

Universität für Bodenkultur Wien

University of Natural Resources and Life Sciences, Vienna



# Curriculum

for the Master's Programme in

## Natural Resources Management and Ecological Engineering (NARMEE)

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The International Master in Natural Resources Management and Ecological Engineering (NARMEE)<sup>1</sup> is a master's programme jointly offered by the University of Natural Resources and Life Sciences, Vienna (BOKU), the Lincoln University, Canterbury, New Zealand (LU) and the Czech University of Life Sciences Prague, Czech Republic (CZU).

## § 1 QUALIFICATION PROFILE

The master's programme in *Natural Resources Management and Ecological Engineering* (NARMEE) is a joint degree programme /twinning degree programme which serves to deepen and extend students' pre- vocational academic education, building on the basis provided by a bachelor degree programme (§ 51 [2] item 5 of the Universities Act UG 2002, Federal Law Gazette BGBl I no. 81/2009). The programme fulfils the requirements of Directive 2005/36/EC on the recognition of professional qualifications, article 11, letter e.

NARMEE is a two-year master's programme in the areas of sustainable management, planning and design of natural resources, related biogeochemical cycles, landscapes and environments, ecological engineering, and business for sustainability. Building on a sound understanding of fundamental natural and socioeconomic processes and properties of natural resources, NARMEE provides manifold opportunities to specialise in thematic fields such as agro-municipal resource management, ecological engineering and risk management, nature conservation and biodiversity management, global resources and sustainability management, or human dimension and socio-economic aspects of sustainable development. NARMEE is jointly offered in English language by the Lincoln University in Canterbury, New Zealand (LU), the Czech University of Life Sciences Prague (CZU), and the University of Natural Resources and Life Sciences, Vienna (BOKU). The programme intends to qualify the graduates for an international career in the fields of resource management and ecological engineering through studies at two universities with similar profile but different focus on teaching and research. This setting intends to add a global dimension to the learning outcomes of this curriculum.

### 1a) Knowledge and personal and professional skills

After completing the programme, NARMEE graduates will qualify for the sustainable management of natural resources and environmental risks in relation to their specialisation areas by integrating technical, economic, ecological, social and cultural skills.

#### Fundamental scientific competences and methodological skills:

Graduates of the programme are qualified to

- comprehend and analyze important processes and features of natural resources (soils, water, bio-resources), biodiversity, biogeochemical cycles, and socio-economic principles of their sustainable management;
- conduct an informed selection and use of general skills and research methods such as spatial data analysis and integration, statistical analysis, mathematical modelling of natural and socio-economic processes, and methods in economics, social and cultural management;
- execute data collection, analysis and interpretation at high scientific and technical level, and communicate the results clear and concisely both in written and oral form in English language (technical reporting, scientific publication and presentation);
- develop technical and scientific projects to address relevant technical or scientific questions including hypothesis building and selection of appropriate methodologies for project execution.

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<sup>1</sup> Referred to as "NARMEE" in the following

### Managerial, planning and engineering competences:

Graduates of the programme are qualified to

- identify, define and develop solutions towards a more sustainable management of natural resources (including supply, processing, use and protection) and biodiversity in the elected thematic fields by integrating and applying natural science, technical and socio-economic knowledge, and methodological skills;
- develop concepts and planning tools for natural resource management at various spatial and temporal scales (from individual business, agro-municipal to global scale);
- apply concepts, methods, techniques and tools for assessment and management of environmental risks and protection from natural hazards with emphasis on ecological engineering approaches;
- apply concepts, methods and tools for assessing and managing the human dimension of sustainable use and management of natural resources at local, regional and global scale, by integrating legal, political, social, economic, cultural and ethical aspects;
- develop sustainability business ideas and strategies for their implementation.

### Ethical and intercultural competences:

Graduates of the programme are qualified to

- comprehend and take into account different attitudes and approaches to natural resource management in the context of cultural and ethical diversity, and different stages of economic and societal development;
- linking natural resource management and ecological engineering to global development;
- use professional English in all oral and written communication.

### **1b) Professional qualifications**

Within the thematic field covered by NARMEE and the elected specialisations, the graduates of this master curriculum will qualify for employments and entrepreneurship related to the management of natural resources and ecological engineering of environmental risks. Professional fields and types of employment may include:

- Consultancy in environmental resource management and ecological engineering at national, EU and international level;
- Business for sustainability and development;
- Employment in international organisations dealing with resource management, environmental and sustainability issues (e.g. FAO, WHO);
- Employment in European agencies dealing with resource management, environmental and sustainability issues (e.g. EU Commission and associated agencies);
- Employment in and consultancy for non-governmental organizations and development agencies;
- Employment in national governmental organisations (e.g. environmental departments);
- Employment in communities and community-owned associations and enterprises related to resource and environmental risk management;
- Employment in public and private education systems / organizations (may require additional didactic qualifications);
- Employment in public and private research organisations and the higher education sector (e.g. universities, colleges, research units of national states and EU).

## § 2 ADMISSION REQUIREMENTS

Students can start the master's programme at all three partner universities (acting as home university) and have to spend 1-2 semesters at one of the partner universities (acting as host university). Admission and application within the master's programme NARMEE are processed by the home university.

Admission at BOKU:

For graduates of bachelor's programmes, mastery of the following learning outcomes with a minimum amount of ECTS as indicated below is required for admission:

LEARNING OUTCOME	ECTS
Comprehend and apply fundamentals of mathematics and statistics	6
Know and comprehend fundamentals of physics	3
Know and comprehend fundamentals of chemistry	3
Know and comprehend fundamentals of geology, geomorphology and soil science	6
Know and comprehend principles of hydraulics, water and waste management	6
Know and comprehend fundamentals of meteorology and climatology	2
Know and comprehend fundamentals of the biology of plants and animals	6
Know and comprehend fundamentals of microbiology	3
Know and comprehend general principles of ecology and biogeochemical cycles	3
Know and comprehend fundamentals of macro-economy and micro-economy	4
Know and comprehend the general principles of law and policy	4
Know the principles of GIS and remote sensing and apply GIS at least to simple problems	2

In addition, knowledge of English at level B2 (Common European Framework of Reference for Languages) is required and has to be verified.

## § 3 PROGRAMME STRUCTURE

### 3a) Duration, total ECTS credits, and structure

The programme consists of courses and other requirements worth a total of 120 ECTS credits, equivalent to four semesters (a total of 3,000 60-minute credit hours). The language of instruction is English.

NARMEE is addressing the following thematic fields:

- Agro-municipal resources management
- Ecological engineering and risk management
- Nature conservation and biodiversity management
- Global resources and sustainability management

- Human dimension and socio-economic aspects of sustainable development

Students can start the master's programme at any of the three partner universities (acting as home university) and have to spend 1-2 semesters at one of the other partner universities (acting as host university).

### **BOKU Home University**

The NARMEE curriculum consists of the following main components:

<b>General structure</b>		
<b>Semester</b>	<b>International Master in Natural Resources Management and Ecological Engineering</b>	<b>ECTS credits</b>
1 and 2	Introduction (compulsory)	12
	General skills and research methods (compulsory elect)	12
	Fundamentals of natural resources (compulsory elect)	12
	Specialisations in thematic fields (elective)	12
	Thesis-related subjects and research skills (compulsory & free elective)	12
3 and 4	Master's thesis	30
	Courses related to fundamentals and /or the thematic fields of the specialisations at the partner university (compulsory & elective)	30

### **BOKU Host University**

Students have to follow the respective curriculum at their home university.

They have to take 30 ECTS credits of courses at BOKU: 20 ECTS credits out of this curriculum, 10 ECTS credits free elective courses. Additionally, the master's thesis is co-supervised (see § 8).

### **3b) Three-pillar principle**

The three-pillar principle is the central identifying characteristics of both the bachelor's and master's programmes offered at the University of Natural Resources and Life Sciences, Vienna. In the master's programmes, the sum of the compulsory and elective courses must be made up of at least

- 15% technology and engineering
- 15% natural sciences
- 15% economic and social sciences, law

The master's thesis and free electives are excluded from the three-pillar rule.

## § 4 COMPULSORY COURSES AT BOKU

A total of 38 ECTS required to complete the master's programme (BOKU home university) is allocated to compulsory and compulsory elect teaching components:

- Introduction (12 ECTS, compulsory)
- General skills and research methods (12 ECTS, compulsory elect)
- Fundamentals of natural resources (12 ECTS, compulsory elect)
- Master's thesis seminar (2 ECTS, compulsory elect)

The main component **Introduction** comprises two compulsory subjects (6 ECTS each):

Introduction			
Subject	Course title	Course type	ECTS credits
Introduction I	Introduction in natural resources management and ecological engineering	VS	3
	Resource and environmental economics	VO	3
Introduction II	Biogeochemistry of soils	VU	3
	Lecture series in soil, water and atmosphere	VO	3

In the main component **General skills and research methods** two out of four subjects need to be elected. Within both elected subjects, one modular unit (6 ECTS) has to be completed:

General skills & research methods			
Subject	Course title	Course type	ECTS credits
Spatial data analysis and integration	Remote sensing and GIS in natural resource management	VO	3
	Remote sensing and GIS in natural resource management	UE	3
	OR:		
	Remote sensing and image processing	VU	6
Statistical data analysis	Environmental statistics	VU	3
	Statistics of extreme events and geostatistics	VS	3
	OR:		
	Uncertainties in hydrological and ecosystem modelling	VU	3
	Environmental statistics	VU	3

Mathematical modelling of natural resources and their management	Hydrological processes and modelling	VU	3
	Simulation in vadose zone environment	VU	3
	OR:		
	Applied mathematical programming in natural resource management	VS	3
	Computer simulation in energy and resource economics	VS	3
	OR:		
Methods in economics, social sciences and cross cultural management	Computer based river modelling	VU	3
	Soil erosion models and their application	VU	3
	Managerial economics	VU	3
	Valuation methods for natural resources	VO	3
	OR:		
	Intercultural communication	VU	3
	Principles of empirical research in the social sciences	VS	3
	OR:		
	Technology assessment	VS	3
	Project management	VU	3

In the main component ***Fundamentals of Natural Resources*** two out of five subjects need to be elected. Within both elected subjects, one modular unit (6 ECTS) has to be completed:

Fundamentals of natural resources			
Subject	Course title	Course type	ECTS credits
Soil resources	Soil physics and chemistry	VO	3
	Soil chemistry laboratory	UE	3
	OR:		
	Soil ecology	VO	3
	Field course in soil ecology	UE	3
	OR:		
	Soils of the world: genesis and classification	VU	3
	Soil indicators	VO	3
	OR:		
	Description, functions of soil structure and its Changes in agricultural land use	VX	3
	Soil properties and processes for ecological engineering	VU	3



Water resources and climate	Ecology of aquatic systems	VS	3
	Hydrogeology	VU	3
	OR:		
	Meteorological conditions and precipitation	VS	3
	Advanced topics on hydrology	SE	3
	OR:		
	Limnology	VU	3
	Limnochemistry and nutrient cycling	VU	3
	OR:		
	Physical environment of riverine landscape	VO	2
	River habitat and landscape assessment	VU	4
	OR:		
Bioresources, biodiversity and ecology	Biology, chemistry and microbiology for civil engineering	VU	3
	Sediment regime and river morphology	VO	3
	Ecology and population biology of plants in agroecosystems	VX	5
	Farmland ecology	SE	1
	OR:		
	Biocultural diversity in rural landscapes	VS	3
	Conservation biogeography and genetics	VS	3
	OR:		
	Taxonomy and ecology of benthic invertebrates	VU	3
	Ecology of fishes	VO	3
	OR:		
	Fish sampling and monitoring	VÚ	3
	Fish ecological status assessment	VU	3
	OR:		
	Benthic invertebrate sampling and monitoring	VU	3
	Benthic invertebrate status assessment	VU	3
	OR:		
	Introduction to tropical ecology	VO	2
	Crop production in the tropics and subtropics	VO	4

(Bio) chemistry of natural resources	Biophysical chemistry	VU	3
	Bioorganic chemistry	VO	3
	OR:		
	Kinetics of biochemical reactions	VU	3
	Proteomics	VU	3
	OR:		
Fundamentals of natural resource management	Stable isotopes (C,N,S,O,H) in soil and environmental sciences	VX	3
	Isotope and tracer hydrology	VU	3
	Decision support systems	SE	3
	Multiple criteria decision making in natural resource management	VS	3
	OR:		
	Game theory in environmental and natural resource management	VO	3
	Principles of commodity markets and trade policy	VO	3

A compulsory master's thesis seminar (2 ECTS) related to the topic of the master's thesis (***Thesis-related subjects and research skills***) must be completed:

Master's Thesis Seminar			
Subject	Course title	Course type	ECTS credits
Thesis-related subjects	Master's thesis seminar	SE	2

## § 5 ELECTIVE COURSES AT BOKU

In the main component ***Specialisations in thematic fields*** one of the following five thematic fields has to be elected. Within the elected thematic field two modular units (6 ECTS) from either one or two of the offered subjects need to be completed:

- Agro-municipal resource management
- Ecological engineering risk management
- Nature conservation and biodiversity management
- Global resources and sustainability management
- Human dimension and socio-economic aspects of sustainable development

Thematic field ***Agro-municipal resource management:***

Agro-municipal resource management			
Subject	Course title	Course type	ECTS credits
Soil management and protection	Soil conservation	VU	3
	Soil water management	VO	3
	OR:		
	Soil fertility and soil ecology in organic agriculture	VU	3
	Soil protection	VO	3
	OR:		
	Interdisciplinary project work: soil sciences	PJ	6
	OR		
	Rhizosphere processes and application to a griculture and soil protection	VO	3
Forest services and management	Ecology and management of the rhizosphere in ecological engineering	UE	3
	Air pollution effects on forest ecosystems	VS	3
	Forest and water	VS	3
	OR:		
	Agroforestry in mountain regions	VS	3
	Field camp II - concepts and methods of site ecology, forest growth and yield	PJ	3
	OR:		
Water resource planning and waste management	Field camp I - Introduction to mountain forestry and forest sciences	VX	2
	Natural resource management in mountain Forests	VS	4
	Water resources planning and management	VO	3
	Irrigation design	VU	3
	Methods in environmental biotechnology	UE	3
	Planning and assessment of waste management systems	VU	3

Thematic field ***Ecological engineering and risk management:***

<b>Ecological engineering and risk management</b>			
<b>Subject</b>	<b>Course title</b>	<b>Course type</b>	<b>ECTS credits</b>
Mitigation of natural hazards and erosion control	Mountain hazard processes	VX	6
	OR:		
	Geotechnics	VO	3
	Soil and water bioengineering – principles and applications	VS	3
	OR:		
	Hydraulic engineering and river basin management	VO	3
	Integrated flood risk management	VO	3
	OR:		
	Ecologically oriented methods and monitoring in river engineering	VU	3
	Flood forecasting and flood protection	SE	3
	OR:		
	Risk management and vulnerability assessment	VS	3
	Protection and mitigation measures against natural hazards	VX	3
Management and remediation of polluted soils and environments	Soil pollution and remediation	VU	3
	In-situ treatment of polluted soils and sediments: phytoremediation, in-situ fixation and attenuation techniques	UE	3
River and river landscape management and	Human impacts in riverine landscapes	VO	2
	Ecological river landscape management	VO	2
	Applications in river landscape management	VX	2
Sanitary engineering and water pollution control	On site solutions for water supply and sanitation	VO	3
	Planning and design in water supply and wastewater treatment	UE	3

Thematic field ***Nature conservation and biodiversity management:***

Nature conservation and biodiversity management			
Subject	Course title	Course type	ECTS credits
Biodiversity and conservation in aquatic, semi-terrestrial and terrestrial environments	Environmental impacts on riverine ecosystems I	SE	4
	Environmental impacts on riverine ecosystems II	SE	2
	OR:		
	Fisheries management and conservation	VS	2
	Aquatic biomonitoring and –assessment	VO	2
	Ecohydromorphological mapping	VU	2
	OR:		
	Ecology, restoration and conservation of aquatic and riparian vegetation	VU	2
	Biodiversity and conservation of mountain forests	VS	2
	Fire management in mountain forest ecosystems - prophylaxis and control	VS	2
	OR:		
	Management and forest protection in high altitude Afforestations and protective forests	VX	3
	Mountain forest dynamics and fire ecology	VS	3
	OR:		
	Protection of natural resources by organic farming	VS	3
	Crop production systems in organic agriculture	VU	3

Thematic field **Global resources and sustainability management:**

Global resources and sustainability management			
Subject	Course title	Course type	ECTS credits
Global aspects of land and soil resource management	Soils and food security	VU	2
	Soils and global change	SE	4
	OR:		
	Soil problems in aridic and semiaridic regions	VO	3
	Soil management in tropical and subtropical developing regions	VO	3
	OR:		
	Climate change and global aspects in planning and spatial development	VX	6
Global aspects of water and forest resource management and climate change mitigation	Possible impacts of climate change on water resources	VO	3
	Agriculture, climate change and transition	SE	3
	OR:		
	Water resources management in developing co-operation	VU	3
	Appropriate technologies for water supply & sanitation in developing countries	VO	3
	OR:		
Global aspects of waste management	Innovations for sustainable forest management	VS	4
	Adapting forest management to climate change	VS	2
	Radioactive waste management – its perception and acceptance I	VO	2
	Radioactive waste management – its perception and acceptance II	VO	2
	Life cycle management	VO	2
	OR:		
Global aspects of renewable energy resources	Global waste management I	VO	3
	Global waste management II	VO	3
	Renewable energy resources	VX	3
	Technology assessment and risk management considering wind power plants	SX	3

Thematic field ***Human dimension and socio-economic aspects of sustainable development:***

Human dimension and socio-economic aspects of sustainable development			
Subject	Course title	Course type	ECTS credits
Environmental policy, forecast and networking	Applied methods of rural water management in the tropics and subtropics	SE	3
	Water legislation	VO	2
	Development cooperation in the water sector	VO	1
	OR:		
	Global networking	SE	6
	OR:		
	Rural development	VO	3
	Introduction to development cooperation	VU	3
	OR		
	Foresights - what future to expect? (Late lessons from early warnings)	VU	3
	Land use and global change: Socio-ecological interactions	VS	3
	OR:		
	Transformative Development	VS	3
	System analysis, strategic planning and policy modelling with system dynamics	VU	3
Sustainable development, development research and innovation	OR:		
	Facilitating change for sustainable development	VS	6
	OR:		
	Growth, development, trade and environment	VO	3
	Science and technology studies: understanding sustainable innovation	SE	3
	OR:		
	Project design and sustainable development goals (SDGs)	VS	3
	Scientific communication and impacts	VS	3
	OR:		
	Negotiating change: simulating an international conference for sustainable development	VS	6

## § 6 FREE ELECTIVES AT BOKU

Free elective subjects amounting to 10 ECTS need to be chosen within the main component ***Thesis-related subjects and research skills*** according to the topic of the master's thesis.

The free electives may be selected from all courses offered by all recognized universities in Austria and abroad and need to be confirmed by the master's thesis supervisor and the NARMEE programme coordinator before including them into the individual course plan.

It is recommended to include one course (1-3 ECTS) related to the topic of the master's thesis aimed at training the ***Research and scientific writing skills***. Examples of relevant courses offered at BOKU are listed in Annex B.

## § 7 COURSES AT THE PARTNER UNIVERSITIES

Students with BOKU as home university have to complete 30 ECTS of courses at one of the partner universities:

### (1) Lincoln University, New Zealand (LU)

Students have to complete three modular units (all 600 Level, each 10 ECTS), including one compulsory unit related to the main component ***Fundamentals of natural resources***, one elective research course related to the topic of the master's thesis, and one elective unit related to the main component ***Specialisations in thematic fields***. The selection of the thematic fields and related individual courses requires consent of the programme coordinator at Lincoln University.

In the main component ***Fundamentals of Natural Resources*** the compulsory subject ***Fundamentals of natural resource management*** (10 ECTS) needs to be completed. The course offered depends on the term:

Fundamentals of natural resources			
Subject	Semester	Course title	ECTS credits
Fundamentals of natural resource management	Term 1	Environmental Policy and Planning (ERST 630)	10
	OR:		
	Term 2	Aspects of Sustainability in an International Perspective (ERST 636)	10

In the ***Thesis related subjects*** one research unit (10 ECTS) which is specifically related to the individual master's thesis topic needs to be completed. The courses offered depend on the master's thesis topic. The unit will be offered by the co-supervisor and can either be a research placement, research essay or a methods course.



In the main component **Specialisations in thematic fields** one modular unit (course, 10 ECTS) from the following three thematic fields has to be elected:

- Ecological engineering risk management
- Nature conservation and biodiversity management
- Human dimension and socio-economic aspects of sustainable development

**Thematic fields** and courses currently offered at Lincoln University:

Specialisations		
Thematic field	Course title	ECTS credits
Ecological engineering and risk management	Courses which begin with the abbreviations ECOL, ENGN, ERST, MICR, PHSC, PLPT, SOCI, SOSC or TRAN	10
Nature conservation and biodiversity management	Courses which begin with the abbreviations ECOL, ERST or PLPT	10
Human dimension and socio-economic aspects of sustainable development	Courses which begin with the abbreviations ECON, ERST, BMGT or SOCI	10

Upon consent with the programme coordinators at Lincoln University and BOKU also courses related to the following two thematic fields may be taken (currently no explicit listing of courses available):

- Agro-municipal resources management (10 ECTS)
- Global resources and sustainability management (10 ECTS)

## (2) Czech University of Life Sciences Prague (CZU)

In the three main components **Fundamentals of natural resources**, **Specialisations in thematic fields** and **Thesis-related subjects** students have to complete modular units (courses) amounting to a total of 30 ECTS.

In the main component **Fundamentals of natural resources** students can elect courses amounting up to 25 ECTS from the following subjects:

- Compulsory subjects
- Compulsory optional subjects – Group A: Fundamentals of natural resources

In the main component **Specialisations in thematic fields** up to 30 ECTS can be elected from subjects of the following thematic fields:

- Agro-municipal resource management (0-12 ECTS)
- Ecological engineering and risk management (0-12 ECTS)
- Nature conservation and biodiversity management (0-12 ECTS)
- Global resources and sustainability management (0-12 ECTS)
- Human dimension and socio-economic aspects of sustainable development (0-12 ECTS)

While no compulsory courses are required at CZU, in order to meet CZU' requirements for the joint degree, the **ELECTED** courses from CZU and BOKU together should cover the subjects of the following corridors:

- *Soil Properties and Conservation: Soil and Chemical Relationship, Soil Conservation and Protections*
- *Water Resources and Management: Soil and Water Relationship, Water Resources Management*
- *Atmosphere, Biosphere and Environment: Advanced Meteorology, Soil and Plant Relationship, Agricultural Ecology, Environmental Contamination and Remediation.*

(to be specified in consent with the programme coordination at CZU).

A maximum of 6 ECTS free elective subjects may be chosen within the main component *Thesis-related subjects and research skills* according to the topic of the master's thesis. The subjects may be selected from any course offered by CZU and needs to be confirmed by the NARMEE programme coordination at CZU and BOKU before including them into the individual course plan.

## **§ 8 MASTER'S THESIS**

A master's thesis is a paper on a scientific topic, to be written as part of a master's degree programme (for exceptions please see the bylaws (Satzung) of the University of Natural Resources and Life Sciences, Vienna, part III- Teaching, § 86 [9]). The thesis is worth a total of 30 ECTS credits. With their master's theses, students demonstrate their ability to independently address a scientific topic, both thematically and methodologically (§ 51 [8] UG 2002 BGBl. I no. 81/2009).

The topic of a master's thesis shall be chosen in such a way that it is reasonable to expect a student to be able to complete it within six months. Multiple students may jointly address a topic, provided that the performance of individual students can be assessed (§ 81 [2] UG 2002 BGBl. I no. 81/2009).

The master's thesis has to be completed and defended at the home university, and must be co-supervised by the host university.

Each student has two thesis supervisors, the main supervisor from the home university and a co-supervisor from the host university. The expertise of the main supervisor needs to fall within the thesis theme.

The master's thesis shall be written in English. The thesis defensio must be held in English.

## **§ 9 COMPLETION OF THE MASTER'S PROGRAMME**

The master's programme in Natural Resource Management and Ecological Engineering (NARMEE) has been completed when the student has passed all required courses and received a positive grade on the master's thesis and defensio.

## **§ 10 ACADEMIC DEGREE**

The graduates of the master's programme in *Natural Resources Management and Ecological Engineering* who studied at the *University of Natural Resources and Life Sciences, Vienna* and *the Czech University of Life Sciences Prague* will receive a joint degree „Master of Science“, abbreviated „MSc“, from the University of Natural Resources and Life Sciences, Vienna, issued jointly with the Czech University of Life Sciences Prague. The Joint Degree will be issued by that university where the studies had been started („home university“).

The graduates of the master's programme in *Natural Resources Management and Ecological Engineering* who studied at *the University of Natural Resources and Life Sciences, Vienna and the Lincoln University, New Zealand*, are awarded the academic degree „Master of Science“, abbreviated „MSc“, issued only by that university where the studies had been started („home university“).

The academic degree MSc, if used, shall follow the bearer's name (§ 88 [2] UG 2002 BGBl. I no. 81/2009).

## **§ 11 EXAMINATION REGULATIONS**

(1) The master's programme in Natural Resources Management and Ecological Engineering is completed successfully upon completion of the following main components:

- Introduction (12 ECTS)
- General skills and research methods (12 ECTS)
- Fundamentals of natural resources (12 ECTS)
- Specialisations in thematic fields (12 ECTS)
- Thesis-related subjects and research skills (12 ECTS)
- Master's thesis (30 ECTS)
- Courses related to fundamentals /the thesis and /or the thematic fields of the specialisations at the partner university (30 ECTS)

(2) Student evaluation takes the form of course and module examinations. Course examinations can be either written or oral, as determined by the course instructor, taking the ECTS credit value of the course into account. Any prerequisites for admission to examinations shall be listed in § 4 under the respective course/module.

(3) Student evaluation in modules: Module evaluation is based on the grades given the students in the individual courses that make up the module. The total evaluation for the module is calculated as the average of the grades of all module courses, weighted by ECTS credits. Average values of .5 or lower are rounded to the better (numerically lower) grade; values of over .5 are rounded to the worse (numerically higher) grade. If deemed necessary, the Dean of Students may require a module examination at his/her discretion.

(4) The choice of examination method shall be based on the type of course: Lectures shall conclude with a written or oral examination, if continuous assessment of student performance is not applied. Seminars (SE) and project-based courses (PJ) can be evaluated based on independently written papers, length and contents of which are determined by the course instructor. For all other course types, the examination type is at the instructor's discretion.

(5) After the successful completion of all the courses and examinations required in the master's programme, the completed master's thesis, after it has been given a positive evaluation by the thesis supervisor and co-supervisor, shall be publically presented by the student and defended in the form of an academic discussion (defensio). The committee shall consist of a committee chair and two additional university teachers with a *venia docendi* or equivalent qualification. The student's total performance (thesis and defensio) will be assigned a comprehensive grade. Both thesis and defensio must receive a passing grade for the student to complete the programme. The written evaluations stating the rationale for the thesis grade and the defensio grade are included in calculating the comprehensive grade and are documented separately.

The comprehensive grade is calculated as follows:

- Master's thesis: 70%
- Defensio (incl. presentation): 30%

(6) A comprehensive evaluation of the student's performance on the entire programme shall be assigned. A comprehensive evaluation of "passed" means that each individual component of the programme was completed successfully. If individual components of the programme have not been successfully completed, the comprehensive evaluation is "failed". A comprehensive evaluation of "passed with honours" is granted if the student has received no grade worse than a 2 (good) on all individual components, and if at least 50% of the individual components were graded with 1 (excellent).

## **§ 12 TRANSITIONAL PROVISIONS**

Students who have not completed their studies according to the previously valid curriculum Natural Resources Management and Ecological Engineering (NARMEE) when this new curriculum comes into force will be switched to this new curriculum. In this case, already passed exams for courses in the previously valid curriculum will be recognized towards this new curriculum based on the list of equivalent courses.

## **§ 13 EFFECTIVE DATE**

This curriculum shall take effect on October 1, 2023.

## **ANNEX A    TYPES OF COURSES**

The following types of courses are available:

*(Please only offer course types included in this list from now on.)*

### **Lecture (VO)**

Lectures are courses in which certain areas of a subject and the methods used in this area are imparted through didactic presentation.

### **Exercise course (UE)**

Exercise courses are courses in which students are instructed in specific practical skills, based on theoretical knowledge.

### **Practical course (PR)**

Practical courses are classes in which students deal with specific topics independently, based on previously acquired theoretical and practical knowledge.

### **Compulsory internship seminar (PP)**

The compulsory internship seminar is a class in which students deal independently with topics related to their internship placements, based on previously acquired theoretical and practical knowledge.

### **Seminar (SE)**

Seminars are courses in which students are required to work independently on the respective subject, deepen their knowledge of the topic and discuss relevant issues.

### **Field trips (EX)**

Field trips are courses in which students have the opportunity to experience relevant fields of study in real-life practical application, to deepen their knowledge of the respective subject. Field trips can be taken to destinations both in Austria and abroad.

### **Master's thesis seminar (MA)**

Master's thesis seminars are seminars intended to provide students with academic support during the thesis writing process.

### **Mixed-type courses:**

Mixed-type courses combine the characteristics of the courses named above (with the exception of project-type courses). Integration of different course-type elements improved the didactic value of these courses.

### **Project course (PJ)**

Project courses are characterized by problem-based learning. Under instruction, students work - preferably in small groups - on case studies, applying appropriate scientific methods.

### **Lecture and seminar (VS)**

### **Lecture and exercise (VU)**

### **Lecture and field trip (VX)**

### **Seminar and field trip (SX)**

### **Exercise and seminar (US)**

### **Exercise and field trip (UX)**