Philipps Universität Marburg

Module Handbook

Faculties 19 & 02
Geography & Economics

As of December 2024

Sustainable Development (M.Sc.)

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1. Background

Module Title	**Introduction to Geography**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Basic module
Contents and Qualification Objectives	Students acquire basic knowledge and understand the interdependence and change of human-environment relationships. They learn the scientific foundations of research perspectives and approaches from two pillars: Human Geography and Physical Geography. They systematically engage with subject-specific questions and theoretical concepts in various subfields of Human Geography (e.g., population geography, economic geography, innovation geography, peripheral and urban areas) and Physical Geography (e.g., biogeography, climate geography, soil and hydrogeography) and can apply these to issues of sustainable development. Students are able to present the current state of scientific knowledge and current discussions, as well as identify fundamental relationships, specific methods, and important technical terms. They analyze and evaluate different methods for understanding complex relationships based on a specific example. Students enhance their social and communication skills through group work, discussions, and presentations.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** 2-6 presentations *or* 6-10 exercise tasks *or* project work (also possible as group work) **Examination (= module examination):** Portfolio *or* presentation *or* project work (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 winter semester
Start of the Module	In the first week of the winter semester
Person(s) responsible for the module	Thomas Brenner

2. Core

Module Title	**Sustainable Development Economics**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Advanced module
Contents and Qualification Objectives	After participating in the modules, students will be able to understand the expected impacts of climate change on various social dimensions and to evaluate and further develop interventions aimed at addressing poverty, inequality, and energy issues, as well as enhancing health, education, and gender equality. Students will acquire the methodological skills for impact evaluation in order to analyze interventions and apply them independently in their own projects.
Teaching and Learning Methods, Types of Courses	Lecture 2 contact hours Exercise 2 contact hours
Workload	**Option A:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 56 hours Exam preparation: 68 hours **Option B:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 45 hours Time for coursework: 34 hours Exam preparation: 45 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Option A:** **Examination (= module examination):** Term paper *or* presentation (also possible as group work) *or* written exam **Option B:** **Coursework:** 6-8 worksheets *or* presentation (10-30 minutes) *or* term paper (2.800-3.500 words) *or* test (30-60 minutes)

	Examination (= module examination): Term paper *or* presentation (each also possible as group work) *or* written exam
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Every winter semester
Start of the Module	In the first week of the winter semester
Person(s) responsible for the module	Björn Vollan
References	De Janvry, A. & E. Sadoulet (2016): Development Economics Theory and Practice. Routledge: London, New York.

Module Title	**Globalization and Sustainable Transformation**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Advanced module
Contents and Qualification Objectives	The aim of the module is to convey the human geographical perspective on the spatiotemporal changes in human-environment relationships, emphasizing their relationality, context specificity, and multiscalarity. Through participation in the modules, students are able to demonstrate the way in which challenges of sustainable development are shaped by the influence of processes at different scales that are in close interrelationship. Students will be capable of independently analyzing, explaining, and assessing research questions and problems related to sustainable development, guided by theoretical frameworks, and evaluating their spatial impacts. To achieve this, they will acquire skills in problem analysis, the application of theoretical and methodological approaches, and their critical reflection. Students will also develop social and communication competencies through group work, presentations, and discussions. Intercultural understanding will be fostered through the development of internationally comparative case studies.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Seminar 3 contact hours
Workload	Contact hours: 56 hours Preparations and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Successful completion of 4-8 thesis papers including discussion *or* successful completion of 6-10 exercise tasks *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 winter semester
Start of the Module	In the first week of the winter semester
Person(s) responsible for the module	Simone Strambach, Sören Becker

Module Title	**Global Change / Planetary Boundaries**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Advanced module
Contents and Qualification Objectives	Students acquire not only fundamental factual knowledge about human-environment relationships but also a deep conceptual and methodological understanding for the application of geographical regional analyses in complex spatial impact contexts, using concrete examples. In the regional analyses, they develop the ability to analyze and identify critical system states and tipping points, as well as to derive critical thresholds that are triggered by anthropogenically induced global change that may occur in the future, impacting the societal system. Students gain the ability to work on a defined topic using fundamental regional and subject analysis in a problem-oriented manner and to critically assess it. In addition to the ability to reflect critically, students will be able, upon successful completion of the module, to independently conduct, present, and evaluate problem-oriented regional analyses.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Exercise 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Successful completion of 6-10 exercise tasks *or* presentation (each also possible as group work) **Examination (= module examination):** Project work or portfolio *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 winter semester
Start of the Module	In the first week of the winter semester

Person(s) responsible for the module	Jörg Bendix

3. Specialization: Economics

Module Title	**Challenges to Sustainable Development**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	After participating in the modules, students will be able to outline the specific challenges faced by low-income countries and exporters of fossil fuels, as well as the socially and economically conditioned conflicts of interest that can obstruct the implementation of sustainable development. Students will acquire a conceptual and methodological understanding of the trade-offs in sustainable development goals and the normative aspects of sustainability research; they will discuss the role of uncertainties and political-economic processes.
Teaching and Learning Methods, Types of Courses	Lecture 2 contact hours Exercise 2 contact hours
Workload	**Option A:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 56 hours Exam preparation: 68 hours **Option B:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 45 hours Time for coursework: 34 hours Exam Preparation: 45 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Option A:** **Examination (= module examination):** Term paper *or* presentation (each also possible as group work) *or* written exam **Option B:** **Coursework:**

	6-8 worksheets *or* presentation (10-30 minutes) *or* term paper (2.800-3.500 words) *or* test (30-60 minutes) **Examination (= module examination):** Term paper *or* presentation (each also possible as group work) *or* written exam
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the first week of the respective semester
Person(s) responsible for the module	Claudia Schwirplies, Björn Vollan

Module Title	**Pathways to Sustainable Transformation**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	After participating in the modules, students will be able to analyze and evaluate empirical findings on individual behavioral changes and societal transformations, connect these insights with knowledge from economics, psychology, sociology, and related disciplines, and discuss economic policy measures and political-institutional reforms.
Teaching and Learning Methods, Types of Courses	Lecture 2 contact hours Exercise 2 contact hours
Workload	**Option A:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 56 hours Exam preparation: 68 hours **Option B:** Contact hours: 56 hours (may partially take place in the form of blended learning) Preparation and follow-up: 45 hours Time for Coursework: 34 hours Exam preparation: 45 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Option A:** **Examination (= module examination):** Term paper *or* presentation (each also possible as group work) *or* written exam **Option B:** **Coursework:** 6-8 worksheets *or* presentation (10-30 minutes) *or* term paper (2.800-3.500 words) *or* test (30-60 minutes) **Examination (= module examination):** Term paper *or* presentation (each also possible as group work) *or* written exam

Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the first week of the respective semester
Person(s) responsible for the module	Björn Vollan

4. Specialization: Human Geography

Module Title	**Geographies of Sustainable Transformation**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	Students acquire a conceptual and methodological understanding for the application of subject-specific concepts in the spatial examination of sustainable development and socio-ecological transformation processes, as well as the resulting conflicts. They are capable of designing and implementing projects addressing specific issues. In this context, they can collect and analyze spatially related data, interpret the results obtained, and derive scientific and/or political statements from them. Students develop problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Successful completion of 6-10 exercise tasks *or* successful completion of 4-8 thesis papers including discussion *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 winter semester
Start of the Module	In the first week of the winter semester
Person(s) responsible for the module	Simone Strambach, Markus Hassler, Thomas Brenner, Sören Becker

Module Title	**Innovation and Knowledge for Sustainable Development**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	Students acquire a conceptual and methodological understanding of new forms of innovation (social and sustainability innovation) that are particularly relevant for sustainable transformation at regional, national, and global levels. They gain subject-specific competencies in the spatial examination of sustainability-oriented innovation processes. They are able to identify and act according to the principles of knowledge co-production in sustainability research. Students can analyze and evaluate complex knowledge dynamics, including their multi-actor constellations and multiscalarity. Through a concrete problem statement, they learn to design and implement projects. In this context, the collection and evaluation of spatially related quantitative and qualitative data, the interpretation of results, and the derivation of scientific and/or political statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Successful completion of 6-10 exercise tasks *or* successful completion of 4-8 thesis papers including discussion *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 summer semester
Start of the Module	In the first week of the summer semester
Person(s) responsible for the module	Simone Strambach, Markus Hassler, Thomas Brenner

Module Title	**Economic Growth and Sustainability**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	Students acquire a conceptual and methodological understanding for the application of subject-specific concepts in the area of regional and national growth processes. Through a concrete problem definition, the students acquire the skills for planning and executing projects. In this context, the collection and evaluation of spatially related data, the interpretation of results, and the derivation of scientific and/or political statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Successful completion of 6-10 exercise tasks *or* successful completion of 4-8 thesis papers including discussion *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 winter semester
Start of the Module	In the first week of the winter semester
Person(s) responsible for the module	Simone Strambach, Markus Hassler, Thomas Brenner

Module Title	**Space and Policy**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	Students acquire a conceptual and methodological understanding for the application of subject-specific concepts in the field of sustainable spatial development policy/economic spatial policy. Based on a concrete problem statement, the students acquire the skills for planning and executing projects. In this context, the substantive design of spatial development policy-related/spatial economic policy-related, planning measures and instruments, the collection and evaluation of spatially relevant data, the interpretation of the results, and the derivation of scientific and/or spatial development policy-related/spatial economic policy-related/spatial planning statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Successful completion of 6-10 exercise tasks *or* successful completion of 4-8 thesis papers including discussion *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 summer semester
Start of the Module	In the first week of the summer semester

Person(s) responsible for the module	Simone Strambach, Markus Hassler, Thomas Brenner, Sören Becker, Ansgar Dorenkamp

5. Specialization: Physical Geography

Module Title	**Climate Change**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills from the focus area of climate change and impact research. Individual aspects include the climate system, climate change, and the impacts of climate change on the ecological and socio-economic subsystems of the climate system. Based on a concrete problem statement, the students acquire the skills for planning and executing projects. In this context, the collection and evaluation of spatially related data (particularly climate-relevant time series and future model projections), the interpretation of results, and the derivation of scientific statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 exercise tasks *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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	Each semester
Start of the Module	In the first week of the respective semester
Person(s) responsible for the module	Boris Thies

Module Title	**Life on Land**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills from the focus area of biodiversity research. Individual aspects include, for example, plant-environment relationships, organism distribution patterns, ecological processes, and ecosystem services. Based on a concrete problem statement, the students acquire the skills for planning and executing projects. In this context, the collection and evaluation of spatially related data, the interpretation of results, and the derivation of scientific statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Data collection *or* successful completion of 6-10 exercise tasks *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 summer semester
Start of the Module	In the first week of the summer semester
Person(s) responsible for the module	Maaike Bader

Module Title	**Soil and Water Resources**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Specialization module
Contents and Qualification Objectives	The module deepens specific knowledge and skills from the focus area of environmental hydrology or applied soil sciences. Individual aspects include, among others, soil hydrology, process-oriented water catchment area modeling, water management, and water quality. Based on a concrete problem statement, the students acquire the skills for planning and executing projects. In this context, the collection and evaluation of spatially related data, the interpretation of results, and the derivation of scientific statements play a central role. Students acquire problem-solving competencies relevant to their professional field.
Teaching and Learning Methods, Types of Courses	Project seminar 3 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Compulsory attendance** **Coursework:** Data collection *or* successful completion of 6-10 exercise tasks *or* presentation (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 summer semester
Start of the Module	In the first week of the summer semester
Person(s) responsible for the module	Peter Chifflard

6. Methods and Analytics

Module Title	**Advanced Statistical Methods**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	The aim of the module is to teach more complex statistical methods, especially multiple and non-linear regressions, handling spatial data, time series, and panel analyses. Students will be able to independently select and conduct complex statistical procedures and interpret the results. Through their own project, they will gain practical experience with statistical analyses.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Exercise 2 contact hours
Workload	Contact hours: 42 hours Preparation and follow-up: 70 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Successful completion of a project including presentation (15-60 minutes) *and* written documentation (1.100- 1.800 words) (each also possible as group work) **Examination (= module examination):** Written exam
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Every summer semester
Start of the Module	In the first weeks of the summer semester
Person(s) responsible for the module	Thomas Brenner

Module Title	**Advanced Empirical Social Research Methods**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	In the context of this module, students will develop an advanced methodological and theoretical understanding of empirical social and economic research. In addition to important theoretical and conceptual foundations, they acquire a deeper understanding of various methods. They will discuss the triangulation of methods in relation to the complex questions of sustainable development and apply these methods. Upon successful completion of the module, students will be able to formulate theory-driven scientific empirical questions, develop an empirical research design for analysis, interpret the results, and present their findings.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Exercise 2 contact hours
Workload	Contact hours: 42 hours Preparation and follow-up: 70 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Successful completion of 3-5 exercise tasks *and* presentation (15-60 minutes) (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *or* presentation (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 winter semester, irregularly in the summer semester
Start of the Module	In the first week of the respective semester
Person(s) responsible for the module	Ansgar Dorenkamp

Module Title	**Environmental Modelling**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	As part of this module, students focus extensively on Geographic Information Systems and spatial modeling (process models and/or machine learning methods) and acquire related methodological competencies. One focus is on operational analysis with the help of GIS modules, which will be connected through simple scripting languages (particularly R and Python). They will be able to use these systems to analyze and model data. Through a problem-based learning approach, they will also gain skills in project management, progress monitoring, and the presentation of results.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Exercise 2 contact hours
Workload	Contact hours: 42 hours Preparation and follow-up: 70 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Data collection *or* successful completion of 6-10 exercise tasks *or* presentation (15-60 minutes) (each also possible as group work) **Examination (= module examination):** Project work *or* portfolio *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 summer semester
Start of the Module	In the first week of the summer semester
Person(s) responsible for the module	Dirk Zeuss

Module Title	**Remote Sensing**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Advanced module
Contents and Qualification Objectives	As part of the module, students will train in various remote sensing methods based on concrete questions and acquire the associated skills in geodata processing and analysis. The module is divided into four areas: In the first part, the fundamentals of remote sensing are covered, considering both optical passive (multi/hyperspectral remote sensing) and active (LiDAR) data sources. The second part focuses on vegetation indices and time series analyses. In the third part, the course emphasizes land use classifications, before concluding in the fourth part with the prediction of atmospheric and biodiversity parameters using machine learning methods. Throughout the module, students will develop both specialized competencies in remote sensing and methodological competencies in automated geodata processing and analysis (primarily using R and Python) as well as Geographic Information Systems (mainly using QGIS). Practical problem-solving skills will be cultivated in the context of exercise tasks.
Teaching and Learning Methods, Types of Courses	Lecture 1 contact hour Exercise 2 contact hours
Workload	Contact hours: 42 hours Preparation and follow-up: 70 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development, export module
Prerequisites for the Awarding of Credit Points	**Coursework:** Fieldwork including data collection *or* successful completion of 6-10 exercise tasks *or* presentation (15-60 minutes) (each also possible as group work) **Examination (= module examination):** Project work or portfolio 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 summer semester
Start of the Module	In the first week of the summer semester
Person(s) responsible for the module	Jörg Bendix

7. Electives

Module Title	**Internship Small**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Practical module
Contents and Qualification Objectives	Students are able to apply the acquired subject-specific and methodological knowledge in a potential professional field, gain additional field-related qualifications and key competencies, establish assessment criteria for the goal-oriented and professional qualification of their further studies, and network with potential employers.
Teaching and Learning Methods, Types of Courses	Professional internship
Workload	Professional internship: 150 hours (typically 4 weeks) Exam preparation/exam: 30 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approx. 5 pages) according to Appendix 5 § 5
Grades	The module is ungraded in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the summer and winter semester
Person(s) responsible for the module	

Module Title	**Internship Medium**
Credit Points	12 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Practical module
Contents and Qualification Objectives	Students are able to apply the acquired subject-specific and methodological knowledge in a potential professional field, gain additional field-related qualifications and key competencies, establish assessment criteria for the goal-oriented and professional qualification of their further studies, and network with potential employers.
Teaching and Learning Methods, Types of Courses	Professional internship
Workload	Professional internship: 330 hours (typically 8 weeks) Exam preparation/exam: 30 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approx. 5 pages) according to Appendix 5 § 5
Grades	The module is ungraded in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the summer and winter semester
Person(s) responsible for the module	

Module Title	**Research Internship**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Practical module
Contents and Qualification Objectives	The students are able to apply the acquired subject-specific and methodological knowledge in a potential scientific career field, acquire additional field-related qualifications and key competencies, establish assessment criteria for the goal-oriented and professional qualification of their further studies, network with potential research groups, and, if applicable, collect or test data and methods for their master's thesis.
Teaching and Learning Methods, Types of Courses	Professional internship
Workload	Research internship: 150 hours (typically 4 weeks) Exam preparation/exam: 30 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Internship report (approx. 5 pages) according to Appendix 5 § 5
Grades	The module is ungraded in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the summer and winter semester
Person(s) responsible for the module	

Module Title	**Key Qualifications**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory elective
Level	Profile module
Contents and Qualification Objectives	Students acquire interdisciplinary or career-oriented competencies. The key qualifications promote effective learning while simultaneously providing a solid foundation for lifelong professional development. Furthermore, graduates are equipped to respond flexibly to various professional requirements throughout their careers and to handle them appropriately.
Teaching and Learning Methods, Types of Courses	Seminar 2 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Portfolio
Grades	The module is ungraded in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the summer and winter semester
Person(s) responsible for the module	

8. Interdisciplinary

Module Title	**Interdisciplinary Colloquium**
Credit Points	6 credits (ECTS)
Degree of Obligation	Compulsory
Level	Specialization module
Contents and Qualification Objectives	After participating in the module, students are able to develop a critical, interdisciplinary engagement with theoretical models and methodological approaches in the relevant fields. Students enhance their presentation and argumentation skills within an interdisciplinary group. They reflect on the normative implications of their research based on environmental ethics, theories of justice, or future ethics.
Teaching and Learning Methods, Types of Courses	Seminar 2 contact hours
Workload	Contact hours: 56 hours Preparation and follow-up: 56 hours Exam preparation: 68 hours
Teaching and Examination Language	English
Prerequisites for Participation	None
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Coursework:** Discussion of a Presentation **Examination (= module examination):** Presentation
Grades	The module is ungraded in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the first week of the respective semester
Person(s) responsible for the module	Sören Becker, Björn Vollan

9. Master Thesis

Module Title	**Master Thesis**
Credit Points	30 credits (ECTS)
Degree of Obligation	Compulsory
Level	Final module
Contents and Qualification Objectives	The focus is on acquiring the ability to independently address a defined topic in the field of sustainable development within a specified timeframe using scientific methods. Students learn to analyze and argue independently.
Teaching and Learning Methods, Types of Courses	Master's thesis
Workload	Preparation of the master's thesis: 900 hours
Teaching and Examination Language	English
Prerequisites for Participation	Successful completion of modules in the M.Sc. Sustainable Development amounting to at least 60 ECTS credits
Applicability of the Module	M.Sc. Sustainable Development
Prerequisites for the Awarding of Credit Points	**Examination (= module examination):** Master's thesis
Grades	The grading is conducted in accordance with § 28 General Regulations.
Duration of the Module	One semester
Frequency of the Module	Each semester
Start of the Module	In the summer and winter semester
Person(s) responsible for the module	