



Module Manual

Master Program

Sustainable Land Management and Conservation

April 2026

gültig für immatrikulierte Studierende ab WS 2024/25

Compulsory Courses

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Module Name: 1. Biogeography and Ecosystems Analysis Module Coordinator: Prof. Dr. Ezequiel Fabiano Lecturers: Prof. Dr. Ezequiel Fabiano								
Study Programme: Master Sustainable Land Management and Conservation								
Classification in the Study Programme: Compulsory Course								
Semester: winter		Blocked Course: no						
Work Load: 150 h	Teaching Hours: 45 h (60 lessons of 45 minutes)	Credits: 5						
Distribution of Work Load (in Teaching and Learning Forms): <table><tr><td>Teaching and Learning Forms</td><td>Hours</td></tr><tr><td>Seminar/ Practical Course</td><td>45 h (60 lessons of 45 minutes)</td></tr><tr><td>Self-study incl. Practice and Exam Preparation</td><td>105 h</td></tr></table>			Teaching and Learning Forms	Hours	Seminar/ Practical Course	45 h (60 lessons of 45 minutes)	Self-study incl. Practice and Exam Preparation	105 h
Teaching and Learning Forms	Hours							
Seminar/ Practical Course	45 h (60 lessons of 45 minutes)							
Self-study incl. Practice and Exam Preparation	105 h							
Examination (acc. SPO): Written Examination (90 minutes)		Language: English						
Requirements (from other modules of the study program): none								
Learning Outcomes: Students will gain understanding of interrelationships, interactions and processes in the environment. They understand the mutability and sensitivity of ecosystems in space and time. The students have knowledge of the basics of the study of species communities, they understand the global patterns of biodiversity, dispersal and distribution of species as well as globally negative impacts of human activities on species communities, ecosystem services and land use potentials. Students possess the ability to engage in scientific discourse with regard to current problems. They acquire the ability to independently conduct scientific research, preparation, assessment, presentation, and critically engage with current issues of conservation and land use.								
Main Topics: - Advanced ecology and ecosystem research - Origin, delimitation and characteristics of the biomes and the individual faunal and floral kingdoms								
Literature // Study Materials: - Biogeography, Lomolino et al., Sinauer Associates Inc. - Alternating depending on focus topics								

Module Name: 2. Landscape Ecology and Agroecology
Module Coordinator: Prof. Dr. Christina Fischer
Lecturers: Prof. Dr. Christina Fischer, Dr. Eleonore Slabbert

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: winter

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course

45h (60 lessons of 45 minutes)

Self-study incl. Practice and

Exam Preparation

105 h

Examination (acc. SPO): Examination report
 Preliminary performance: individual presentation (20 minutes) on a current topic of landscape ecology and/ or agroecology

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

Students are able to understand landscape-ecological relationships and patterns at different spatial scales and to analyze them with the help of different landscape indices. They learn to relate the landscape ecology perspective to agroecological principles. Students have knowledge of key factors in agroecosystems and different agroecological concepts.

Participants gain experience in finding, understanding, presenting and critically discussing current scientific publications in this context. Furthermore, they are able to identify different landscape and agroecological parameters that are needed for the conversion of conventional agricultural systems into more ecological-based ones.

Main Topics:

- introduction to landscape ecology and scale
- causes of landscape patterns
- landscape metrics
- ecosystem processes in heterogeneous landscapes
- landscape dynamics in a rapidly changing world
- the need for sustainable food production systems
- the agroecological concept
- key ecological factors and resources that impact agriculture
- system-level interactions and ecological tipping points
- transitioning towards sustainable agroecosystems and sustainable food systems

Literature // Study Materials:

- Gliessman, Stephen R. (2014) Agroecology: The Ecology of Sustainable Food Systems. CRC Press ([Book chapter abstracts available online: https://www.taylorfrancis.com/books/mono/10.1201/b17881/agroecology-stephen-gliessman](https://www.taylorfrancis.com/books/mono/10.1201/b17881/agroecology-stephen-gliessman)) – copies at Hochschule library (several copies of the text book will be available at the campus library)
 - Gliessman, Stephen R. (2014) Agroecology: The Ecology of Sustainable Food Systems. CRC Press
 - Turner, Monica G. & Gardner, Robert H. (2015) Landscape Ecology in Theory and Practice: Pattern and Process. Springer
- Recent scientific publications

Module Name: 3. Applied Statistics
Module Coordinator: Prof. Dr. Friederike Paetz
Lecturers: Prof. Dr. Friederike Paetz

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: winter

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course
 Self-study incl. Practice and
 Exam Preparation

45 h (60 lessons of 45 minutes)
 105 h

Examination (acc. SPO): Examination report (Working on a concrete research question and independently analyzing a given data set using the statistical methods learned in the course. Preparation of a protocol, which is structured according to a scientific publication).

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

Students are able to evaluate data from society, nature and the environment using current methods of applied environmental statistics. Students are able to plan observational studies and experiments in such a way that hypotheses can be tested.

Students are confident in the use of data types, distributions, and measures of distribution. They are skilled in descriptive statistics, as well as basic statistical modelling methods to identify and test relationships in ecological data. They are able to visualize statistical results and translate them into practically relevant conclusions.

Furthermore, the students will be able to confidently use the freely available statistical software R.

Main Topics:

- experimental design
- introduction into the statistical software R
- correlations and associations
- linear models, multiple regressions
- introduction to multivariate methods
- visualization, interpretation of results, textual description, statistical methods and presentation of results

Literature // Study Materials:

- Crawley, Michael (2014) Statistics: An Introduction Using R. Wiley.
- Crawley, Michael (2012) The R Book. Wiley.
- Help systems of the used software

Module Name: 4. Project Planning and Implementation

Module Coordinator: Prof. Dr. Christina Fischer, Prof. Dr. Anita Kirmer, Prof. Dr. Markus Meyer, Prof. Dr. Caroline Stolter, Prof. Dr. Sabine Tischew, Prof. Dr. Ezequiel Fabiano

Lecturers: Prof. Dr. Christina Fischer, Prof. Dr. Anita Kirmer, Prof. Dr. Markus Meyer, Prof. Dr. Caroline Stolter, Prof. Dr. Sabine Tischew, Prof. Dr. Ezequiel Fabiano

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: winter

Blocked Course: no

Work Load: 300 h

Teaching Hours within: 22.5 h
(30 lessons of 45 minutes)

Credits: 10

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course
Self-study incl. Practice and
Exam Preparation

22.5 h (30 lessons of 45 minutes)

277.5 h

Examination (acc. SPO): Project

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

The students learn how to organize independently plans or projects for the conservation, the management, the development and/ or restoration of nature and landscape. The students have the ability to work in a team. On the basis of their acquired knowledge, they can work academically preparing their master thesis. The students have experience with specialized literature, know the correct methods of researching sources and quoting and are familiar with specific information systems.

Main Topics:

- Selection of a suitable project topic
- Conceptualisation of the project
- Processing of the planning, development of the project or the conception
- Documentation of the project results

Literature // Study Materials:

- Alternating depending on focus topics

Module Name: 5. Global Environmental Problems and International Nature Conservation
Module Coordinator: Prof. Dr. Alexander Schmidt
Lecturers: Prof. Dr. Alexander Schmidt, DR. Fanny Langerwisch, Dr. Karla Locher Krause

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
(60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Seminar/ Practical Course
Self-study incl. Practice and
Exam Preparation

Hours

45 h (60 lessons of 45 minutes)
105 h

Examination (acc. SPO): Written Examination (90 minutes)

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

Students will recognize the global connections and effects of climate change and anthropogenic on the landscape and are able to implement the corresponding conclusions in their own nature conservation action. On the basis of the knowledge gained about international agreements and the and basics for nature conservation work in all regions of the world, they will be able to act as international actors. The students will also be able to quantify the effects of global change on the basis of models.

Main Topics:

- Global ecological problems: climate change, landscape overuse/desertification, water balance, decline in Biodiversity
- Modeling approaches to quantify global change and adaptation mechanisms (focus on biodiversity and ecosystem services)
- Environmental policy and international conservation policy
- International conventions
- Presentation of global instruments for nature conservation (CBD, Decade of Biological Diversity, Kunming-Montreal Global Biodiversity Framework)
- Examples of implementation of conservation strategies
- Nature conservation in different regions

Literature // Study Materials:

- International treaties on nature conservation incl. comments and reports (Ramsar, Bonn, Bern etc.)
- Recent scientific publications as well as technical papers (e.g. from BMU, BfN, UN, COP, IPCC, IPBES)

Module Name: 6. Sustainable Land Management
Module Coordinator: Prof. Dr. Markus Meyer
Lecturers: Prof. Dr. Markus Meyer, Dr. Karla Locher Krause

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course

45 h (60 lessons of 45 minutes)

Self-study incl. Practice and

Exam Preparation

105 h

Examination (acc. SPO): Examination report

Language: English

Requirements (from other modules of the study program): Landscape and Agroecology, Biogeography and Ecosystems Analysis

Learning Outcomes:

This module provides students the tools for doing research on sustainable land management and for developing major strategies. Students will integrate methods to identify strategies for managing land as part of the overall social-ecological system. After successful completion of this module, students are expected to be able to:

- discuss sustainable land management challenges,
- select and apply methods from natural and social sciences to assess and govern sustainable land management,
- identify data sources and to collect data for the aforementioned tasks,
- analyze the outcome of land management holistically using multiple methods
- plan measures for sustainable land management
- elaborate on findings and to present them in presentations and publications for readers in science and practice

Main Topics:

- Introduction to major challenges in sustainable land management
- Introduction to methods in empirical social research, mainly quantitative and qualitative participatory methods, especially mixed methods approaches
- Strategies for stakeholder involvement and knowledge transfer strategies
- Frameworks and guidelines to integrate approaches from natural (e.g., module "Landscape and Agroecology") and social sciences

- Student-led project on sustainable land management challenges in teams:
 - Research design: selection of suitable methods and data
 - Method selection and application
 - Reporting for science and practice: oral and written
 - Peer-review: feedback to other groups' presentations and reports
- Excursion addressing practical examples and challenges for implementation

Literature // Study Materials:

- Biggs, Reinette; Vos, Alta de; Preiser, Rika; Clements, Hayley; Maciejewski, Kristine; Schlüter, Maja (ed.) (2022): The Routledge Handbook of Research Methods for Social-Ecological Systems. New York: Routledge.
- World Bank (2008): Sustainable land management sourcebook. Washington, DC: World Bank (Agriculture and rural development).
- <https://www.fao.org/land-water/land/sustainable-land-management/en/>
- <https://elearning.fao.org/course/view.php?id=454&lang=ar>

Module Name: 7. Advisory in (Agro-)Ecological Management
Module Coordinator: Prof. Dr. Markus Meyer
Lecturers: Manfred Fürst

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Seminar/ Practical Course
 Self-study incl. Practice and
 Exam Preparation

Hours

45 h (60 lessons of 45 minutes)
 105 h

Examination (acc. SPO): Oral Examination (30 minutes)

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

This module provides students the competence and tools for advising land users, especially farmers, on implementing land management and measures while considering the impact on biodiversity, ecosystem functions, and services

After successful completion of this module, students are expected to be able to:

- be aware of the position of a land user and a conservationist in a consultancy process.
- select choose and use the competences and tools in different contexts (heterogeneity in landscape and land management (e.g., smallholders, holdings))
- initiate and implement the advisory process
- use of best practices and pitfalls in the advisory process
- consider the requirements for advisors.
- do a peer- and self-assessment on competences, success and behavior in the consultancy process

Main Topics:

- Methods for communication and consultation of land users, especially farmers
- Acceptance of biodiversity and other ecological measures by farmers
- Identification of suitable areas in the landscape context and the ecological network
- Implementation of ecological measures across farms (cooperation)
- Economic considerations of ecological measures (costs, cost comparison, financing possibilities)
- Role plays and consulting projects for agroecological management

Literature // Study Materials:

- RS and MEAS. 2015. Managing natural resources: A SMART Skills manual. Catholic Relief Services, Baltimore, MD, and Modernizing Extension and Advisory Services project, University of Illinois at Urbana-Champaign.
- Kassam, A. (ed.) (2020): Advances in Conservation Agriculture: Volume 1: Systems and science. Burleigh Dodds Science Publishing.
- Kassam, A. (ed.) (2020): Advances in Conservation Agriculture: Volume 2: Practice and Benefits. Burleigh Dodds Science Publishing.
- Kassam, A. (ed.) (2020): Advances in Conservation Agriculture: Volume 3: Adoption and Spread. Burleigh Dodds Science Publishing.

Module Name: 8. Project Sampling and Data Processing
Module Coordinator: Prof. Dr. Christina Fischer, Prof. Dr. Anita Kirmer, Prof. Dr. Markus Meyer, Prof. Dr. Caroline Stolter, Prof. Dr. Sabine Tischew
Lecturers: Prof. Dr. Christina Fischer, Prof. Dr. Anita Kirmer, Prof. Dr. Markus Meyer, Prof. Dr. Caroline Stolter, Prof. Dr. Sabine Tischew

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: no

Work Load: 300 h

Teaching Hours within: 22.5 h
(30 lessons of 45 minutes)

Credits: 10

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course

22.5 h (30 lessons of 45 minutes)

Self-study incl. Practice and

Exam Preparation

277.5 h

Examination (acc. SPO): Project

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

The students are able to work in teams and independently scientific. They are able to apply the acquired knowledge from previous modules a to a concrete project question. They possess competences in dealing with literature, methods as well as specialized information systems.

Main Topics:

- Selection of a suitable project topic (topics are offered by the lecturers at the beginning of the respective semester)
- Conception of the project
- Implementation of the project in the field of nature conservation, sustainable land management, ecological analysis and evaluation
- Documentation and presentation
- Seminar scientific methods

Literature // Study Materials:

– Literature, spatial and non-spatial data depending on the chosen project

Module Name: 9. Specific Geoinformatics and Remote Sensing
Module Coordinator: Prof. Dr. Matthias Pietsch
Lecturers: Prof. Dr. Matthias Pietsch, Matthias Henning

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Elective Module

Semester: winter

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course
 Self-study incl. Practice and
 Exam Preparation

45 h (60 lessons of 45 minutes)
 105 h

Examination (acc. SPO): term paper

Preliminary performance: Performance record (evaluation of remote sensing data (e.g. aerial photographs, satellite images) using of different classification methods as well as GIS-technical creation and evaluation of existing technical data as well as official geobase data; Preparation of thematic maps as well as documentation of the approach and results)

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

After successful completion of the module students:

- are able to understand the basics of reference systems for global navigation by satellite (GNSS), global orientation with technical aids and instruments such as maps and satellite navigation (GPS, Glonass, Galileo)
- will be capable to develop their own workflow and approach to data management in GIS projects (data management, data quality, data storage) with the help of GIS tools and methods (e.g. multi-criteria evaluation, overlay functions)
- understand how to work with a database, conduct basic GIS analyses and handle data capturings of different sensors and technologies
- will be capable of using GIS data during whole planning processes and develop a basic understanding of existing standards and standardization initiatives (e.g. OGC, INSPIRE). Students are supposed to collect sets of data and metadata from European and worldwide resources (e.g. CORINE, GMES, NATURA 2000 sites)
- are able to acquire remote sensing data from different sources and evaluate them with different methods (e.g. indices, classification methods, ML).

Main Topics:

Students use software products for the acquisition, analysis and visualization of GIS and remote sensing data (ERDAS Imagine, ESRI products). They generate image mosaics and evaluate landscape ecological parameters. For this purpose, raster and vector data of different quality are evaluated. Possibilities of data transformation as well as data exchange between software systems from the CAD and GIS area are presented and tested. The use of geoservices as well as the mapping of the complete process workflow are part of the module.

Literature // Study Materials:

- Smith, M., Goodchild, M., Longley, P. (2018): Geospatial Analysis - A comprehensive guide to principles, techniques and software tools, 6th edition (online [Geospatial Analysis 6th Edition, 2018 - de Smith, Goodchild, Longley and Colleagues \(spatialanalysisonline.com\)](https://spatialanalysisonline.com))
- Flacke, W., Kraus, B. (2005): Working with Projections and Datum Transformations in ArcGIS, Points Verlag Norden
- Lillesand, Kiefer, Chipman (2015): Remote Sensing and Image Interpretation, Wiley
- Online resources (e.g. ESRI Virtual Campus)

Module Name: 10. Ecological Modeling
Module Coordinator: Prof. Dr. Ezequiel Fabiano
Lecturers: Prof. Dr. Ezequiel Fabiano, Ayushi Kurian

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Elective Module

Semester: winter

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course

45 h (60 lessons of 45 minutes)

Self-study incl. Practice and

Exam Preparation

105 h

Examination (acc. SPO): Examination Report

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

The course provides an overview of classic and recent ecological models. The students gain basic knowledge to understand and classify common modelling techniques in Ecology. The course includes theoretical introductions into different ecological concepts underlying the presented ecological models as well as practical parts where the models are applied to deepen the understanding. The model application can include pen-and-paper exercises (e.g., Island Biogeography) but also the software R (e.g., Measuring Biodiversity). The course equips the student with a broad understanding of current modelling techniques relevant for sustainable land management and the conservation of habitats and species and thus allows the participants to apply models in specific future projects.

Main Topics:

- Introduction to Ecological Modeling
- Metapopulation models
- Species distribution models
- Individual-based models
- Biodiversity Theories (e.g., Island Biogeography)
- Measuring Biodiversity
- Machine Learning
- Spatial Models

Literature // Study Materials:

- Magurran 2004 Measuring Biological Diversity
- Jopp, Reuter and Breckling (Eds.) – Modeling Complex Ecological Dynamics
- Grimm and Railsback 2005 - Individual-based Modeling and Ecology
- Gotelli 2008 A Primer of Ecology
- Begon and Townsend 5th Edition 2021 Ecology – from Individuals to Ecosystems

Module Name: 11. Ecological Restoration
Module Coordinator: Prof. Dr. Anita Kirmer
Lecturers: Prof. Dr. Anita Kirmer, Prof. Dr. Volker Lüderitz

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Elective Module

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course
 Self-study incl. Practice and
 Exam Preparation

45 h (60 lessons of 45 minutes)
 105 h

Examination (acc. SPO): Examination Report

Language: English

Requirements (from other modules of the study program): Biogeography and Ecosystem analysis

Learning Outcomes:

Based on presented and self-researched case studies, students understand essential scientific concepts of restoration ecology and acquire comprehensive technical and methodological competencies in the ecological restoration habitats. By evaluating international literature on selected restoration topics and independently analyzing and evaluating restoration successes in practice, they work in teams to develop solutions to problems for restoring degraded biotopes/habitats and species communities, taking into account climate change and related problems. Students learn to handle complex data sets from field trials, to evaluate and interpret them using scientific methods, and to derive management recommendations and development prognoses from the results. They are also able to research the state of knowledge on a specific topic, write concise scientific texts and apply these skills to the example of a report or scientific poster. They present their findings and represent them in discussion groups that prepare them for real-life situations in practice. In the process, students give each other appreciative feedback, learn to work cooperatively and responsibly in groups, and to present and argue complex content in a comprehensible manner.

Main Topics:

- Introduction to methodical basics for the planning and implementation of restoration measures (abiotic, biotic as well as socio-economic framework conditions).
- Presentation of main objectives and restoration measures in restoring different habitat types as well as problems in achieving the objectives and possible solutions.

- Field trips to restoration sites in cooperation with NGOs and state authorities on selected topics (e.g., biodiversity enhancement in agricultural landscapes, restoration and management of grasslands and heathlands, wild seed propagation, post-mining sites, compensation measures)
- Planning and practical implementation of habitat restoration and survey of restoration success in the field

Literature // Study Materials:

- Gann GD, McDonald T, Walder B, Aronson J, Nelson CR, Jonson J, Hallett JG, Eisenberg C, Guariguata MR, Liu J, Hua F, Echeverria C, Gonzales, EK, Shaw N, Decleer K, Dixon KW. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology S1-S46.
- Kiehl, K., Kirmer, A., Shaw, N., Tischew, S. [eds.] (2014): Guidelines for Native Seed Production and Grassland Restoration. Cambridge Scholar Publishing. ISBN 1-4438-5900-1
- Scotton, M., Kirmer, A., Krautzer, B. [eds.] (2012): Practical handbook for seed harvest and ecological restoration of species-rich grasslands. Cleup Editore, Italy. ISBN: 9788861298002 (open access)
- Van Andel, J., Aronson, J. (2012): Restoration Ecology: The New Frontier. Blackwell Publishing. DOI:10.1002/9781118223130.

Module Name: 12. Molecular Biological Methods in Nature Conservation
Module Coordinator: Prof. Dr. Wilfried Rozhon
Lecturers: Prof. Dr. Wilfried Rozhon, Dr. Jörg Geistlinger, MSc Sarah Repert,

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Elective Module

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
(60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course

45 h (60 lessons of 45 minutes)

Self-study incl. Practice and

Exam Preparation

105 h

Examination (acc. SPO): Examination Report

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

The students have knowledge about genetics, particularly population genetics, as well as molecular methods and can apply them for environmental protection.

They can isolate DNA from difficult matrices and check the concentration and quality of the isolated DNA.

The students are able to apply DNA-based methods to attribute a genus, maybe also species to a biological sample.

They know next generation sequencing (NGS) techniques and can plan and perform such experiments to study the genus/species composition, for instance in soil samples.

They can use sequences to calculate phylogenetic trees.

The students are able to study the genetic variability of populations using biochemical and molecular biological methods.

Main Topics:

- Genetics and population genetics.
- Methods in molecular biology, particularly DNA isolation, PCR, electrophoresis, Sanger sequencing, NGS, RFLP and VNTR analysis.
- Molecular phylogeny.
- Methods in molecular biology for species identification, for instance "DNA-barcoding".
- Microbiome analysis.
- Identification of individuals in a population using DNA-based methods.
- Investigation of the genetic diversity of populations.
- Genetic drift.
- Application of molecular methods for species protection.

Literature // Study Materials:

- Brown TA: Gene Cloning and DNA Analysis: An Introduction, 8th Edition, 2020. Wiley-Blackwell, ISBN 1119640784.
- Lodge J, Lund P: Gene Cloning. 2007. Taylor & Francis Ltd. ISBN 0748765344.
- Kumar A, et al.: Molecular Genetics and Genomics Tools in Biodiversity Conservation. 2023. Springer. ISBN 9811660077.
- DeWoody AJ: Molecular Approaches in Natural Resource Conservation and Management. 2010. Cambridge University Press, ISBN 0521731348.

Module Name: 13. Feeding Ecology, Wildlife and Livestock Management
Module Coordinator: Prof. Dr. Caroline Stolter
Lecturers: Prof. Dr. Caroline Stolter

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: no

Work Load: 150 h

Teaching Hours within: 45 h
 (60 lessons of 45 minutes)

Credits: 5

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Hours

Seminar/ Practical Course
 Self-study incl. Practice and
 Exam Preparation

45 h (60 lessons of 45 minutes)
 105 h

Examination (acc. SPO): Written Examination (90 minutes)
 Preliminary performance: presentation

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

Students will be able to evaluate the sustainability of land use by wildlife and livestock in different ecosystems. In addition to gaining knowledge of animal-plant interactions, they will also gain knowledge of managing livestock and wild herbivores. Students will be able to assess the needs of animals and take appropriate actions to improve or maintain the conditions of ecosystems and rangelands. Students possess the ability to engage in scientific discourse with regard to current problems. They acquire the ability to independently conduct scientific research, preparation, assessment, presentation, and critically engage with current issues of land use.

Main Topics:

- rangeland and veld management,
- global livestock production systems,
- livestock and climate change
- feeding ecology and nutrition of ruminants and wild herbivores

Literature // Study Materials:

- Rangeland systems, Briske (Ed.), Springer,
- Game ranch management, Bothma (Ed.), Van Schaik,
- Veld management: Principles and practice, van Outshoorn, Briza,
- Veld Management in South Africa, Tainton (Ed.), KZN Press,
- Integrative wildlife nutrition, Barboza et al. (Eds.), Springer
- Alternating depending on focus topics

Module Name: 14. Master's Thesis

Module Coordinator: All professors of the study area nature conservation

Study Programme: Master Sustainable Land Management and Conservation

Classification in the Study Programme: Compulsory Course

Semester: summer

Blocked Course: yes

Work Load: 750 h

Teaching Hours within: none

Credits: 25

Distribution of Work Load (in Teaching and Learning Forms):

Teaching and Learning Forms

Self-study

Hours

750 h

Examination (acc. SPO): Master's Thesis

Language: English

Requirements (from other modules of the study program): none

Learning Outcomes:

The students are able to work independently on a subject-related problem with a scientific claim within a given time of 20 weeks, to apply suitable methods and scientific findings, to overview the subject-related contexts and to present the findings convincingly, clearly, in appropriate language and in a clear form.

Main Topics:

- Selection of a suitable topic.
- Independent performance of all necessary work and related extensive research of sources
- Precise documentation of the methodology
- Documentation and discussion of the results in the sense of the preparation of an application-oriented scientific thesis.
- Thesis under exact application of suitable methods to the result protection
- Derivation of recommendations for action and conclusions

Literature // Study Materials:

- Topic-dependent specifications, guidelines and instructions for writing the Master's thesis are provided by the supervisors.

Module Name: 15. Master Colloquium Module Coordinator: All professors of the study area nature conservation						
Study Programme: Master Sustainable Land Management and Conservation						
Classification in the Study Programme: Compulsory Course						
Semester: summer		Blocked Course: yes				
Work Load: 150 h	Teaching Hours within: none	Credits: 5				
Distribution of Work Load (in Teaching and Learning Forms): <table><tr><td>Teaching and Learning Forms</td><td>Hours</td></tr><tr><td>Self-study</td><td>150 h</td></tr></table>			Teaching and Learning Forms	Hours	Self-study	150 h
Teaching and Learning Forms	Hours					
Self-study	150 h					
Examination (acc. SPO): colloquium with presentation		Language: English				
Requirements (from other modules of the study program): none						
Learning Outcomes: In the colloquium for the Master's thesis, students are able to present scientific findings and their and their own results in lecture form, supported by modern means, and present them convincingly in a scientific dispute in terms of content and method. convincingly in a scientific discourse.						
Main Topics: ▪ Defense of the thesis within the framework of a special colloquium in front of a multi-member examination committee and the university public ▪ Discussion of the results and classification in the subject areas						
Literature // Study Materials: ▪ Topic-dependent specifications						