed independently. Students will acquire the skills to analyze and assess a particular aspect of physical geography in its ecological interaction with different spheres, including human-environment relationships and the economic assessment of ecosystem services over time and space.
Teaching and Learning Methods, Types of Courses	Advanced seminar 1 contact hour Field work and exercise 2 contact hours
Workload	Advanced seminar: attendance, preparations and follow-up (30 hours) Field work and exercise (60 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every second semester
Start of the Module	Summer semester

3. Specialization

3.1 Climate Impact Research I

Module Title	**Climate Impact Research I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	When addressing climate change, it is essential to first clarify the fundamental processes and relationships necessary for understanding the climate and its dynamics. This begins with the concept of the climate system itself. The climate system is a highly complex system composed of various subsystems (atmosphere, hydrosphere, cryosphere, land surface, biosphere) that interact with one another. It changes under the influence of its own internal dynamics and external drivers, not least due to anthropogenic influences such as greenhouse gas emissions and changes in land use. Modifications in one part of the system can trigger unpredictable reactions in other parts, thereby altering the entire system. The module focuses on the climate system using selected components and the processes and interactions occurring within it as examples. Complex issues within the climate system, along with their functions and behaviors, are analyzed and modeled. This approach fosters a better understanding of the interrelationships within the climate system and provides access to the complex problems of climate change. The collection and evaluation of spatial data, interpretation of results, and derivation of scientific statements play a crucial role in this context. Through concrete problem-solving tasks, students learn to design and implement projects, thereby acquiring problem-solving skills relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 1 contact hour Exercise 2 contact hours
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Exercise: attendance, preparations and follow-up (60 hours) Exam preparation and exam (60 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module

Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Winter semester

3.2 Climate Impact Research II

Module Title	**Climate Impact Research II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The change in climate is evident both in the gradually rising temperatures and in the more frequent occurrence of extreme weather events such as storms, droughts, and heatwaves. The consequences of climate change are thus diverse and will increasingly manifest in the future in countries such as Germany or England. Examples include health impacts on humans, animals, and plants due to, for example, heat. The module addresses climate change and its effects on weather events and natural ecosystems. In this context, the collection and evaluation of spatial data, the interpretation of results, and the derivation of scientific statements play an important role. Available datasets will be analyzed concerning climate change as a global phenomenon and its regional impacts, considering both established and modern measurement and analysis methods. Furthermore, central aspects include the identification and assessment of the impacts of climate change and associated risks. Based on this, action options and adaptation strategies will be analyzed and evaluated. Through concrete problem-solving tasks, students learn to design and implement projects, thereby acquiring problem-solving skills relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 1 contact hour Exercise 2 contact hours
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Exercise: attendance, preparations and follow-up (60 hours) Exam preparation and exam (60 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	Recommendation: Completion of the module “Climate Impact Research I”
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):**

	Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Summer semester

3.3 Environmental Informatics I

Module Title	**Environmental Informatics I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	**Content** In the context of the module, students will further develop their knowledge in the field of remote sensing and geographic data modeling. Based on specific problem statements, such as the creation, homogenization, and analysis of long satellite data time series or the spatial prediction of population patterns based on observations at individual sites, methods for spatiotemporal analysis of environmental phenomena will be the focus. **Methods** In one or two project-oriented phases, students will work in groups to address the problems presented to them, deepening their knowledge in the field of spatiotemporal modeling and analysis. The results of the project phases will be discussed and reflected upon comparatively. **Qualification Objectives** Students will acquire subject-specific and methodological skills in the area of spatiotemporal prediction and analysis of environmental information. They will be able to apply and assess appropriate modeling and evaluation methods proficiently. Furthermore, the work in small groups and plenary sessions conveys professional key skills such as presentation techniques, independent learning, time management, and teamwork.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work).

	Examination (= module examination): Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Summer semester

3.4 Environmental Informatics II

Module Title	**Environmental Informatics II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	**Content** In the context of the module, knowledge in the field of remote sensing, particularly in UAV remote sensing, will be deepened. Based on specific problem statements, such as forest structure analysis or the prediction of biodiversity patterns, research designs and flight plans will be developed. The necessary in-situ and UAV data will be collected and processed, and models will be created to enable predictions of the respective target variable based on the remote sensing data. Typically, the fieldwork for this module takes place in the university forest of Caldern. **Methods** In alternating phases of collaborative learning and group-oriented projects, students will tackle the assigned problem and deepen their subject-specific and methodological knowledge in the field of UAV remote sensing. The project phases ensure that the entire workflow is represented, from research design and flight planning to the actual flight and semi-operational evaluation of the datasets. **Qualification Objectives** Students have developed subject-specific and methodological skills in the field of UAV-based environmental and biodiversity remote sensing. They can align flight plans with problem statements and research designs, conduct their own flights, and evaluate the collected data in a question-oriented and semi-operational manner using their own software scripts and third-party applications. Furthermore, the collaborative work in small groups and plenary sessions imparts professional skills such as presentation techniques, independent learning, time management, and teamwork.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	Recommendation: Completion of the module “Environmental Informatics I”

Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Winter semester

3.5 Environmental Hydrology I

Module Title	**Environmental Hydrology I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of environmental hydrology. Individual aspects include, among others, soil hydrology, process-oriented catchment modeling, water management, and water quality. Based on a concrete problem statement from hydrogeography and ecohydrology, students learn to design and implement projects. The collection and evaluation of spatial data, the interpretation of results, and the derivation of scientific statements play a central role in this process. Students acquire problem-solving skills relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 2 contact hours Project seminar 1 contact hour
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Project seminar: attendance, preparations and follow-up (30 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Winter semester

3.6 Environmental Hydrology II

Module Title	**Environmental Hydrology II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of environmental hydrology. Individual aspects include, among others, soil hydrology, process-oriented catchment modeling, water management, and water quality. Based on a concrete problem statement from hydrogeography and ecohydrology, students learn to design and implement projects. The collection and evaluation of spatial data, the interpretation of results, and the derivation of scientific statements play a central role in this process. Students acquire problem-solving skills relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 2 contact hours Project seminar 1 contact hour
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Project seminar: attendance, preparations and follow-up (30 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	Recommendation: Completion of the module “Environmental Hydrology I”
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Summer semester

3.7 Applied Soil Science I

Module Title	**Applied Soil Science I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of applied soil science. Individual aspects include, among others, soil physics, soil water management, soil protection, 1D modeling systems, and site assessment. Based on a concrete problem statement, students learn to design and implement projects. The collection and evaluation of spatial data, the interpretation of results, and the derivation of scientific statements play a central role in this process. Students acquire problem-solving competencies relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 2 contact hours Project seminar 1 contact hour
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Project seminar: attendance, preparations and follow-up (30 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Summer semester

3.8 Applied Soil Science II

Module Title	**Applied Soil Science II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of applied soil science. Individual aspects include, among others, soil physics, soil water management, soil protection, 1D modeling systems, and site assessment. Based on a concrete problem statement from soil geography and applied soil science, students learn to design and implement projects. The collection and evaluation of spatial data, the interpretation of results, and the derivation of scientific statements play a central role in this process. Students acquire problem-solving competencies relevant to their future employment.
Teaching and Learning Methods, Types of Courses	Advanced seminar 2 contact hours Project seminar 1 contact hour
Workload	Advanced seminar: attendance, preparations and follow-up (60 hours) Project seminar: attendance, preparations and follow-up (30 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	Recommendation: Completion of the module “Applied Soil Science I”
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Winter semester

3.9 Biodiversity Research I

Module Title	**Biodiversity Research I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of biodiversity research. Spatial distribution patterns of vegetation are explored at various scales, ranging from regional to landscape levels and down to local vegetation patterns and interactions among plants. Specific aspects include, for example, plant functional types, organismal distribution patterns, and ecological properties or ecosystem services. Based on a concrete problem statement, students learn to design and implement biogeographical research projects. The planning of the project, the collection and evaluation of spatially relevant vegetation data, the interpretation of results, and the derivation of scientific statements play a central role in this process.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Winter semester

3.10 Biodiversity Research II

Module Title	**Biodiversity Research II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills in the field of biodiversity research. The focus is on research related to ecosystem functions and/or the ecological and ecophysiological functions of plants and vegetation. Students will learn to independently develop and address a scientific question either by designing and conducting an ecological research project or through an in-depth literature review. Central to this process are the planning of the project, the collection and evaluation of data or literature information, the interpretation of results, the derivation of scientific statements, and the presentation of the project in oral and/or written form
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Project seminar: attendance, preparations and follow-up (90 hours) Exam preparation and exam (90 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	Recommendation: Completion of the module “Biodiversity Research I”
Applicability of the Module	M.Sc. Physical Geography, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 practice tasks *or* presentation (15-30 minutes) (each also possible as group work). **Examination (= module examination):** Integrated project work *or* portfolio *or* written assignment *or* presentation (each also possible as group work)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every fourth semester
Start of the Module	Summer semester

4. Practice

4.1 Professional Internship

Module Title	**Professional Internship**
Credit Points	12 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Practical module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential professional environment, gain additional field-related and key qualifications, achieve assessment criteria for the goal-oriented and professional qualification of their further studies, and establish networks with potential employers.
Teaching and Learning Methods, Types of Courses	Professional Internship
Workload	Professional Internship (Professional Internship (330 hours/typically 8 weeks, 12 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approx. 5 pages) according to Appendix 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

4.2 Research Internship

Module Title	**Research Internship**
Credit Points	12 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Practical module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential scientific career field, gain additional field-related and key qualifications, meet assessment criteria for the goal-oriented and professional qualification of their further studies, and establish networks with potential research groups.
Teaching and Learning Methods, Types of Courses	Research Internship 4 contact hours
Workload	Research Internship (330 hours/typically 8 weeks, 12 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approximately 5 pages) according to Annex 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

5. Profile Modules

5.1 Extended Professional Internship I

Module Title	**Extended Professional Internship I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Profile module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential professional field, gain additional field-related and key qualifications, meet assessment criteria for the goal-oriented and professional qualification of their further studies, and establish contacts with potential employers.
Teaching and Learning Methods, Types of Courses	Professional Internship
Workload	Professional Internship (150 hours/typically 4 weeks, 6 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approximately 5 pages) according to Annex 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

5.2 Extended Research Internship I

Module Title	**Extended Research Internship I**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Profile module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential scientific career field, gain additional field-related and key qualifications, meet assessment criteria for the goal-oriented and professional qualification of their further studies, and establish contacts with potential research groups.
Teaching and Learning Methods, Types of Courses	Research Internship 2 contact hours
Workload	Research Internship (150 hours/ typically 4 weeks, 6 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approximately 5 pages) according to Annex 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

5.3 Extended Professional Internship II

Module Title	**Extended Professional Internship II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Profile module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential professional field, gain additional field-related and key qualifications, meet assessment criteria for the goal-oriented and professional qualification of their further studies, and establish contacts with potential employers.
Teaching and Learning Methods, Types of Courses	Professional Internship
Workload	Professional Internship (150 hours/typically 4 weeks, 6 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approximately 5 pages) according to Annex 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

5.4 Extended Research Internship II

Module Title	**Extended Research Internship II**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Profile module
Contents and Qualification Objectives	Students apply their acquired subject-specific and methodological knowledge in a potential scientific career field, gain additional field-related and key qualifications, meet assessment criteria for the goal-oriented and professional qualification of their further studies, and establish contacts with potential research groups.
Teaching and Learning Methods, Types of Courses	Research Internship 2 contact hours
Workload	Research Internship (150 hours/typically 4 weeks, 6 credits (ECTS)) Exam preparation and exam (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approximately 5 pages) according to Annex 5 § 7
Grades	The module is ungraded in accordance with § 28 General Provisions.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

6. Final Modules

6.1 Final Module Climate Impact Research

Module Title	**Final Module Climate Impact Research**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a specific topic in Physical Geography with an emphasis on "climate impact research" within a given timeframe using scientific methods. Students will learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis and colloquium
Workload	Preparation of the master's thesis (870 hours), preparation for the colloquium (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module component examination):** Master's thesis (29 credits (ECTS)) and colloquium (1 credit (ECTS), 30-60 minutes)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

6.2 Final Module Environmental Informatics

Module Title	**Final Module Environmental Informatics**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a specific topic in Physical Geography, with an emphasis on "Environmental Informatics," within a given timeframe using scientific methods. Students will learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis and colloquium
Workload	Preparation of the master's thesis (870 hours), preparation for the colloquium (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module component examination):** Master's thesis (29 credits (ECTS)) and colloquium (1 credit (ECTS), 30-60 minutes)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

6.3 Final Module Environmental Hydrology

Module Title	**Final Module Environmental Hydrology**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a specific topic in Physical Geography, with an emphasis on "Environmental Hydrology," within a given timeframe using scientific methods. Students will learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis and colloquium
Workload	Preparation of the master's thesis (870 hours), preparation for the colloquium (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module component examination):** Master's thesis (29 credits (ECTS)) and colloquium (1 credit (ECTS), 30-60 minutes)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

6.4 Final Module Applied Soil Science

Module Title	**Final Module Applied Soil Science**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a specific topic in Physical Geography, with an emphasis on "Applied Soil Sciences," within a given timeframe using scientific methods. Students will learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis and colloquium
Workload	Preparation of the master's thesis (870 hours), preparation for the colloquium (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module component examination):** Master's thesis (29 credits (ECTS)) and colloquium (1 credit (ECTS), 30-60 minutes)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester

6.5 Final Module Biodiversity Research

Module Title	**Final Module Biodiversity Research**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a specific topic in Physical Geography, with an emphasis on "Biodiversity Research," within a given timeframe using scientific methods. Students will learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis and colloquium
Workload	Preparation of the master's thesis (870 hours), preparation for the colloquium (30 hours)
Teaching and Examination Language	German or English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Physical Geography
Prerequisites for the Awarding of Credit Points	**Examination (= module component examination):** Master's thesis (29 credits (ECTS)) and colloquium (1 credit (ECTS), 30-60 minutes)
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One Semester
Frequency of the Module	Every semester
Start of the Module	Summer and winter semester