Fakultät für Umwelt und natürliche Ressourcen
Faculty of Environment and Natural Ressources

Module handbook / Modulhandbuch

Electives / Wahlpflichtfächer

Master of Science (M.Sc.)
Forstwissenschaften / Forest Sciences
Umweltwissenschaften / Environmental Sciences

Summer semester 2025

(Examination regulations version 2023)

universität freiburg

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Electives

This handbook describes all the electives of the two study programs MSc Environmental Sciences and MSc Forest Sciences **for the summer semester 2025**. Electives vary in subject, language, duration, type of teaching and frequency. The modules described here may or may not be offered in subsequent semesters. For each semester there will be a list published that encompasses all electives being offered. It will be provided via the mailing lists by the program coordinator as well as on the program websites.
For participating in an elective, students must enroll via the online platform HisInOne within the booking periods that are shown at each module. Participation can be guaranteed only up to a max. number of students for each module.

Language

The electives are offered either in German or English. The language used to describe the individual modules is the language of instruction.

Structure of the modules within the study program

1) Core modules:
Three core modules (15 ECTS) are compulsory for all students. They are offered in the first and third semesters.

2) Major modules:
Major modules are mandatory for the major chosen. In total, 10 major modules accounting for 50 ECTS need to be taken, usually in the first, second and third semester.

3) Electives:
Three electives totaling 15 ECTS must be taken during the program. Students can choose from a variable offer of modules for the two Master's programs MSc Forest Sciences and MSc Environmental Sciences. It is also possible to choose modules from other Master's degree programs of the faculty, the university or outside the university, as long as there is a subject-related connection. The examination board decides on suitability in accordance with the respective major. Language courses are not considered as suitable courses.

Electives offered during the summer semester 2025

In the summer semester the modules are taught in a three-week-block after the lecture period at the end of the semester.

Number	Name	Language
64125	**Marine Ecology**	ENG
64086	**Analyse forstlicher Arbeitssysteme**	DE
64111	**Plants Make Scents**	ENG
13012	**Gräser und Grasartige – Bestimmen und Erkennen**	DE

13015	**Forest Genetics Research Lab**	ENG
13018	**Diagnostic Methods for Tree Diseases**	ENG
13026	**Agroforstsysteme**	DE
13030	**Historical timber trade**	ENG
13031	**Human-wildlife interactions in mountain landscapes**	ENG
13032	**Inventory and Evaluation in Nature Conservation**	ENG
91813/ 93936	**Global Sustainability Transitions in Local Contexts (GSTLC)**	ENG
96004	**At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms**	ENG
96001	**We DO Change: Reshaping Organizations for Global Impact**	ENG
96002	**Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures**	ENG

Remark

This module handbook only lists the electives. Core and major modules are described in the handbooks of the Master programs Environmental and Forest Sciences separately.

Terms used

This Module handbook is derived automatically from the online platform, which did not translate all terms into English. Here is a list for the terms to enable full comprehension:

DE	ENG
In jedem Wintersemester	Every winter semester
Lehrveranstaltung	Course
Pflicht (P)	Mandatory
Veranstaltung	Event
Wahlpflicht (WP)	Elective

--- Deutsche Version ---

Wahlpflichtfächer (WP)

Dieses Handbuch beschreibt alle Wahlpflichtfächer der beiden Studiengänge MSc Umweltwissenschaften/Environmental Sciences und MSc Forstwissenschaften/Forest Sciences das Sommersemester 2025. Die Wahlpflichtfächer variieren in Bezug auf Thema, Sprache, Dauer, Art des Unterrichtens und Häufigkeit.
Die hier beschriebenen Module können in den folgenden Semestern angeboten werden, müssen es aber nicht. Für jedes Semester wird eine Liste veröffentlicht, die alle angebotenen Wahlpflichtfächer enthält. Sie wird über die Mailinglisten der Programmkoordinatorin sowie auf den Webseiten der Masterprogramme bereitgestellt.
Für die Teilnahme an einem Wahlfach müssen sich die Studierenden über die Online-Plattform HisInOne innerhalb der Belegungszeiträume, die bei jedem Modul angegeben sind, anmelden. Die Teilnahme kann nur bis zu einer maximalen Anzahl von Studierenden pro Modul garantiert werden.

Sprache

Die Wahlpflichtfächer werden entweder in deutscher oder englischer Sprache angeboten. Die Sprache für die Beschreibung der einzelnen Module ist daher die Unterrichtssprache.

Aufbau der Module innerhalb des Studiengangs

1) Kernmodule / Grundlagenbereich:
Drei Kernmodule (15 ECTS) sind für alle Studierenden verpflichtend. Sie werden im ersten und dritten Semester angeboten.

2) Profillinien-Module:
Diese Module sind für die gewählte Profillinie obligatorisch. Insgesamt sind 10 Profillinienmodule im Umfang von 50 ECTS zu belegen, in der Regel im ersten, zweiten und dritten Semester.

3) Wahlpflichtfächer:
Während des Studiums müssen drei Wahlpflichtfächer im Umfang von 15 ECTS belegt werden. Die Studierenden können aus einem variablen Angebot an Modulen für die beiden Masterstudiengänge MSc Forstwissenschaften / Forest Sciences und MSc Umweltwissenschaften / Environmental Sciences wählen. Es können auch Module aus anderen Masterstudiengängen der Fakultät, der Universität oder außerhalb der Universität gewählt werden, sofern ein fachlicher Bezug besteht. Über die Eignung entscheidet der Prüfungsausschuss nach Maßgabe des jeweiligen Studienschwerpunkts. Sprachkurse werden nicht als geeignete Lehrveranstaltungen anerkannt.

Wahlpflichtmodule im Sommersemester 2025

Im Sommersemester werden die Module in einem dreiwöchigen Block nach der Vorlesungszeit am Ende des Semesters angeboten.

Number	Name	Sprache
64125	**Marine Ecology**	ENG
64086	**Analyse forstlicher Arbeitssysteme**	DE
64111	**Plants Make Scents**	ENG

13012	**Gräser und Grasartige – Bestimmen und Erkennen**	DE
13015	**Forest Genetics Research Lab**	ENG
13018	**Diagnostic Methods for Tree Diseases**	ENG
13026	**Agroforstsysteme**	DE
13030	**Historical timber trade**	ENG
13031	**Human-wildlife interactions in mountain landscapes**	ENG
13032	**Inventory and Evaluation in Nature Conservation**	ENG
91813/ 93936	**Global Sustainability Transitions in Local Contexts (GSTLC)**	ENG
96004	**At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms**	ENG
96001	**We DO Change: Reshaping Organizations for Global Impact**	ENG
96002	**Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures**	ENG

Bemerkung

In diesem Modulhandbuch sind nur die Wahlpflichtmodule aufgeführt. Kern- und Profillinien-Module sind in den Handbüchern der Masterstudiengänge MSc Umwelt- und Forstwissenschaften gesondert aufgeführt.

Verwendete Begriffe

Dieses Modulhandbuch wurde automatisch von der Online-Plattform übernommen, die nicht alle Begriffe ins Englische übersetzt hat. Hier ist eine Liste der nicht-übersetzten Begriffe, um ein vollständiges Verständnis zu ermöglichen

DE	ENG
In jedem Wintersemester	Every winter semester
Lehrveranstaltung	Course
Pflicht (P)	Mandatory
Veranstaltung	Event
Wahlpflicht (WP)	Elective

Name of node	Number of node
Elective modules	10LE07KT-WPF-2023-13000
Faculty	
Faculty of Environment and Natural Resources	

Compulsory/Elective (C/E)	Elective

↑

Name of module	Number of module
Gräser und Grasartige - Bestimmen und Erkennen	10LE07MO-M.13012
Responsible	
Dr. Choimaa Dulamsuren Dr. Winfried Meier	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Recommended semester	2
Duration	1 Semester
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
Keine
Recommended requirement
Erfahrung im Pflanzenbestimmen

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Gräser und Grasartige - Bestimmen und Erkennen	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
Zu den Gräsern und Grasartigen rechnet man nach dem heutigen System der Systematik die eigentlichen Süßgräser (Poaceae), die Sauergräser (Cyperaceae) und die Binsengewächse (Juncaceae). Stellenweise sind sie landschaftsbeherrschend sowohl in der Kulturlandschaft als auch in der vom Menschen nicht oder kaum berührten Natur. Wenige Vertreter sind überlebenswichtig für die Ernährung der Menschheit (Mais, Reis, Getreide). Viele Arten sind sehr gute Standortszeiger und daher sehr gut geeignet als Indikatorarten für die verschiedenen Umweltbedingungen. Viele Arten kommen an Sonderstandorten vor (z. B. Moore, Feuchtbiotope), kommen oft nur selten vor und sind besonders durch die Zerstörung ihrer Habitate in Ihrem Bestand bedroht. Der Kurs beginnt am 18. April mit einer Einführung in die Kursinhalte und erstes Bestimmen von Pflanzen. Der Kurs gliedert sich in einen Bestimmungs- und Exkursionsteil. Im Bestimmungsteil bestimmen die Studierenden im Kursraum mithilfe eines Binokulars und aktueller Bestimmungsliteratur (vor allem dem „Rothmaler“) die Pflanzen. Im Exkursionsteil lernen die Teilnehmer in sechs meist halbtägigen Exkursionen die Pflanzen in ihren Habitaten kennen, wie Äcker, Ruderalstandorte, Wiesen, Weiden, Sümpfe, Moore. Alle Exkursionsziele sind mit öffentlichen Verkehrsmitteln erreichbar. Dieses Modul richtet sich an Studierende mit schon bestehenden Erfahrungen im Bestimmen von Pflanzen, die ihre Kompetenzen im Bestimmen der Grasartigen vertiefen möchten.

Qualification
■ Kritisches Bestimmen der Gräser und Grasartigen mit der Bestimmungsliteratur sowie das „Ansprechen“ der Arten im Gelände. ■ Verschaffen eines Überblickes über die außerordentliche Formenvielfalt und Standortsvielfalt dieser Gruppe.
Examination achievement
Herbarium
Course achievement
Keine
Teaching method
Praktikum, Bestimmen mit Binokular im Kursraum, Exkursionen
Literature
■ Jäger (E. J.): Rothmaler. Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband (kann für den Kurs zusammen mit einer Handlupe ausgeliehen werden.

↑

Name of module	Number of module
Gräser und Grasartige - Bestimmen und Erkennen	10LE07MO-M.13012
course	
Gräser und Grasartige - Bestimmen und Erkennen	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13012/ B.63130

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Recommended semester	4
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	german
Group size	15

Contents

Zu den Gräsern und Grasartigen rechnet man nach dem heutigen System der Systematik die eigentlichen Süßgräser (Poaceae), die Sauergräser (Cyperaceae) und die Binsengewächse (Juncaceae). Stellenweise sind sie landschaftsbeherrschend sowohl in der Kulturlandschaft als auch in der vom Menschen nicht oder kaum berührten Natur. Wenige Vertreter sind überlebenswichtig für die Ernährung der Menschheit (Mais, Reis, Getreide). Viele Arten sind sehr gute Standortszeiger und daher sehr gut geeignet als Indikatorarten für die verschiedenen Umweltbedingungen. Viele Arten kommen an Sonderstandorten vor (z. B. Moore, Feuchtbiotope), kommen oft nur selten vor und sind besonders durch die Zerstörung ihrer Habitate in Ihrem Bestand bedroht.
Der Kurs gliedert sich in einen Bestimmungs- und Exkursionsteil.
Im Bestimmungsteil bestimmen die Studierenden im Kursraum mithilfe eines Binokulars und aktueller Bestimmungsliteratur (vor allem dem „Rothmaler“) die Pflanzen.
Im Exkursionsteil lernen die Teilnehmer in sechs meist halbtägigen Exkursionen die Pflanzen in ihren Habitaten kennen, wie Äcker, Ruderalstandorte, Wiesen, Weiden, Sümpfe, Moore. Alle Exkursionsziele sind mit öffentlichen Verkehrsmitteln erreichbar.
Dieses Modul richtet sich an Studierende mit schon bestehenden Erfahrungen im Bestimmen von Pflanzen, die ihre Kompetenzen im Bestimmen der Grasartigen vertiefen möchten.

Am ersten Tag des Moduls besteht Anwesenheitspflicht!

Qualification

- Kritisches Bestimmen der Gräser und Grasartigen mit der Bestimmungsliteratur sowie das „Ansprechen“ der Arten im Gelände.
- Verschaffen eines Überblickes über die außerordentliche Formenvielfalt und Standortsvielfalt dieser Gruppe.

Examination achievement

Herbarium

Course achievement

Keine

Literature
■ Jäger (E. J.): Rothmaler. Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband (kann für den Kurs zusammen mit einer Handlupe ausgeliehen werden.
Compulsory requirement
Keine
Recommended requirement
Erfahrung im Pflanzenbestimmen
Teaching method
Praktikum, Bestimmen mit Binokular im Kursraum, Exkursionen

↑

Name of module	Number of module
Forest Genetics Research Lab	10LE07MO-M.13015
Responsible	
Prof. Dr. Katrin Heer	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	60 h
Independent study	90 h
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
none

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Forest Genetics Research Lab	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
Introduction and participation in ongoing research projects in Forest Genetics.
Qualification
After completing this course, students will (have): ■ Knowledge about the different genetic analysis techniques and applications for handling experimental data generated by forest science. ■ Ability to apply these techniques and applications to real-world data, thereby integrating genetic/genomic methods into their professional and/or research work. ■ Ability to critically access publicly- available online information in the specific field of the subject (genomic databases, scientific articles, bioinformatics tools, etc.) and have sufficient knowledge about its interpretation and use. ■ Write, present, and interpret scientific literature. ■ Develop skills to pursue further studies with a high degree of autonomy.
Examination achievement
Written report (on research projects)

Course achievement
None
Teaching method
Lectures, practicals, seminar
Literature
Scientific literature will be provided during the course

↑

Name of module	Number of module
Forest Genetics Research Lab	10LE07MO-M.13015
course	
Forest Genetics Research Lab	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13015

ECTS-Points	5.0
Workload	150 h
Attendance	60 h
Independent study	90 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english

Contents
The students will be introduced to ongoing research projects in the Forest Genetics lab. Afterwards, they will develop their own research projects by creating hypotheses and a study design that are ideally linked to an ongoing project in Forest Genetics. They will collect and analyse the data and write a short report. Ideally, these materials and training can be used as the first step of a Master thesis.
Qualification
After completing this course, students will (have): ■ Knowledge about the different genetic analysis techniques and applications for handling experimental data generated by forest science. ■ Ability to apply these techniques and applications to real-world data, thereby integrating genetic/genomic methods into their professional and/or research work. ■ Ability to critically access publicly- available online information in the specific field of the subject (genomic databases, scientific articles, bioinformatics tools, etc.) and have sufficient knowledge about its interpretation and use. ■ Write, present, and interpret scientific literature. ■ Develop skills to pursue further studies with a high degree of autonomy.
Examination achievement
Written report (on research projects)
Course achievement
None
Literature
Scientific literature will be provided during the course
Compulsory requirement
None

Recommended requirement
Basic knowledge in population genetics/forest genetics. It is recommended to have used R programming language previously.
Teaching method
Lectures, practicals, seminar

↑

Name of module	Number of module
Diagnostic Methods for Tree Diseases	10LE07MO-M.13018
Responsible	
JProf. Dr. Kathrin Blumenstein	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	110 h
Independent study	40 h
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
none

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Diagnostic Methods for Tree Diseases	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
The module "Diagnostic Methods for Tree Diseases," has a special focus on fungal pathogens, integrating theoretical learning with practical application.
Qualification
Students will be qualified to: ■ Understand and apply various diagnostic methods in the field of forest pathology and tree disease identification. ■ Extract and evaluate methodological descriptions from scientific literature, enhancing their research and analytical skills. ■ Perform classical diagnostic methods such as microscopic examination and morphological identification of tree diseases. ■ Identify fungal pathogens using molecular techniques like DNA extraction and Polymerase Chain Reaction. ■ Apply non-invasive techniques like sonic tomography for internal tree damage assessment. ■ Present research findings effectively and compile comprehensive reports, demonstrating enhanced scientific communication skills.

Learning Aims:

- Provide a thorough understanding of various diagnostic methods used in forest pathology, with a special focus on fungal pathogens.
- Equip students with the ability to critically analyze and apply theoretical knowledge to practical situations in tree disease diagnosis.
- Develop proficiency in classical diagnostic techniques, laying a foundation for understanding tree diseases at a fundamental level.
- Train students in advanced molecular genetic techniques, emphasizing their application for precise identification of fungal DNA in tree diseases.
- Enhance students' research capabilities, enabling them to independently extract and evaluate information from scientific texts.
- Foster skills in scientific communication, through the presentation of findings and report writing, preparing students for professional roles in plant pathology and related fields.

Examination achievement
Presentation (70%), Written Assignment (30%)
Course achievement
Keine
Teaching method
Short lectures, practical student projects, seminars
Literature
Literature and protocols will be provided during the module, according to the corresponding methods and experiments.

↑

Name of module	Number of module
Diagnostic Methods for Tree Diseases	10LE07MO-M.13018
course	
Diagnostic Methods for Tree Diseases	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13018

ECTS-Points	5.0
Workload	150 h
Attendance	110 h
Independent study	40 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english

Contents

The module "Diagnostic Methods for Tree Diseases," has a special focus on fungal pathogens, integrating theoretical learning with practical application.

In the seminar segment of the course, students will learn about various diagnosis methods that are applied in the field of forest pathology and tree disease identification and the theoretical background of these applications. Also, the students will experience how to extract methodological descriptions from scientific articles and how to evaluate their usage.

Moving to the practical aspect, the course offers hands-on experience in identifying and analyzing symptoms of biotic damage in trees. Students will be trained in classical methods such as microscopic examination and morphological identification. A significant portion of the course is dedicated to laboratory work such as DNA extraction and Polymerase Chain Reaction (PCR). Those methods are going to be applied in the lab and in the field, respectively, by each student, guided by us. These methods are invaluable for their precision in identifying fungal DNA, a key factor in diagnosing and managing tree diseases effectively. Additionally, the course introduces students to techniques like sonic tomography, a non-invasive approach to detecting internal tree damage.

The course concludes with students presenting their findings in the seminar and compiling a detailed written report. These exercises are designed not only to reinforce the knowledge gained but also to enhance students' abilities in scientific communication.

Overall, this module is designed to offer a dynamic and comprehensive educational experience, combining theoretical knowledge with practical skills, to prepare students for advanced roles in forest pathology and environmental sciences.

Qualification

Students will be qualified to:

- Understand and apply various diagnostic methods in the field of forest pathology and tree disease identification.
- Extract and evaluate methodological descriptions from scientific literature, enhancing their research and analytical skills.

- Perform classical diagnostic methods such as microscopic examination and morphological identification of tree diseases.
- Identify fungal pathogens using molecular techniques like DNA extraction and Polymerase Chain Reaction.
- Apply non-invasive techniques like sonic tomography for internal tree damage assessment.
- Present research findings effectively and compile comprehensive reports, demonstrating enhanced scientific communication skills.

Learning Aims:
- Provide a thorough understanding of various diagnostic methods used in forest pathology, with a special focus on fungal pathogens.
- Equip students with the ability to critically analyze and apply theoretical knowledge to practical situations in tree disease diagnosis.
- Develop proficiency in classical diagnostic techniques, laying a foundation for understanding tree diseases at a fundamental level.
- Train students in advanced molecular genetic techniques, emphasizing their application for precise identification of fungal DNA in tree diseases.
- Enhance students' research capabilities, enabling them to independently extract and evaluate information from scientific texts.
- Foster skills in scientific communication, through the presentation of findings and report writing, preparing students for professional roles in plant pathology and related fields.

Examination achievement
Presentation (70%), Written Assignment (30%)
Course achievement
None
Literature
Literature and protocols will be provided during the module, according to the corresponding methods and experiments.
Compulsory requirement
None
Recommended requirement
Interest in microbiology, esp. mycology
Teaching method
Short lectures, practical student projects, seminars

↑

Name of module	Number of module
Plants make Scents	10LE07MO-M.64111
Responsible	
PD Dr. Jürgen Kreuzwieser	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	60 h
Independent study	90 h
Recommended semester	2
Duration	3 Wochen Block
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
none

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Plants make Scents	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	

Contents
Plants emit a wide range (some thousands) of volatile compounds into the atmosphere (=biogenic vola tile organic compounds, BVOC). BVOCs include isoprenoids (isoprene, monoterpenes, esquiterpenes, diterpenes) as well as alkanes, alkenes, carbonyls, alcohols, esters, ethers, and acids. Emission inventories show isoprene and monoterpenes as the most prominent compounds. Alcohols and carbonyls follow the isoprenoids as the most predominant groups. Emission occurs mainly from the leaves of vegetation although stems and roots can also release BVOCs into the nvironment. BVOC fulfill a plethora of functions within plants, mainly in defence againt biotic and abiotic stress. For example, they seem to protect plants against heat stress as well as other oxidative stress factors (ozone, drought). Moreover they protect plant against herbivores and are involved in plant-plant, plant-microbia and plant-animal interaction.In the module, students will participate in different lectures on the ecology as well as biosynthesis and functions of BVOCs. An additional focus will be on analytical aspects. We will perform simple experiments in which we will analyze typical plant-released volatiles. Sets of raw data will thereafter be analyzed and emission rates and plant-internal contents of typical compounds will be calculated.
Qualification
Students will ■ deepen the knowledge on plant primary and secondary metabolisms ■ understand the functions and physiology of volatile organic compounds in plants

■ learn and apply modern analytical instruments (e.g. thermodesorption-gas chromatography-mass spec ■ trometry) ■ gain thorough understanding of GC-Ms technique, analysis of complex sets of raw data ■ gain a critical view on measuring data, deliberating the pros and cons of different measuring techniques
Examination achievement
Written assignment: Protocol (10-15 pages)
Course achievement
None
Teaching method
Lectures, exercises
Literature
■ Kesselmeier J, Staudt M (1999) Biogenic Volatile Organic Compounds (VOC): An Overview on Emission, Physiology and Ecology. Journal of Atmospheric Chemistry 33, Issue 1, 23–88. ■ More literature will be handed out during the course

↑

Name of module	Number of module
Plants make Scents	10LE07MO-M.64111
course	
Plants make Scents	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07Ü-M.64111

ECTS-Points	5.0
Attendance	60 h
Independent study	90 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each winter term
Compulsory/Elective (C/E)	Core elective
Language	english

Contents

Plants emit a wide range (some thousands) of volatile compounds into the atmosphere (=biogenic vola tile organic compounds, BVOC). BVOCs include isoprenoids (isoprene, monoterpenes, esquiterpenes, diterpenes) as well as alkanes, alkenes, carbonyls, alcohols, esters, ethers, and acids. Emission inventories show isoprene and monoterpenes as the most prominent compounds. Alcohols and carbonyls follow the isoprenoids as the most predominant groups. Emission occurs mainly from the leaves of vegetation although stems and roots can also release BVOCs into the nvironment. BVOC fulfill a plethora of functions within plants, mainly in defence againt biotic and abiotic stress. For example, they seem to protect plants against heat stress as well as other oxidative stress factors (ozone, drought). Moreover they protect plant against herbivores and are involved in plant-plant, plant-microbia and plant-animal interaction.In the module, students will participate in different lectures on the ecology as well as biosynthesis and functions of BVOCs. An additional focus will be on analytical aspects. We will perform simple experiments in which we will analyze typical plant-released volatiles. Sets of raw data will thereafter be analyzed and emission rates and plant-internal contents of typical compounds will be calculated.

Qualification

Students will
- deepen the knowledge on plant primary and secondary metabolisms
- understand the functions and physiology of volatile organic compounds in plants
- learn and apply modern analytical instruments (e.g. thermodesorption-gas chromatography-mass spectrometry)
- gain thorough understanding of GC-Ms technique, analysis of complex sets of raw data
- gain a critical view on measuring data, deliberating the pros and cons of different measuring techniques

Examination achievement

written coursework

Course achievement

None

Literature

- Kesselmeier J, Staudt M (1999) Biogenic Volatile Organic Compounds (VOC): An Overview on Emission, Physiology and Ecology. Journal of Atmospheric Chemistry 33, Issue 1, 23–88.

■ More literature will be handed out during the course
Compulsory requirement
none
Teaching method
Lectures, exercises

↑

Name of module	Number of module
Global Sustainability Transformations in Local Contexts	10LE08MO-M.91813
Responsible	
Prof. Dr. Cathrin Zengerling	
Faculty	
Faculty of Environment and Natural Resources	

ECTS-Points	5.0
Workload	150h
Hours of week	4.0
Attendance	tbc
Independent study	tbc
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Global Sustainability Transformations in Local Contexts	seminar	Core elective	5.0	4.0	150 h

Contents
In this module, students learn about cities and municipalities as actors in an emerging system of polycentric environmental governance. They gain knowledge on the role of local governments within the Paris Agreement, TMNs as well as national state hierarchies in different legal systems and the respective local scope of action. We explore different modes of governing processes of transformation across different sectors (energy, mobility, food, housing and others) as well as scales (neighbourhood, city, translocal) in international case studies in the global north and south. The key forms of local decision-making (including referendums), formal as well as informal steering instruments including land use plans, urban development contracts and climate action plans are introduced. Students also get insights into the relationship and forms of cooperation between urban and (surrounding) rural areas in the context of the (energy) transition. With regard to local and community economies, students learn about (re)municipalisation, eco-social enterprises and community initiatives. We discuss alternative forms of ownership such as cooperatives and sharing schemes, in particular in the context of alternative economies and degrowth.
Qualification
In this module students learn to: ■ develop a critical understanding of contemporary processes of urban sustainability transformations with a main focus on the sectors of energy, mobility, housing and food (1,2); ■ understand the role of cities in emerging polycentric environmental governance, varying local scopes of action and key formal and informal steering instruments of urban governance (2,3);

- discuss and reflect upon the role of law and planning in urban sustainability transformations, (2,4);
- analyse academic publications, legal and policy documents and other planning-related materials (3,4);
- apply their knowledge to case studies of contemporary urban transformation processes in their field of interest (3,4,5);
- compare, contrast, and transfer their knowledge to other cases (5, 6).

Classification of cognitive skills following Bloom (1956):
1 = Knowledge: recalling facts, terms, basic concepts and answers; 2 = Comprehension: understanding something; 3 = Application: using a general concept to solve problems in a particular situation; 4 = Analysis: breaking something down into its parts; 5 = Synthesis: creating something new by putting parts of different ideas together to make a whole; 6 = Evaluation: judging the value of material or methods.

Examination achievement
Group presentation (30%), Individual essay (40%), Group Case Study (30%)
Course achievement
None
Teaching method
lectures, thematic seminar sessions, guided reading and assignments, group work and discussions
Literature

A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form. The following are some examples of texts we will be reading in the course:

- Kraas, F., Leggewie, C., Lemke, P., Matthies, E., Messner, D., Nakicenovic, N., ... & Butsch, C. (2016). Humanity on the move: Unlocking the transformative power of cities. WBGU-German Advisory Council on Global Change.

Reading material will be provided during the course via the e-learning platform ILIAS.

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Name of module	Number of module
Global Sustainability Transformations in Local Contexts	10LE08MO-M.91813
course	
Global Sustainability Transformations in Local Contexts	
Event type	Number
seminar	10LE08V-M.91813/93936

ECTS-Points	5.0
Workload	150 h
Attendance	tbc.
Independent study	tbc.
Hours of week	4.0
Recommended semester	2
Frequency	takes place once or irregularly
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	40

Contents

Cities consume about 75% of global energy and material flows and are home to more than half of the global population – with a rising tendency. They are an increasingly visible actor in emerging polycentric environmental governance, engage in international legal regimes such as the Paris Agreement and transnational municipal networks (TMNs). Infrastructures and lifestyles in local systems are crucial for people's well-being within planetary boundaries. Many processes of sustainability transformations around energy, mobility, food, housing, and consumer goods are rooted in local systems. They offer room for experiments and niches and allow for first steps in diffusion and upscaling. Local governments can be closer to people and more responsive to specific local needs and conditions than higher levels of government. Local economies play a key role in value creation and capture

In this module, students learn about cities and municipalities as actors in an emerging system of polycentric environmental governance. They gain knowledge on the role of local governments within the Paris Agreement, TMNs as well as national state hierarchies in different legal systems and the respective local scope of action. We explore different modes of governing processes of transformation across different sectors (energy, mobility, food, housing and others) as well as scales (neighbourhood, city, translocal) in international case studies in the global north and south. The key forms of local decision-making (including referendums), formal as well as informal steering instruments including land use plans, urban development contracts and climate action plans are introduced. Students also get insights into the relationship and forms of cooperation between urban and (surrounding) rural areas in the context of the (energy) transition. With regard to local and community economies, students learn about (re)municipalisation, eco-social enterprises and community initiatives. We discuss alternative forms of ownership such as cooperatives and sharing schemes, in particular in the context of alternative economies and degrowth.

The course is taught in an interactive manner. We will kick off our joint work with an explorative zero carbon walk in a Freiburg neighbourhood. Throughout the course, we present and discuss international case studies and students get the chance to deepen their knowledge in their main fields of interest. The course also encompasses an excursion to the new low carbon urban development project Dietenbach and discussions with representatives of the urban planning department.

Qualification
In this module students learn to: ■ develop a critical understanding of contemporary processes of urban sustainability transformations with a main focus on the sectors of energy, mobility, housing and food (1,2); ■ understand the role of cities in emerging polycentric environmental governance, varying local scopes of action and key formal and informal steering instruments of urban governance (2,3); ■ discuss and reflect upon the role of law and planning in urban sustainability transformations, (2,4); ■ analyse academic publications, legal and policy documents and other planning-related materials (3,4); ■ apply their knowledge to case studies of contemporary urban transformation processes in their field of interest (3,4,5); ■ compare, contrast, and transfer their knowledge to other cases (5, 6). Classification of cognitive skills following Bloom (1956): 1 = Knowledge: recalling facts, terms, basic concepts and answers; 2 = Comprehension: understanding something; 3 = Application: using a general concept to solve problems in a particular situation; 4 = Analysis: breaking something down into its parts; 5 = Synthesis: creating something new by putting parts of different ideas together to make a whole; 6 = Evaluation: judging the value of material or methods.
Examination achievement
Group presentation (30%), Individual essay (40%), Group Case Study (30%)
Course achievement
None
Literature
A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form. The following are some examples of texts we will be reading in the course: ■ Kraas, F., Leggewie, C., Lemke, P., Matthies, E., Messner, D., Nakicenovic, N., ... & Butsch, C. (2016). Humanity on the move: Unlocking the transformative power of cities. WBGU-German Advisory Council on Global Change. Reading material will be provided during the course via the e-learning platform ILIAS.
Compulsory requirement
None
Teaching method
lectures, thematic seminar sessions, guided reading and assignments, group work and discussions

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Name of module	Number of module
Marine Ecology	10LE07MO-M.64125
Responsible	
Prof. Dr. Carsten Dormann	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	100 h
Independent study	50 h
Recommended semester	2
Duration	3 Wochen Block
Compulsory/Elective (C/E)	Core elective
Frequency	takes place once or irregularly

Compulsory requirement
none

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Marine Ecology	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
The module introduces students to the marine system, fosters them to think about a specific issue in the seminar and gives first-hand experience during a 8-day excursion to the North Sea (Helgoland and Cuxhaven). ■ Lectures on oceanography; ■ primary productivity and forms of algae ■ secondary productivity and forms of marine animals; sex in the ocean; food webs ■ the oceanic carbon cycle ■ ocean habitats/systems ■ human use of the marine environment The seminar will focus on selected topics, e.g. microplastics, algal blooms, ocean acidification etc., which will be presented by the students.
Qualification
■ Knowledge about the ocean as a physico-chemical and biological system (1, 2) ■ Comparing terrestrial and marine systems (4, 5) ■ Application to specific scientific topics (3, 5, 6)

- Identification of common species of the Wadden Sea (1, 2)
- laboratory work on selected species and their ecology (1, 2, 3)
- small ecological projects on marine topics (3, 5, 6)
- Klassifikation der Qualifikations- und Lernziele nach BLOOM (1973):
  1= Kenntnisse: Wissen reproduzieren können; 2= Verständnis: Wissen erläutern können; 3= Anwendung: Wissen anwenden können; 4= Analyse: Zusammenhänge analysieren können; 5= Synthese: eigene Problemlösestrategien angeben können; 6= Beurteilung: eigene Problemlösestrategien beurteilen können

Examination achievement
Written report, oral presentation in seminar
Course achievement
None
Teaching method
Lectures Seminar Excursion
Literature

- Levinton, J. (2017). Marine Biology: Function, Biodiversity, Ecology (5th edition). Oxford University Press Inc.
- Dormann & Schröder (2022) Marine Ecology Notes. https://open.umn.edu/opentextbooks/textbooks/1011

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Name of module	Number of module
Marine Ecology	10LE07MO-M.64125
course	
Marine Ecology	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.64125/B.3108

ECTS-Points	5.0
Workload	150 h
Attendance	100 h
Independent study	50 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place once or irregularly
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	20

Contents

The module introduces students to the marine system, fosters them to think about a specific issue in the seminar and gives first-hand experience during a 8-day excursion to the North Sea (Helgoland and Cuxhaven).

- Lectures on oceanography;
- primary productivity and forms of algae
- secondary productivity and forms of marine animals; sex in the ocean; food webs
- the oceanic carbon cycle
- ocean habitats/systems
- human use of the marine environment

The seminar will focus on selected topics, e.g. microplastics, algal blooms, ocean acidification etc., which will be presented by the students.

Qualification

- Knowledge about the ocean as a physico-chemical and biological system
- Comparing terrestrial and marine systems
- Application to specific scientific topics
- Identification of common species of the Wadden Sea
- laboratory work on selected species and their ecology
- small ecological projects on marine topics

Examination achievement

Written report, oral presentation in seminar

Course achievement

None

Literature
■ Levinton, J. (2017). Marine Biology: Function, Biodiversity, Ecology (5th edition). Oxford University Press Inc. ■ Dormann & Schröder (2022) Marine Ecology Notes. https://open.umn.edu/opentextbooks/textbooks/1011
Compulsory requirement
None
Recommended requirement
Foundations in ecology and geography
Teaching method
Lectures, Seminar, Excursion

↑

Name of module	Number of module
Historical Timber Trade	10LE07MO-M.13030
Responsible	
Dr. Andrea Heidemarie Seim	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	100 h
Independent study	50 h
Recommended semester	2
Duration	3 weeks block
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
none

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Historical Timber Trade	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
This module offers a comprehensive introduction to the history of the timber trade, one of the most significant economic sectors in world history. It explores the diverse aspects of the timber trade and its far-reaching impacts on society, the economy, and the environment. Students will gain an understanding of the historical importance of wood as a resource and the complex trade networks that developed over centuries.
Qualification
The students will be able to ■ describe different trading centres and the established trade routes ■ explain different methods to investigate the historical timber trade (such as dendroarchaeology, analysis of written sources) ■ sample and analyse historical timber and explain the importance of timber in past societies ■ critically interpret historical sources ■ scientifically present and discuss results ■ plan and complete tasks together with others
Examination achievement
Presentation (individual 70%), Essay (group, 30%)

Course achievement
None
Teaching method
Lectures, group and individual work, presentations, discussion
Literature
Will be announced at the beginning of the module.

↑

Name of module	Number of module
Historical Timber Trade	10LE07MO-M.13030
course	
Historical Timber Trade	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13030

ECTS-Points	5.0
Workload	150 h
Attendance	100 h
Independent study	50 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english

Contents

This module offers a comprehensive introduction to the history of the timber trade, one of the most significant economic sectors in world history. It explores the diverse aspects of the timber trade and its far-reaching impacts on society, the economy, and the environment. Students will gain an understanding of the historical importance of wood as a resource and the complex trade networks that developed over centuries.
We will be examining the role of wood in architecture, shipbuilding, and as an economic driver. Key questions are addressed: Which regions dominated the timber trade in which periods, and how were trade routes organised? Special attention is given to historical timber trade centres, e.g., Hanseatic cities. Students analyse how the timber trade served as a catalyst for economic interconnectedness of goods (timber) and ideas between different regions.
Practical work includes, for example, measuring and investigating historical timber from a trading centre (the Black Forest), identifying the source regions of traded material in panel paintings from Flemish old masters (dendroprovenancing) and studying historical sources (e.g., toll accounts and maps). Invited lectures will complement the module by covering different aspects.
This module integrates historical, economic, and ecological perspectives, offering an interdisciplinary approach. Students develop critical analytical skills and a deeper understanding of the long-term impacts of economic activities.

Qualification

The students will be able to
- describe different trading centres and the established trade routes
- explain different methods to investigate the historical timber trade (such as dendroarchaeology, analysis of written sources)
- sample and analyse historical timber and explain the importance of timber in past societies
- critically interpret historical sources
- scientifically present and discuss results
- plan and complete tasks together with others

Examination achievement

Presentation (individual 70%), Essay (group, 30%)

Course achievement
None
Literature
Will be announced at the beginning of the module.
Compulsory requirement
None
Teaching method
Lectures, group and individual work, presentations, discussion

↑

Name of module	Number of module
Agroforstsysteme	10LE07MO-M.13026
Responsible	
Dr. Christopher Morhart	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	65 h
Independent study	85 h
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Agroforstsysteme	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
In diesem dreiwöchigen Modul wird das Thema Agroforstsysteme (AFS) mit Schwerpunkt auf Mitteleuropa betrachtet. Die Teilnehmenden lernen in Vorlesungen und auf Exkursionen die Grundprinzipien von AFS kennen, bewerten Vor- und Nachteile und analysieren das Potenzial von AFS. Der Kurs vermittelt theoretische Grundlagen, Bewertungsmethoden sowie Planungsprinzipien von AFS. Studierende arbeiten in Gruppen an Forschungsthemen, die sie in einer abschließenden Diskussionsrunde präsentieren.
Qualification
Die Studierenden sind in der Lage ■ die grundlegenden Prinzipien von AFS zu erläutern und haben ein Verständnis für die Zusammenhänge (2) ■ Umweltfaktoren zu beschreiben, die die Interaktionen in AFS beeinflussen (2) ■ den Einfluss unterschiedlicher Umweltfaktoren auf die Wachstumsparameter von Bäumen in AFS zu erkennen und zu beschreiben (2) ■ Methoden zur Quantifizierung der Baumbiomasse in AFS anzuwenden (3) ■ die standortspezifische Planung eines geeigneten AFS durchzuführen (4, 5) ■ neue Methoden und Konzepte in der Agroforstforschung zu analysieren und diskutieren (5) ■ einen „wissenschaftlichen Berichts“ zu erstellen und eine „wissenschaftliche Präsentation“ zu halten (6).

Klassifikation der Qualifikations- und Lernziele nach BLOOM (1973): 1= Kenntnisse: Wissen reproduzieren können; 2= Verständnis: Wissen erläutern können; 3= Anwendung: Wissen anwenden können; 4= Analyse: Zusammenhänge analysieren können; 5= Synthese: eigene Problemlösestrategien angeben können; 6= Beurteilung: eigene Problemlösestrategien beurteilen können
Examination achievement
Portfolio: Schriftliche Arbeit (individuell, 70%), mündlicher Vortrag (Gruppe, 30%)
Course achievement
Keine
Teaching method
Vorlesungen, Exkursionen, Gruppenarbeiten, Projektpräsentationen, Diskussionsrunden
Literature
Eine Liste mit relevanter Literatur wird zu Beginn des Kurses über ILIAS in digitaler Form zur Verfügung gestellt.

↑

Name of module	Number of module
Agroforstsysteme	10LE07MO-M.13026
course	
Agroforstsysteme	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13026

ECTS-Points	5.0
Workload	150 h
Attendance	65 h
Independent study	85 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	german

Contents

In diesem dreiwöchigen Modul wird das Thema Agroforstsysteme (AFS) mit besonderem Schwerpunkt auf AFS in Mitteleuropa aus verschiedensten Blickwinkeln betrachtet.
AFS, die landwirtschaftliche Produktion mit Bäumen oder Sträuchern kombinieren, gewinnen in den letzten Jahren immer mehr an Aufmerksamkeit. Es ist zwar bekannt, dass AFS deutlich mehr Ökosystemleistungen im Vergleich zu klassischen Produktionssystemen bereitstellen und besser mit den prognostizierten Risiken des globalen Wandels umgehen können.
Trotz dieser anerkannten Vorteile, die auch im IPCC-Bericht hervorgehoben werden—wo AFS als Landnutzungssystem mit hohem Potenzial zur Minderung von Wüstenbildung, Bodendegradation und zur Verbesserung der Ernährungssicherheit thematisiert werden—spielen sie in der mitteleuropäischen Landwirtschaft gegenwärtig noch immer eine untergeordnete Rolle.
In diesem Modul lernen die TeilnehmerInnen die Prinzipien der Agroforstwirtschaft kennen, bewerten ihre Vor- und Nachteile und analysieren das Potenzial von AFS in der modernen Landwirtschaft.
Durch Exkursionen zu verschiedenen AFS haben die Teilnehmenden die Möglichkeit, ökologische, soziale und ökonomische Aspekte unterschiedlicher AFS, die stark von der jeweiligen geografischen Region und den spezifischen Produktionszielen abhängen, kennenzulernen und diese zu diskutieren.

Der Kurs führt die Studierenden nicht nur in die theoretischen Grundlagen und Bewertungsmethoden von AFS ein, sondern vermittelt auch die Grundprinzipien der Planung und Umsetzung solcher Systeme. Darüber hinaus arbeiten die TeilnehmerInnen in kleinen Gruppen an ausgewählten Forschungsthemen, die sie in Form einer Projektpräsentation im Rahmen einer abschließenden Diskussionsrunde vorstellen.

Qualification

Die Studierenden sind in der Lage
- die grundlegenden Prinzipien von AFS zu erläutern und haben ein Verständnis für die Zusammenhänge (2)
- Umweltfaktoren zu beschreiben, die die Interaktionen in AFS beeinflussen (2)
- den Einfluss unterschiedlicher Umweltfaktoren auf die Wachstumsparameter von Bäumen in AFS zu erkennen und zu beschreiben (2)
- Methoden zur Quantifizierung der Baumbiomasse in AFS anzuwenden (3)
- die standortspezifische Planung eines geeigneten AFS durchzuführen (4, 5)
- neue Methoden und Konzepte in der Agroforstforschung zu analysieren und diskutieren (5)

■ einen „wissenschaftlichen Berichts“ zu erstellen und eine „wissenschaftliche Präsentation“ zu halten (6). Klassifikation der Qualifikations- und Lernziele nach BLOOM (1973): 1= Kenntnisse: Wissen reproduzieren können; 2= Verständnis: Wissen erläutern können; 3= Anwendung: Wissen anwenden können; 4= Analyse: Zusammenhänge analysieren können; 5= Synthese: eigene Problemlösestrategien angeben können; 6= Beurteilung: eigene Problemlösestrategien beurteilen können
Examination achievement
Portfolio: Schriftliche Arbeit (individuell, 70%), mündlicher Vortrag (Gruppe, 30%)
Course achievement
Keine
Literature
Eine Liste mit relevanter Literatur wird zu Beginn des Kurses über ILIAS in digitaler Form zur Verfügung gestellt.
Compulsory requirement
Keine
Teaching method
Vorlesungen, Exkursionen, Gruppenarbeiten, Projektpräsentationen, Diskussionsrunden

↑

Name of module	Number of module
Human-wildlife Interactions in Mountain Landscapes	10LE07MO-M.13031
Responsible	
JProf. Dr. Ana Stritih	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	75 h
Independent study	75 h
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Human-wildlife Interactions in Mountain Landscapes	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
The course consists of an introductory seminar and a 4-day field week at the TUM research station Friedrich N. Schwarz and in the Berchtesgaden National Park (shared with students from TUM and with inputs from researchers working in the Park). Students will receive and introduction to the topics of wildlife ecology, different perspectives on human-wildlife interactions, and current challenges in conservation and wildlife management. In the seminar part, they will read and present scientific literature on a selected topic. During the field week in Berchtesgaden, the students will learn to apply their knowledge to specific management challenges in the Berchtesgaden National Park and its surroundings. Current challenges in conservation and wildlife management will be presented in the local context during excursions in the field, where students will also learn about data collection methods. In a group project, students will analyse data to address specific questions related to conservation and wildlife management, and they will present their results in a report and a presentation.
Qualification
Upon successful completion of this module, students will be able to understand current challenges in wildlife conservation and management in mountain landscapes, and tools that can be used for addressing those challenges:

- Students can read, interpret, and present scientific papers, critically evaluate them and discuss their implications for wildlife management.
- Students understand different conservation approaches (protected areas, conservation in managed landscapes) and can discuss the specific challenges of each approach
- Students have basic knowledge on the ecology of ungulates, alpine dwelling grouse and large carnivores in mountain landscapes and their interactions with different human interests in these landscapes
- Students understand various data collection methods on human-wildlife interactions
- Students can conceptualize and apply spatial analyses to address specific management questions, such as prioritizing wildlife conservation measures and identifying potential conflicts with human interests
- Students can present their results in a clear and concise manner, and critically discuss their implications and limitations.

Examination achievement

First presentation (20%), written report 50%, final presentation (30%)

Course achievement

None

Teaching method

The course consists of an introductory seminar and an exercise part, which will take place as a 4-day field week. In the seminar part of the course, students will receive and introduction to the topics of wildlife ecology, current challenges in conservation and wildlife management, and they will read scientific literature on a selected topic.
During the field week, the students will learn to apply their knowledge to specific conservation challenges in the Berchtesgaden National Park and its surroundings. Current challenges in conservation and management will be presented in the local context, and students will learn about data collection methods. In a group exercise, students will analyse data to address specific questions related to conservation and wildlife management, and they will present their results in a report and a presentation.

Literature

Will be provided in the course.

↑

Name of module	Number of module
Human-wildlife Interactions in Mountain Landscapes	10LE07MO-M.13031
course	
Human-wildlife Interactions in Mountain Landscapes	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13031

ECTS-Points	5.0
Workload	150 h
Attendance	75 h
Independent study	75 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	12

Contents

Students will receive and introduction on wildlife ecology, human-wildlife interactions, and current challenges in wildlife conservation and management, and will read scientific literature on a chosen topic. During the seminar part, students will present a selected paper and discuss the implications of its findings for wildlife management. During the block course in Berchtesgaden, the students will learn to apply their knowledge to specific conservation challenges in this mountain landscape.
The topics covered will include:

- Different types of wildlife management and conservation approaches (incl. protected areas, coexistence and management of wildlife in managed landscapes)
- Basic ecology of ungulates, grouse and large carnivores in mountain landscapes and their impacts on ecosystem services
- Current challenges in wildlife management
- Conflicts of interest between different stakeholders in mountain landscapes regarding wildlife
- Methods for data collection on animal abundance and movement
- Methods for data collection on human behavior and perspectives
- Data analysis methods for addressing applied questions in conservation and identifying potential conflicts with human interests
- Presentation and discussion of results

Qualification

Upon successful completion of this module, students will be able to understand current challenges in wildlife conservation and management in mountain landscapes, and tools that can be used for addressing those challenges:

- Students can read, interpret, and present scientific papers, critically evaluate them and discuss their implications for wildlife management.
- Students understand different conservation approaches (protected areas, conservation in managed landscapes) and can discuss the specific challenges of each approach
- Students have basic knowledge on the ecology of ungulates, alpine dwelling grouse and large carnivores in mountain landscapes and their interactions with different human interests in these landscapes
- Students understand various data collection methods on human-wildlife interactions

- Students can conceptualize and apply spatial analyses to address specific management questions, such as prioritizing wildlife conservation measures and identifying potential conflicts with human interests
- Students can present their results in a clear and concise manner, and critically discuss their implications and limitations.

Examination achievement

first presentation (20%), written report (50%), final presentation (30%)

Course achievement

None

Literature

Will be provided in the course.

Compulsory requirement

None

Teaching method

The course consists of an introductory seminar and an exercise part, which will take place as a 4-day field week. In the seminar part of the course, students will receive and introduction to the topics of wildlife ecology, current challenges in conservation and wildlife management, and they will read scientific literature on a selected topic.
During the field week, the students will learn to apply their knowledge to specific conservation challenges in the Berchtesgaden National Park and its surroundings. Current challenges in conservation and management will be presented in the local context, and students will learn about data collection methods. In a group exercise, students will analyse data to address specific questions related to conservation and wildlife management, and they will present their results in a report and a presentation.

↑

Name of module	Number of module
At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms	10LE07MO-M.96004
Responsible	
Prof. Dr. Tanja Mölders Dr. Anna Saave	
Faculty	
Faculty of Environment and Natural Resources Institute of Environmental Social Sciences and Geography, Professorship in Environmental Planning and Transformation-VB	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Attendance	50 h
Independent study	100 h
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
This seminar examines the intersections of labor, capitalism, and society-nature relations, offering students an in-depth look at how capitalism, as a dependent mode of production and a layered system of valorization, operates in its social and ecological context.
Qualification
By the end of this course, students will: ■ understand capitalism as a dependent production system, embedded in broader socio-ecological and non-capitalist contexts. ■ be equipped to analyze the interaction between labor and nature across different sectors and geographies, informed about the different functions that extraction, production, reproduction, consumption, and waste handling serve within the capitalist economy. ■ explore the gendered, racialized, and class-based organization of labor and its implications for sustainability and social equity. ■ apply interdisciplinary approaches, including (eco-)feminism, social reproduction theory, ecological economics, and (post-)development perspectives to real-world case studies.

- have developed critical perspectives on the metabolic relationships between society and nature under capitalism and are able to assess arguments and possibilities regarding their regulation and transformation.

Examination achievement

Oral presentations (30%)
Individual essay (70%)

Course achievement

None

Teaching method

Lectures, guided reading, discussion, group work, interactive learning, and short presentations

Literature

A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form.

- Pineault, Éric (2023). A Social Ecology of Capital: Circulation, Accumulation, and the Metabolic Rift. Montreal: McGill-Queen's University Press.
- Sultana, Farhana (2022). The Unbearable Heaviness of Climate Coloniality. Political Geography, 99, 102638.
- Salleh, Ariel (2000). The Meta-industrial Class and Why We Need It. Democracy & Nature, 6(1), 27–36.
- Biesecker, Adelheid, & Hofmeister, Sabine (2010). Focus: (Re)productivity. Sustainable relations both between society and nature and between the genders. Ecological Economics, 69(8), 1703–1711.
- Fischer-Kowalski, Marina, & Haberl, Helmut (1993). Metabolism and Colonization: Modes of Production and the Physical Exchange between Societies and Nature. Innovation: The European Journal of Social Science Research, 6(4), 415–442.
- Luxemburg, Rosa (1969). Die Akkumulation des Kapitals (3rd ed.). Frankfurt: Verlag Neue Kritik.
- Marx, Karl, & Engels, Friedrich (1968). Die sogenannte ursprüngliche Akkumulation. In MEW 23: Karl Marx - Friedrich Engels - Werke. Berlin: Dietz Verlag.

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Name of module	Number of module
At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms	10LE07MO-M.96004
course	
At Work with Nature: Analyzing & Regulating Society-Nature Metabolisms	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.96004

ECTS-Points	5.0
Workload	150 h
Attendance	50 h
Independent study	100 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	30

Contents

This seminar examines the intersections of labor, capitalism, and society-nature relations, offering students an in-depth look at how capitalism, as a dependent mode of production and a layered system of valorization, operates in its social and ecological context.
The course focuses on five interconnected sites of labor where society and nature are metabolically linked: extraction, production, social reproduction, consumption, and waste handling. These sites span activities at the center and at the margins of capitalism, illuminating the often-invisible relationships between labor, social inequalities, and environmental impacts.

Through an analysis of different sites, students will explore how each form of work and life is differently socially organized, exploited, and embedded in a common gendered, racialized, and otherwise socially stratified societal formation under capitalism.

By combining theoretical foundations, e. g. from critical political economy and social theory, with a case-study approach, students will investigate the material and social practices that sustain and reproduce capitalism. Students will learn how societal and ecological transformations are deeply entangled with capitalist dynamics and how these dynamics manifest in everyday life and work.

The case studies to be investigated by student groups will be accompanied by an introduction to foundational concepts in political economy and complementary perspectives. We will engage with classical Marxian analyses, contemporary political economy approaches (e.g., Moore 2015), and (eco-)feminist and decolonial critiques of labor and nature (e.g., Salleh 2000, Sultana 2022). Additional perspectives from ecological economics and the study of social relations to nature will enrich the discussion (e.g., Fischer- Kowalski and Haberl 1993, Becker and Jahn 2006, Biesecker and Hofmeister 2010). We also explore the conditions under which society-nature-metabolisms might be redirected toward social-ecological transformation.

To support students' research and their academic development, the course includes method-focused trainings on the writing process as well as an open-topic session, and a closing reflection. This integrated approach equips students with both the theoretical tools and practical skills to critically analyze society-nature metabo-

lisms and contribute to current and pressing debates in political economy and transformation research regarding their regulation and transformation.

Qualification

By the end of this course, students will:

- understand capitalism as a dependent production system, embedded in broader socio-ecological and non-capitalist contexts.
- be equipped to analyze the interaction between labor and nature across different sectors and geographies, informed about the different functions that extraction, production, reproduction, consumption, and waste handling serve within the capitalist economy.
- explore the gendered, racialized, and class-based organization of labor and its implications for sustainability and social equity.
- apply interdisciplinary approaches, including (eco-)feminism, social reproduction theory, ecological economics, and (post-)development perspectives to real-world case studies.
- have developed critical perspectives on the metabolic relationships between society and nature under capitalism and are able to assess arguments and possibilities regarding their regulation and transformation.

Examination achievement

Oral presentations (30%), Individual essay (70%)

Course achievement

None

Literature

A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form.

- Pineault, Éric (2023). A Social Ecology of Capital: Circulation, Accumulation, and the Metabolic Rift. Montreal: McGill-Queen's University Press.
- Sultana, Farhana (2022). The Unbearable Heaviness of Climate Coloniality. Political Geography, 99, 102638.
- Salleh, Ariel (2000). The Meta-industrial Class and Why We Need It. Democracy & Nature, 6(1), 27–36.
- Biesecker, Adelheid, & Hofmeister, Sabine (2010). Focus: (Re)productivity. Sustainable relations both between society and nature and between the genders. Ecological Economics, 69(8), 1703–1711.
- Fischer-Kowalski, Marina, & Haberl, Helmut (1993). Metabolism and Colonization: Modes of Production and the Physical Exchange between Societies and Nature. Innovation: The European Journal of Social Science Research, 6(4), 415–442.
- Luxemburg, Rosa (1969). Die Akkumulation des Kapitals (3rd ed.). Frankfurt: Verlag Neue Kritik.
- Marx, Karl, & Engels, Friedrich (1968). Die sogenannte ursprüngliche Akkumulation. In MEW 23: Karl Marx - Friedrich Engels - Werke. Berlin: Dietz Verlag.

Compulsory requirement

None

Teaching method

Lectures, guided reading, discussion, group work, interactive learning, and short presentations

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Name of module	Number of module
Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures	10LE07MO-M.96002
Responsible	
Prof. Dr. Tanja Mölders	
Faculty	
Faculty of Environment and Natural Resources	

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures	andere (z.B. Kurse, Tutorien)	Compul-sory	5.0	4.0	150 h

Contents
In this elective module, we will explore the interconnectedness of complex and entangled power relations with the escalating ecological crisis to engage with the question raised above. Through reading key literature, we will trace the origins of intersectionality as well as current feminist debates revolving around it and identify key reasons for applying the concept to socio-ecological issues. To complete the picture, we will also delve into selected feminist perspectives on society-nature relations associated with an intersectional approach (Ecofeminisms, Feminist Political Ecologies, and Posthuman Feminisms). By mapping out which social categories these perspectives focus on and how they conceptualize the interplay between each of them in relation to ecological issues, we will reconstruct their theoretical potentials to critique current conditions and envision sustainable futures. Engaging with this plurality of approaches will enable us to better understand how intersectional ways of thinking can then be applied.
Qualification
In this module participants learn to: ■ engage with conceptual debates around intersectionality; ■ develop an understanding of the interconnectedness of societal power relations and ecological crises; ■ identify and discuss the strengths and blind spots of socio-ecological research approaches; ■ critically reflect on their personal and theoretical positionality.

Examination achievement
Type of examination (Final Grade Composition): PL Oral presentations (30%) PL Individual essay (70%)
Teaching method
Lectures, guided reading, discussion sessions with group work and short presentations
Literature
Core readings A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form. ■ Crenshaw, Kimberle (1989): Demarginalizing the Intersection of Race and Sex. A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. In University of Chicago Legal Forum (1), Article 8, pp. 139-167. Available online at https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8/. ■ Bilge, Sirma (2013): Intersectionality Undone. In Du Bois Rev. 10 (2), pp. 405–424. DOI: 10.1017/S1742058X13000283. ■ Kaijser, Anna; Kronsell, Annica (2014): Climate change through the lens of intersectionality. In Environmental Politics 23 (3), pp. 417–433. DOI: 10.1080/09644016.2013.835203 ■ Mikulewicz, Michael; Caretta, Martina Angela; Sultana, Farhana; J. W. Crawford, Neil (2023): Intersectionality & Climate Justice: A call for synergy in climate change scholarship. In: Environmental Politics, S. 1–12. DOI: 10.1080/09644016.2023.2172869

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Name of module	Number of module
Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures	10LE07MO-M.96002
course	
Rethinking Societal Relations to Nature: Intersectional Feminist Lessons for Sustainable Futures	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.96002

ECTS-Points	5.0
Workload	150 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Elective
Language	English
Group size	40

Contents

In coining the term intersectionality, Kimberlé Crenshaw (1989) gave a name to the long-standing tradition of Black feminist thought, which understands distinct systems of oppression such as patriarchy, racism, classism, colonialism, homophobia, and ableism as intertwined. This idea is now increasingly being taken up in socio-ecological research to provide a more nuanced understanding of societal relations to nature. But what makes socio-ecological conceptualizations and analysis truly intersectional?

In this elective module, we will explore the interconnectedness of complex and entangled power relations with the escalating ecological crisis to engage with the question raised above. Through reading key literature, we will trace the origins of intersectionality as well as current feminist debates revolving around it and identify key reasons for applying the concept to socio-ecological issues. To complete the picture, we will also delve into selected feminist perspectives on society-nature relations associated with an intersectional approach (Ecofeminisms, Feminist Political Ecologies, and Posthuman Feminisms). By mapping out which social categories these perspectives focus on and how they conceptualize the interplay between each of them in relation to ecological issues, we will reconstruct their theoretical potentials to critique current conditions and envision sustainable futures. Engaging with this plurality of approaches will enable us to better understand how intersectional ways of thinking can then be applied.

In addition to short introductory lectures, the elective module will offer plenty of room for methodologically guided discussions of the core readings and critical reflections of one's own positionality as a student/researcher. At the end of the module, participants will submit the results of their personal learning process in the form of an individual essay.

Examination achievement

Type of examination (Final Grade Composition):

PL Oral presentations (30%)
PL Individual essay (70%)

Course achievement

Literature
Core readings A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form. ■ Crenshaw, Kimberle (1989): Demarginalizing the Intersection of Race and Sex. A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics. In University of Chicago Legal Forum (1), Article 8, pp. 139-167. Available online at https://chicagounbound.uchicago.edu/uclf/vol1989/iss1/8/. ■ Bilge, Sirma (2013): Intersectionality Undone. In Du Bois Rev. 10 (2), pp. 405–424. DOI: 10.1017/S1742058X13000283. ■ Kaijser, Anna; Kronsell, Annica (2014): Climate change through the lens of intersectionality. In Environmental Politics 23 (3), pp. 417–433. DOI: 10.1080/09644016.2013.835203 ■ Mikulewicz, Michael; Caretta, Martina Angela; Sultana, Farhana; J. W. Crawford, Neil (2023): Intersectionality & Climate Justice: A call for synergy in climate change scholarship. In: Environmental Politics, S. 1–12. DOI: 10.1080/09644016.2023.2172869
Compulsory requirement
None
Teaching method
Lectures, guided reading, discussion sessions with group work and short presentations

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Name of module	Number of module
Leadership & Organizational Learning in the Green Sector	10LE07MO-M.96001
Responsible	
Prof. Dr. Heiner Schanz	
Faculty	
Faculty of Environment and Natural Resources	

ECTS-Points	5.0
Workload	150 h
Hours of week	4
Attendance	tbc
Independent study	tbc
Recommended semester	2
Duration	3 weeks
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
None

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
We DO Change: Reshaping Organizations for Global Impact	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
This advanced seminar applies a multifocal lens of various theoretical approaches to understand organizations as complex social systems that follow their own decision-making premises while remaining susceptible to purposeful influence. The organizational capability to collectively learn, adapt to change and drive transformation as an essential survival factor will stand at the center of our seminar. The course integrates perspectives from organizational theory, social entrepreneurship and environmental governance to demonstrate how organizational transformation can serve as a catalyst for broader societal change. By developing a deeper understanding of leadership as a systemic phenomenon, students will learn how different forms of organizations - from traditional businesses to social enterprises - can develop and maintain agency in addressing contemporary challenges while managing their own transformation processes. This understanding is crucial for any kind of organization to become an effective agent of positive change in an increasingly complex and interconnected world.
Qualification
In this module students learn to: ■ Analyze the role of organizations as agents of change in Global Transformation ■ Understand and critically assess different approaches to organizational transformation and leadership through a multitude of case examples ■ Experience a variety of transformative methodologies for individual, group and organization development

- Apply various transformation models, va. Theory U, to practical organizational challenges
- Review your own experiences in/with organizations to evaluate the role of leadership in organizational and societal transformation processes
- Critically examine the intersection of organizational development, transformational leadership and environmental governance

Examination achievement

Group Assignment (60%), Written individual essay (40%),

Course achievement

None

Teaching method

Socratic Lecture, Group Dialogue, Various Individual Reflection Methodologies

Literature

A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form.

1. Scharmer, C. O. (2016). Theory U: Leading from the Future as It Emerges. Berrett-Koehler Publishers.
2. Bojer, M.; Roehl, H.; Knuth, M.; Magner, C. (2008). Mapping Dialogue. Essential Tools for Social Change.
3. Evans, L. S., et al. (2015). Understanding leadership in the environmental sciences. Ecology and Society, 20(1).

Additional readings will be made available online in electronic form at the start of the course.

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Name of module	Number of module
Leadership & Organizational Learning in the Green Sector	10LE07MO-M.96001
course	
We DO Change: Reshaping Organizations for Global Impact	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.96001

ECTS-Points	5.0
Workload	150 h
Attendance	tbc
Independent study	tbc
Hours of week	4.0
Recommended semester	2
Frequency	takes place each summer term
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	30

Contents
Contemporary society faces unprecedented challenges at the intersection of environmental crisis, political instability, and rapid technological change. Organizations of all types - from corporations to public institutions and civil society actors - find themselves at a critical juncture where traditional approaches to management and leadership appear increasingly inadequate. This decade of transformation and disruptive change demands new perspectives on how organizations can effectively respond to and shape societal change, while simultaneously managing their own internal transformations. This advanced seminar applies a multifocal lens of various theoretical approaches to understand organizations as complex social systems that follow their own decision-making premises while remaining susceptible to purposeful influence. The organizational capability to collectively learn, adapt to change and drive transformation as an essential survival factor will stand at the center of our seminar. Through this perspective, we critically examine the concepts of organizational learning, change management and the respective leadership roles, retrieving them from conventional wisdom and myths to understand their actual function and potential for sustainable transformation. Focusing on transformative leadership, the course challenges students to reconsider leadership not as a personal attribute or position, but as a systemic phenomenon that emerges in the collective interaction between individuals, organizations, and their environments. The seminar offers a range of methodologies for the students to experience themselves as leaders in complex deliberation and decision-making processes. Drawing from systems theory and contemporary transformation models, the course focuses on the application of various transformation methodologies, such as Scenario Planning, Dialogue Methods and a range of group deliberation methods such as The World Café or the Open Space Technology. Conceptual Frameworks such as the Theory U guide us in our understanding of how organizations and groups function as social systems and how they can be effectively developed collectively in dedicated change processes. Special attention is given to understanding leadership's role in transformation, examining both its mythological aspects and practical applications in driving organizational and societal change. Students will explore how leadership manifests in different organizational contexts and how it can be leveraged to facilitate meaningful transformation. The course integrates perspectives from organizational theory, social entrepreneurship and environmental governance to demonstrate how organizational transformation can serve as a catalyst for broader societal change. By developing a deeper understanding of leadership as a systemic phenomenon, students will learn how different forms of organizations - from traditional businesses to social enterprises - can develop and

maintain agency in addressing contemporary challenges while managing their own transformation processes. This understanding is crucial for any kind of organization to become an effective agent of positive change in an increasingly complex and interconnected world.

About the Instructors
Prof. Dr. Heiko Roehl has been dedicated to Organizational Transformation for over three decades. He studied Psychology, Business Administration, and Sociology in Berlin, Bologna/Italy, and Bielefeld, earning a Diploma/MSc. in Psychology and a PhD in Sociology. Throughout his career, he has contributed to numerous international large-scale transformation programs. Starting in 1995, he served as a project lead at the Future Research Think Tank of Daimler-Benz AG in Berlin and Palo Alto/USA, conducting research and consulting on the future of Organized Value Creation. Between 2001 and 2006, he held the position of Head of Strategy at the Nelson Mandela Foundation in Johannesburg, seconded by the Federal Ministry for Economic Cooperation (BMZ) to South Africa. Subsequently, he assumed leadership of the Corporate Organization and Development Department at the German International Cooperation (GIZ) until 2012. From 2013, he established and directed the Global Leadership Academy of the Federal Ministry for Economic Cooperation. In 2015, he founded Kessel & Kessel GmbH in Berlin, a Consulting Agency focusing on high-level systemic governance development work in various sectors. Heiko Roehl is an Author of numerous publications on Organizational Transformation and Change Management, and he is a member of various advisory boards.
Björn Adam is a Senior Partner at Kessel & Kessel GmbH and social entrepreneur. As founder of "beWirken," one of Germany's leading organizations in educational transformation, he combines his expertise in agile transformation with practical innovation in social systems. With his multi-entrepreneurial background, he bridges organizational development methods with psychological dynamics of people and teams, advising clients from international corporations to start-ups.

Qualification

In this module students learn to:
- Analyze the role of organizations as agents of change in Global Transformation
- Understand and critically assess different approaches to organizational transformation and leadership through a multitude of case examples
- Experience a variety of transformative methodologies for individual, group and organization development
- Apply various transformation models, va. Theory U, to practical organizational challenges
- Review your own experiences in/with organizations to evaluate the role of leadership in organizational and societal transformation processes
- Critically examine the intersection of organizational development, transformational leadership and environmental governance

Examination achievement

Group Assignment (60%), Written individual essay (40%)

Course achievement

None

Literature

A list of relevant texts will be made available at the start of the course; obligatory readings (and part of the voluntary readings) will be made available online in electronic form.
- Scharmer, C. O. (2016). Theory U: Leading from the Future as It Emerges. Berrett-Koehler Publishers.
- Bojer, M.; Roehl, H.; Knuth, M.; Magner, C. (2008). Mapping Dialogue. Essential Tools for Social Change.
- Evans, L. S., et al. (2015). Understanding leadership in the environmental sciences. Ecology and Society, 20(1).

Additional readings will be made available online in electronic form at the start of the course.

Compulsory requirement

None

Teaching method
Socratic Lecture, Group Dialogue, Various Individual Reflection Methodologies

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Name of module	Number of module
Inventory and Evaluation in Nature Conservation	10LE07MO-M.13032
Responsible	
Prof. Dr. Albert Reif	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg Institute of Forest Sciences, Professorship in Applied Vegetation Ecology-VB	

ECTS-Points	5.0
Workload	150 h
Hours of week	4
Attendance	80 h
Independent study	70 h
Recommended semester	2
Duration	3 Wochen
Compulsory/Elective (C/E)	Core elective
Frequency	takes place once or irregularly

Compulsory requirement
None
Recommended requirement
Basic knowledge in statistics, pedology, meteorology, vegetation science, plant ecology, botany, forestry

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Inventory and Evaluation in Nature Conservation	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
During the first week, an overview of landscape, landscape history and habitats of different ecosystems of Transylvania will be provided. During the second week, local studies in the mountain village of Gheţari (1200 m a.s.l.) will be made (excursions, group work). The location for the course will be in Romania. Transport by Minibuses. The module consists of a 2-weeks course phase: lectures and field course in Romania (29.7.-09.8.2025), and a third week with own studies. The staff will teach the theoretical background and the students will apply problem-based team projects to real-field situations starting with the design of data collection and analysis ending with discussion and evaluation.
Qualification
After passing the course, the participants will: ■ Have increased knowledge about Taxonomy, mainly of plants, medicinal plants, habitats; ■ Have increased knowledge of Romanian History and architecture; ■ have basic knowledge about methods in inventory of forests and grassland;

- be able to explain the relationship between soil, climate, site conditions, vegetation and land-use of the grassland and forest types to be visited;
- be able to monitor different forest and grassland types according to selected parameters, e.g., specie composition, structure;
- be capable to apply - with some assistance - knowledge about the above topics within a defined problembased project/presentation, including: Planning, Data Collecting and Data Analysis, Reporting.

Examination achievement
Presentation (25%), group work 60%, practical performance (15%)
Course achievement
None
Teaching method
Lectures on underlying theoretical aspects and tools of analyses are combined with excursions, field exercises, individual and group works. A project work will be performed, including planning, data collection and analysis, written and oral presentation.
Literature
Will be provided in the course.
Recommendation
Relevance/use of the module Learning and practising how to analyse the relations between site – vegetation – land-use and grassland management with emphasis on grassland evaluation and importance of preserving the cultural landscapes and their biodiversity.

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Name of module	Number of module
Inventory and Evaluation in Nature Conservation	10LE07MO-M.13032
course	
Inventory and Evaluation in Nature Conservation	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07V-M.13032

ECTS-Points	5.0
Workload	150 h
Attendance	80 h
Independent study	70 h
Hours of week	4.0
Recommended semester	2
Frequency	takes place once or irregularly
Compulsory/Elective (C/E)	Core elective
Language	english
Group size	7

Contents

During the first week, an overview of landscape, landscape history and habitats of different ecosystems of Transylvania will be provided. During the second week, local studies in the mountain village of Gheţari (1200 m a.s.l.) will be made (excursions, group work). The location for the course will be in Romania. Transport by Minibuses.

The module consists of a 2-weeks course phase: lectures and field course in Romania (29.7.-09.8.2025), and a third week with own studies.

The staff will teach the theoretical background and the students will apply problem-based team projects to real-field situations starting with the design of data collection and analysis ending with discussion and evaluation.

Due to our long lasting cooperation and cooperation, there will join us also participants from Romania, from the University of Agricultural Sciences in Cluj-Napoca. Accordingly, one of the main objectives of this module is also multicultural cooperation between higher education institutions; development of innovative practises in education and training and their transfer from one participating country to the other.

Additional benefits
This didactic approach simultaneously develops both problem solving strategies and disciplinary knowledge bases and skills by placing students in the active role of problem solvers confronted with a realistic problem that mirrors real-world problems of actual grassland and forest situation.
The individual benefit in participation in this course for students and teaching staff will be the introduction of new ways in thinking about the problem domain through this intense international collaboration, new transnational cross-cultural dialogues and sharing of experience and best practice profound knowledge about inventory and monitoring.

Relevance/use of the module
Learning and practising how to analyse the relations between site – vegetation – land-use and grassland management with emphasis on grassland evaluation and importance of preserving the cultural landscapes and their biodiversity.

Qualification
After passing the course, the participants will: ■ Have increased knowledge about Taxonomy, mainly of plants, medicinal plants, habitats; ■ Have increased knowledge of Romanian History and architecture; ■ have basic knowledge about methods in inventory of forests and grassland; ■ be able to explain the relationship between soil, climate, site conditions, vegetation and land-use of the grassland and forest types to be visited; ■ be able to monitor different forest and grassland types according to selected parameters, e.g., species composition, structure; ■ be capable to apply - with some assistance - knowledge about the above topics within a defined pro-blembased project/presentation, including: Planning, Data Collecting and Data Analysis, Reporting.
Examination achievement
Presentation (25%), group work 60%, practical performance (15%)
Course achievement
None
Literature
Will be provided during the course.
Compulsory requirement
None
Recommended requirement
Basic knowledge in statistics, pedology, meteorology, vegetation science, plant ecology, botany, forestry
Teaching method
Lectures on underlying theoretical aspects and tools of analyses are combined with excursions, field exercises, individual and group works. A project work will be performed, including planning, data collection and analysis, written and oral presentation.
Recommendation
Preparatory meeting for all participants from Freiburg will be on Tuesday, 5.5.2020, 17 h, in the Library Room of the Chair of Forest Growth and Dendrology, Tennenbacher Str. 4, floor 2, Freiburg. The total costs for each student from Freiburg will be estimated to be 500 € (preliminary, to be checked!) which includes transport, Bed + Breakfast, and dinner. A separate registration is required. Application: albert.reif@waldbau.uni-freiburg.de Please note that ERASMUS-students cannot participate, because they are already involved in such kind of a program.

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Name of module	Number of module
Analyse forstlicher Arbeitsssysteme	10LE07MO-M.64086
Responsible	
Prof. Dr. Thomas Frank Purfürst	
Faculty	
Faculty of Environment and Natural Resources Albert-Ludwigs-Universität Freiburg	

ECTS-Points	5.0
Workload	150 h
Hours of week	4
Recommended semester	3
Duration	3 Wochen Block
Compulsory/Elective (C/E)	Core elective
Frequency	takes place each summer term

Compulsory requirement
keine

Assigned Courses					
Name	Type	C/E	ECTS	HoW	Workload
Analyse forstlicher Arbeitssysteme	andere (z.B. Kurse, Tutorien)	Core elective	5.0	4.0	150 h

Contents
■ In dem Modul werden Verfahren zur Erfassung und Analyse von Arbeitssystemen in Forstbetrieben mit ihren Anwendungsbereichen vorgestellt und bewertet. Ausgewählte Verfahren werden in praktischen Fallbeispielen angewendet. ■ In der ersten Woche werden im Hörsaal die theoretischen Grundlagen zu Arbeitsstudien und dem methodischen Vorgehen vermittelt. Ergänzend wird eine vergleichende Analyse möglicher Arten von Arbeitsstudien durchgeführt. ■ In der zweiten Woche erfolgt die praktische Durchführung von Arbeitsstudien, insbesondere von Arbeitszeitstudien bei der realen Ausführung von Holzernteprozessen im Wald. Es folgen die Aufbereitung und Auswertung der erhobenen Datensätze sowie deren Interpretation. Neben Zeitbedarf, Produktivität und Kosten schließt die Analyse des Arbeitssystems auch eine kritische Bewertung der Ergonomie und der Umweltwirkungen ein. Die dafür vorgesehene Arbeit in Kleingruppen findet am Kuratorium für Waldarbeit und Forsttechnik (KWF) in Groß-Umstadt und in umliegenden Wäldern statt. ■ Inhalt der dritten Woche (in Freiburg) ist die weitere Datenauswertung und die Präsentation der Ergebnisse. ■ Für vier Übernachtungen mit Vollpension in einer Jugendherberge ist eine Kostenbeteiligung in Höhe von ca. 60,- Euro vorgesehen.

Qualification
Die Studierenden ■ sind in der Lage ein Arbeitssystem ganzheitlich zu bewerten. ■ haben die erforderlichen Kenntnisse, einen Arbeitsversuch zu planen, entsprechende Arbeitsstudien durchzuführen und aus den erhobenen Daten aussagekräftige Ergebnisse abzuleiten und diese überzeugend in schriftlicher und mündlicher Form zu kommunizieren
Examination achievement
Schriftliche Ausarbeitung (50%), Klausur (50%)
Course achievement
Keine
Recommendation
Das Modul ist wegen umfangreicher Datenerhebungen im weglosen Gelände für schwangere Studierende nicht geeignet.

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Name of module	Number of module
Analyse forstlicher Arbeitssysteme	10LE07MO-M.64086
course	
Analyse forstlicher Arbeitssysteme	
Event type	Number
andere (z.B. Kurse, Tutorien)	10LE07Ü-M.64086

ECTS-Points	5.0
Workload	150 h
Attendance	60 h
Independent study	90 h
Hours of week	4.0
Recommended semester	3
Frequency	takes place each winter term
Compulsory/Elective (C/E)	Core elective
Language	german

Contents
Es werden Verfahren zur Erfassung und Analyse von Arbeitssystemen in Forstbetrieben mit ihren Anwendungsbereichen vorgestellt und bewertet. Ausgewählte Verfahren werden in praktischen Fallbeispielen angewendet. In der ersten Woche werden die theoretischen Grundlagen zu Arbeitsstudien und dem methodischen Vorgehen vermittelt. Es erfolgt die praktische Durchführung von Arbeitsstudien, insbesondere von Arbeitszeitstudien bei der realen Ausführung von Holzernteprozessen im Wald. Ergänzend wird eine vergleichende Analyse möglicher Arten von Arbeitsstudien durchgeführt. In der zweiten Woche findet eine mehrtägige Exkursion (3-4 Tage) zum KWF nach Groß-Umstadt statt! In der zweiten und dritten Woche erfolgt die Analyse und die Bewertung von digitalen Produktionsdaten der Forst-Holz-Kette z.B. Harvesterdaten und deren Darstellung im Produktionsprozess. Es folgen die Aufbereitung und Auswertung der erhobenen Datensätze sowie deren Interpretation. Neben Zeitbedarf, Produktivität und Kosten schließt die Analyse des Arbeitssystems auch eine kritische Bewertung der Umweltwirkungen ein. Es werden digitale Geschäftsprozesse der Forst-Holz-Kette analysiert und bewertet. Dabei werden GIS-gestützte Optimierungsansätze angewandt und eine Präsentation der Ergebnisse vorbereitet. Die dafür vorgesehene Arbeit findet in Gruppen statt. **Hinweis:** Das Modul ist wegen umfangreicher Datenerhebungen im weglosen Gelände für schwangere Studierende nicht geeignet.
Qualification
Die Studierenden ■ sind in der Lage ein Arbeitssystem ganzheitlich zu bewerten. ■ haben die erforderlichen Kenntnisse, einen Arbeitsversuch zu planen, entsprechende Arbeitsstudien durchzuführen und aus den erhobenen Daten aussagekräftige Ergebnisse abzuleiten und diese überzeugend in schriftlicher und mündlicher Form zu kommunizieren.

Examination achievement
Klausur (60 min, 50%), Bericht (50%)
Course achievement
Keine
Literature
Wird während des Kurses ausgestellt
Compulsory requirement
keine
Recommended requirement
M.Sc. Modul: Verfahrenstechnik, Holzernte, Logistik
Teaching method
Präsentation, Diskussion, Übungen, Gruppenarbeit, Exkursion, GIS-Übungen

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