

## Academic offer at BOKU-University of Natural Resources and Life Sciences, Vienna

### M2 of "Agriculture, Climate Change and Transitions (ACT)" Masters Program

#### Course list (Overview)

Compulsory Courses				
Topic	Name	Number	Lecturer	ECTS
	Interdisciplinary Seminar	To be established	Formayer, Eitzinger, Wurzinger,...	2
Meteo and climate	Interfacing climate and climate impact models	To be established	Formayer	2
	Crop growth models in agriculture	814004	Eitzinger	1
	Climate Change scenarios and regional impacts	814305	Formayer	3
Development	Applied development research I	169302	Hauser, Gratzer, Khalil, Loiskandl, Probst, Wurzinger	3
	Negotiating Change: Simulating an international conference for sustainable development	169306	Probst, Gruber	3
Agriculture	Animal husbandry in tropical and subtropical regions	932324	Wurzinger	3
	Crop production in the tropics and subtropics	951332	Bodner, Manschadi	4
<b>SUM</b>				<b>21</b>

The students can choose one of two **specialisation tracks** that consist of 9 ECTS. 3 ECTS are compulsory for each track, the remaining 6 ECTS can be chosen from a course catalogue and should be relevant for the topic of the master thesis.

Specialisation Track I			
Name	Number	Lecturer	ECTS
Genetics of diversity	932312	Mészáros	3
Optional courses chosen from course catalogue, corresponding to master thesis topic			6
<b>SUM</b>			<b>9</b>

Specialisation Track II			
Name	Number	Lecturer	ECTS
Ecological plant protection	953324	Koschier, Wegensteiner	3
Optional courses chosen from course catalogue, corresponding to master thesis topic			6
<b>SUM</b>			<b>9</b>

30 ECTS + Master thesis (30 ECTS) = 60 ECTS

## Course list (Details)

### Compulsory Courses

Course title	<b>Interdisciplinary seminar</b>
Course number	To be established
Lecturer	Formayer, Eitzinger, Wurzinger,...
ECTS	2
Term	Winter semester
Course description	The course is based on the know-how of an interdisciplinary team of teacher. In a mix of key note lectures, literature reviews, investigations and presentations, the students learn to work on complex problems with an interdisciplinary approach. Topics are concrete research questions in the field of climate change impact on Agriculture in different regions of the world.

Course title	<b>Interfacing climate and climate impact models</b>
Course number	To be established
Lecturer	Formayer
ECTS	2
Term	Winter semester
Course description	The course gives a comprehensive understanding of the skills and limitations of regional climate scenarios. It gives an overview of statistical methods to bias correct and localize climate scenarios using observational data. Tools for handling typical data formats like NetCDF are introduced. The preparation of meteorological input data from climate scenario for different impact models is exercised in specific case studies

Course title	<b>Crop growth models in agriculture</b>
Course number	814004
Lecturer	Josef Eitzinger
ECTS	2 (derzeit noch 1)
Term	Winter semester
Course description	<p>The course gives an overview of potential applications of plant growing models and the necessary information needed to apply the models. This include:</p> <ul style="list-style-type: none"> <li>• input data – soil and plant parameters, meteorological data, data collection and quality control</li> <li>• critical discussion of the algorithm used in models of the soil – plant-atmosphere system</li> <li>• model application including calibration and evaluation</li> </ul> <p>The students should understand the principal processes implemented in plant growing models. They learn to prepare the necessary input data and do run the model on a PC/Laptop and to critically interpret the results.</p>

Course title	<b>Climate Change scenarios and regional impacts</b>
Course number	814305
Lecturer	Herbert Formayer

ECTS	3
Term	Summer semester (till 2016)
Course description	<p>This lecture focuses on the scientific basis of the climate system, the anthropogenic induced climate change, climate modelling, the regionalization of climate change scenarios and interactions between climate and climate change research, as well as climate change adaptation and mitigation.</p> <p>Graduates of this lecture should be able to understand scientific questions in the context of anthropogenic climate change, global and regional climate modelling, as well as climate change adaptation and mitigation. The graduates should be able to discuss these topics on expert level as well as with stakeholders.</p>

Course title	<b>Applied development research I</b>
Course number	169302
Lecturer	Hauser, Gratzler, Khalil, Loiskandl, Probst, Wurzinger
ECTS	3
Term	Winter semester
Course description	<p>The course focuses on applied development research approaches contributing to reaching international development goals (poverty reduction, food security, sustainable natural resource management);</p> <p>Development research: definitions, legitimisation, quality standards (with an emphasis on national and international development goals);</p> <p>Development research approaches: research for development seen from social, economic and natural sciences, multi-disciplinary views of development;</p> <p>Working with development cooperation and communities: building alliances and win-win situations, mediating between conflicting goals, demand / supply driven research;</p>

Course title	<b>Negotiating Change: Simulating an international conference for sustainable development</b>
Course number	169.306
Lecturer	Probst, Gruber
ECTS	3
Term	Winter semester
Course description	<p>Each year, the course focuses on a global 'hot topic' in sustainable development (e.g. land grabbing). Doing self-organized research, the students relate the given topic to the historical socio-economic and agro-ecological background of a specific region (e.g. Ethiopia). Representing a region (e.g. Ethiopia) and its interests, the students develop suggestions for solutions to address the challenge (e.g. land grabbing).</p> <p>Negotiating with other regional representatives (e.g. India), the students experience complexity and communication in a "realistic" situation.</p> <p>Based on the negotiations, the students agree on a resolution for addressing the challenge (e.g. land grabbing) in a general assembly. Finally, the complex system of international interests in development is re-conceptualized drawing from the experiences of students.</p>

Course title	<b>Animal husbandry in Tropical and Subtropical Regions</b>
Course number	932.324
Lecturer	Wurzinger
ECTS	3
Term	Summer semester
Course description	The course aims to provide basic knowledge about livestock husbandry in the tropics in its climatic and social context. The interrelationships in various systems of production and ways of intervention to improve production and livelihood are studied. Students are able to identify production constraints and decide on possible intervention strategies.

Course title	<b>Crop production in the Tropics and Subtropics</b>
Course number	951332
Lecturer	Bodner, Manschadi
ECTS	4
Term	Summer semester
Course description	This course will cover the major bio-physical and socio-economic factors determining crop production and natural resource use in the tropics and subtropics. Following an introduction into climate, vegetation, and soils, the key crops grown in the subtropical and tropical regions will be presented with detailed information on their eco-physiological and agronomical requirements. The course will also address the technical, environmental, and economic aspects of irrigated cropping systems in the subtropics and the tropical agroforestry systems. Assessing the dynamics of water, carbon, nitrogen, and phosphorus and their implications for the productivity and sustainability of tropical and subtropical agro-ecosystems is another component of this course.

## Specialisation Tracks

Course title	<b>Genetics of diversity</b>
Course number	932.312
Lecturer	Mészáros
ECTS	3
Term	Winter semester
Course description	Upon successful completion of this course the students will be able summarize the factors affecting genetic diversity on the population and individual level. They will be familiar with the distinguishing features of the idealized (Hardy-Weinberg), as opposed to real-world populations. Students will be able to describe, quantify and interpret the changes in genetic diversity parameters when specific requirements for the idealized populations are violated. The students will also understand the concept of additive genetic relationships between individuals and be able to solve practical exercises using pedigrees of

	various complexity. Students will understand the concept of conservation genetics, identify the reasons for the need of conservation of genetic resources in farm animals and wildlife, and distinguish between the various levels of protection based on the endangerment status.
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Course title	<b>Ecological plant protection</b>
Course number	953324
Lecturer	Koschier, Wegensteiner
ECTS	3
Term	Winter semester
Course description	<p>Basic principles of arthropod-plant interactions.</p> <p>Principles in ecological plant protection.</p> <p>Basics in biological and microbial control and of environmental risks.</p> <p>Advantages and disadvantages in: Classical biological control, neo-classical biological control, conservation biological control; augmentative releases, inoculation and mass application methods.</p> <p>Successful examples in biological control of plant pests and diseases.</p> <p>Host resistance of plants against pests and diseases: principles and applications.</p> <p>Underlying mechanisms and practical applications of microbial antagonists against phytopathogens.</p> <p>Behavioural control of arthropod pests: theory, current and future applications.</p> <p>Physical pest control measurements.</p> <p>Managing crop pests and diseases through cultural practices.</p>