



***Curriculum of the International Master degree
programme***

**“Natural Resources Management and Ecological
Engineering - NARMEE”**

Code: 066 416

**University of Natural Resources
and Life Sciences, Vienna**

Center for International Relations

For legal purposes, only the version of the curriculum that has been published in the official journal (Mitteilungsblatt) is binding and valid - this English translation is for information purposes only.

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<p style="text-align: center;">Curriculum of the Master degree programme “Natural Resources Management and Ecological Engineering” At the University of Natural Resources and Life Sciences, Vienna</p>

As at October 1st, 2010

§ 1 Description of qualification

General goals of the field of study

This International Master Programme is based on a collaboration between BOKU, the University of Natural Resources and Life Sciences, Vienna, Lincoln University, New Zealand (LU), and CULS, Czech University of Life Sciences, Prague. The “International Master in Natural Resources Management and Ecological Engineering” is held in English. The focus is on preparing students for an international career in Natural Resources Management and Ecological Engineering by enhancing comparative studies at different universities (in the southern and in the northern hemisphere.)

The interdisciplinary Master degree programme contains the fields of Environmental Engineering, Mountain Risk Engineering, Forestry and Environment and Bio Resources Management. The courses offered are supplemented by the implementation of fields from the social sciences, law and business sciences.

Fields of activity

Graduates of the Master degree programme Natural Resources Management and Ecological Engineering are focused on sustainable management of environmental resources. Graduates have to take economic, ecologic, social and cultural aspects into consideration when working.

Profile of requirements

Natural Resources Management and Ecological Engineering requires a high level of interdisciplinary and integrative abilities as well as distinct competences in the fields of leading and management, social behaviour, economy, law, natural sciences and technical knowledge.

Special educational goals

The present Master study program is comprised of four modules which are defined in § 2. The education imparts an introduction to general international regulations. One core area is the nature based process mastering which is equally important for management and engineering tasks.. Special educational goals are integral Risk Management, Environmental Engineering, Nature Conservation and Wildlife Management as well as international Business Management and Sustainability.

Fields of work

Graduates of the Master degree programme of the Master Programme are especially enabled to work in the following fields of work: Management and Administration with national and international focus, especially international Organisations

Generally for management and administrative work in national and international context, in specific international organizations (private or state-run) such as the European Commission, FAO etc., technical and administrative planning agencies, that are involved with questions related to development cooperation, national-wide for environmental associations, consulting engineers, freelance consulting offices, in the field of quality management as well as in teaching and research. Further job options open up in the following fields: Sustainable Management of Natural Resources, Environmental Management, Ecological Engineering or Business for Sustainability.

§ 2 Format of the Master degree programme

The International Master in Natural Resources Management and Ecological Engineering is a joint degree programme based on collaboration between BOKU, the University of Natural Resources and Life Sciences, Vienna, Lincoln University, New Zealand (LU), and CULS, Czech University of Life Sciences, Prague.

The International Master degree programme in Natural Resources Management and Ecological Engineering comprises four semesters, is only held in English and is made up of 55 weekly semester hours, that is 120 ECTS credits including the Master Thesis. In addition, 6 weekly semester hours of free elective courses have to be completed as well as 2 weekly semester hours for the Master's Thesis seminar.

The programme comprises the following four **modules**:

Ecological Engineering (EE)

Nature Conservation & Wildlife Management (NC)

Risk Management (RM)

International Business and Sustainability (IB)

The following scheme illustrates the course of study. In the third semester, a definite decision by the students on the **specialisation (subject)** has to be made. The final **Master's thesis** has to be related to the selected specialisation in the third semester. In the course of the third or fourth semester a Master's Thesis has to be conducted, for which 30 ECTS are granted.

	Semester	ECTS (120)	SWS	<i>International Master in Natural Resources Management and Ecological Engineering</i>
Subjects	1	6	7	Introduction and Case Studies (6 ECTS)
		24	16	Basic Studies in EE, NC, RM, IB (24)
	2	30	20	General Skills (30)
Thesis and related subjects	3	30	12	Specialisation related to Thesis (18)
			6	Elective Field of Concentration (10)
			2	Master Thesis Seminar (2)
	4	30	-	Thesis (30)

§ 3 Admission to the Master degree programme

Students who graduated a professionally linked Bachelor degree programme in Austria or an international university are admitted to the Master degree programme Resources Management and Ecological Engineering.

A high command of English, which is essential for successful completion of this Master degree programme has to be proven for admission.

§ 4 Academic qualification

The International Master degree programme Natural Resources Management and Ecological Engineering is an engineering degree. In accordance with this classification of engineering degrees, graduates of the Master degree programme of BOKU, the University of Natural Resources and Life Sciences, Vienna, will be awarded with the Austrian academic qualification "Diplom-Ingenieur of technical sciences", shortened to "Dipl.-Ing." or "DI" (this degree equals the internationally accepted degree „Msc – Master of Science). Graduates of Czech University of Life Sciences Prague will be awarded with the degree "Master of Science in Natural Resources", shortened to "Msc". The University of Lincoln, New Zealand, awards graduates with the degree "Master of Natural Resources Management and Ecological Engineering" shortened to „M.Na.R.M. & E.E.“

§ 5 Types of courses

Courses within this degree are:

1. **Lectures (VO):** Courses in which portions of an academic discipline and the methods involved are didactically presented.
2. **Practical exercises (UE or PR):** Practical exercises are courses which have a factual connection to the relevant lecture and serve to teach specific practical abilities and skills.
3. **Proseminars (PS):** Courses which assist in the preparation of scientific work, where participants are expected to give an oral presentation and/or provide written work preferably in one of the main languages of the scientific literature.
4. **Seminars (SE):** Courses which assist in the preparation of scientific work, where participants are expected to give an oral presentation and/or provide written work preferably in one of the main languages of the scientific literature.
5. **Excursions (EX):** Courses which contribute to the illustration and consolidation of the course material.
6. **PJ:** These are characterised by problem-based learning. Within a certain topic, students work, primarily in small groups with assistance, through case studies involving the definition of a problem through realisation of the project to the production of written work.
7. **Combined courses:** all courses listed above from (1) to (5) can also be combined. For such courses, the regulations given should be used for the relevant sections.
8. **Interdisciplinary project studies (IP):** Courses which assist in the preparation of scientific work including data collection and discussion, where participants are expected to carry out data collection and analysis and provide an oral presentation and/or written work.

9. **Seminars for degree candidates (DS):** Courses dedicated to the scientific discussion and presentation of the work required for the thesis/dissertation.
10. For courses (which are inherently exam-based) where attendance is compulsory, the course lecturer should make it known, before the beginning of the course, when attendance is required. (Scope of compulsory attendance: UE, SE, PS, IP, DS = 100%, VU, VP, VS, VSX etc. = 30-70%).
11. All courses can also be held outdoors or at companies, as required.

§ 6 Timetable of Courses¹

The following courses from the sub-periods **1. Introduction and Case Studies** and **2. Master's Thesis Seminar** offer a total of **8 ECTS**, all of which are **compulsory**:

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
1. Introduction and Case Studies					
911.315	VO	Introduction	WS	4.0	4.0
811.354	VO	Case Studies in Sanitary Engineering	WS	3.0	2.0
2. Master's Thesis Seminar					
	SE	Master's Thesis Seminar	WS or SS	2.0	2.0

Basic Studies (a minimum of 24 ECTS has to be chosen)

Basic Studies offers a total of 37,5 ECTS of which 24 ECTS have to be chosen as **compulsory courses**:

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
ECOLOGICAL ENGINEERING (EE)					
811.356	VO	Water Supply and Wastewater Treatment	WS	2.0	3.0
816.338	VO	Water Resources Planning and Management	WS	3.0	2.0
816.335	VO	Introduction to Water and Soil (Soil Hydrological Processes)	WS	1.0	1.5
NATURE CONSERVATION AND WILDLIFE MANAGEMENT (NC)					

¹ A more detailed description of all courses, including objective of the course, course contents, name of lecturer, prerequisites, recommended reading, teaching methods, assessment methods and language of instruction, is found in the BOKUonline: <https://online.boku.ac.at/>

832.312	VX	(Eco-) tourism & Management of Protected Areas	SS	2.0	3.0
914.306	VW	Assessing Diversity in Forest Stands	WS	2.0	3.0
912.321	VU	Comparison of Mountain (Forest/non-) Ecosystems and Ecoregions	SS	2.0	3.0

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
RISK MANAGEMENT (RM)					

811.356	VO	Integrated Flood Risk Management (in Eng.)	WS	2.0	3.0
857.321	VO	Remote Sensing and GIS in Natural Resource Management	WS	2.0	3.0
857.320	UE	Remote Sensing and GIS in Natural Resource Management	WS	2.0	3.0
915.327	VU	Project Management	SS	2.0	3.0

INTERNATIONAL BUSINESS AND SUSTAINABILITY (IB)					
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731.324	VO	Resource and Environmental Economics	SS	2.0	3.0
731.325	VO	International Commodity Markets and Trade Policy (<i>Agricultural and Food Policy II</i>)	WS	2.0	3.0
732.326	VO	Institutions and Policies of the EU (<i>Introduction to the Law and Politics of the European Union</i>)	SS	2.0	3.0

A) Elective Courses

From the listed subjects **Ecological Engineering, Nature Conservation and Wildlife Management, Risk Management and International Business and Sustainability**, a minimum of 30 ECTS have to be chosen from the sub-period 1. General Skills and from the sub-period 2. Specialisation a minimum of 18 ECTS have to be chosen.

1. General Skills

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
ECOLOGICAL ENGINEERING (EE)					

771.304	SE	Environmental Chemistry	SS	3.0	4.5
811.357	VU	Biology, Chemistry and Microbiology for Civil Engineering	SS	2.0	3.0
816.342	VO	Possible Impacts of Climate Change on Water Resources	SS	2.0	3.0
816.340	VU	Ecologically Oriented Methods and Monitoring in River Engineering	SS	2.0	3.0
911.317	VU	Soil Properties and Processes for Ecological Engineering	SS	2.0	3.0

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
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NATURE CONSERVATION AND WILDLIFE MANAGEMENT (NC)					
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913.311	VS	Multiple Criteria Decision Making in Natural Resource Management	WS	2.0	3.0
933.302	VS	Protection of Natural Resources by Organic Farming	WS	2.0	3.0
832.302	VO	Human dimensions in wildlife research & management	SS	1.0	1.5
832.311	VX	More Recent Conflict Species in Wildlife Management	SS	1.0	1.5

RISK MANAGEMENT (RM)					
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871.322	VS	Science of Natural Mountain Disasters	WS	3.0	4.5
871.304	VS	Hazard and Risk Assessment	SS	3.0	4.5
915.344	VS	Technology Assessment	WS	3.0	4.5
732.304	VS	Social Studies of Risk	SS	3.0	4.5
874.300	VY	Soil- bioengineering techniques (slopes & gullies)	SS	2.5	3.5
732.318	VS	Forest Policy Analysis	SS	2.0	3.0

INTERNATIONAL BUSINESS AND SUSTAINABILITY (IB)					
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731327	VO	Principles of Empirical Research Methods in the Social Sciences	SS	2.0	3.0
731328	VO	Valuation Methods for Natural Resources <i>(Economic Valuation of Market Goods and Natural Resources)</i>	SS	2.0	3.0
735329	VO	Decision Making in Management with Special Emphasis on Cultural Differences	SS	2.0	3.0
731347	VO	Regional Economics and Regional Governance	SS	2.0	3.0

2. Specialisation

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
ECOLOGICAL ENGINEERING (EE)					
811.358	UE	Planning and Design in Water Supply and Wastewater Treatment	SS	2.0	3.0
813.359	VO	Waste Recycling and Composting	SS	2.0	3.0
911.318	UE	Ecology and Management of the Rhizosphere in Ecological Engineering	WS	3.0	4.5
816.339	VO	Sediment Regime and River Morphology	SS	2.0	3.0
815.306	PR	Applied Soil Physics	SS	3.0	4.5
815.311	VU	Simulation in Vadose Zone	SS	3.0	4.5
911.319	UE	In-situ Treatment of Polluted Soils and Sediments: Phytoremediation, In-situ Fixation and Attenuation Techniques	WS	2.0	3.0
811.332	VU	Water Resources Management in Developing Co-operation	SS	2.0	3.0
811.360	VU	Modelling in Sanitary Engineering (Sewer, Treatment Plant + Receiver)	WS	3.0	4.5
811.362	VO	On Site Solutions for Water Supply and Sanitation	WS	3.0	4.5
811.363	VO	Industrial Water Management	SS	2.0	3.0
816.332	VU	Computer Based River Modelling	WS	2.0	3.0
815.321	VU	Soil Conservation and Soil Protection	WS	3.0	4.5
852.316	PJ	Global Design Studio	SS	3.0	4.5

NATURE CONSERVATION AND WILDLIFE MANAGEMENT (NC)

834.321	VS	Biocultural Diversity in Rural Landscapes	SS	2.0	3.0
913.306	VS	Modelling of Mountain Forest Ecosystem	WS	2.5	3.5
912.324	VO	Fire Ecology - Vegetation and Wildlife	SS	1.0	1.5
832.321	VS	BOKU International Wildlife Lectures	WS or SS	2.0	3.0
913.302	VS	Decision Support Systems	WS	2.0	3.0
732.333	VS	Innovations for sustainable Forest Management	WS	2.0	3.0
911.322	VU	Role of Soils in Nature Conservation and Wildlife Management	WS	1.0	1.5

<i>Number</i>	<i>Type</i>	<i>Name</i>	<i>Semester</i>	<i>SST</i>	<i>ECTS</i>
RISK MANAGEMENT (RM)					
871.319	VX	Protection and Mitigation Measures against Natural Hazards	SS	3.0	4.5
871.305	VS	Integral Risk Management	WS	2.0	3.0
911.320	VU	Risk Management by Soil Protection and Remediation	SS	1.0	1.5
816.343	VO	Environmental Risk Analysis and Management	SS	2.0	3.0
815.322	VU	Soil erosion models and their application	WS	3.0	4.5
816.347	VO	Application of GIS in Hydrology and Water Management	SS	2.0	3.0

INTERNATIONAL BUSINESS AND SUSTAINABILITY (IB)					
731.330	VO	International Trade and Environment	SS	2.0	3.0
731.331	VO	WTO and International Environmental Agreements	SS	2.0	3.0
731.333	VO	Globalization and Rural Development (Sociology of Sustainable Agriculture)	SS	2.0	3.0
731.335	VO	Sustainable Business Strategies	SS	2.0	3.0

§ 7 Courses offered at Partner Universities

(1) Lincoln University, New Zealand

Courses taken from the "Master Degree Subjects (all 600 levels)" of the Lincoln University can be chosen for the four specializations in accordance with the mentor at the Lincoln University who needs to approve the course selection.

Compulsory Courses are either course ERST 631 (Environmental Sciences in Environmental Policy) or course ERST 636 (Aspects of Sustainability in an International Perspective). One of the courses has to be chosen.

Recommendations:

1. Ecological Engineering (EE)

Subjects beginning with the prefixes ECOL, ENGN, ERST, MICR, PHSC, PLPT, SOCI, SOSC and TRAN.

2. Nature Conservation and Wildlife Management

Subjects beginning with the prefixes ECOL, ERST and PLPT.

3. Risk Management (RM)

Subjects beginning with the prefixes ENGN, ERST, PHSC and SOSC.

4. International Business and Sustainability (IB)

Subjects beginning with the prefixes ECON, ERST, BMGT and SOCI.

(2) Czech University of Life Sciences Prague

In order to provide evidence for the total of 40 ECTS at partner universities, BOKU Narmee students who wish to gain a double degree of the CULS, have to complete:

- 30 ECTS from the list of courses offered for MSc Natural Resources and Environment (NRE) or partially as NRE Master Thesis (for example 10 ECTS for the NRE Master Thesis and 20 ECTS from the course offer NRE) AND
- 10 ECTS freely selectable from the complete English course offer at the Czech University of Life Sciences Prague (especially from MSc Agricultural Economics and Management, MSc Technology and Environmental Engineering, Msc Forestry, Water and Landscape Management as well as MSc Informatics).

Only in the case that the student is already well grounded in one specific field, the students list can be adapted in accordance with the mentors at both universities (e.g. students with excellent expertise in the field of soil physics can instead choose other courses in accordance with the mentors).

§ 8 Thesis for the Master degree

- (1) The thesis for the Master degree constitutes an integral part of the International Master degree Natural Resources Management and Ecological Engineering. Due to the international focus of the Master degree programme the thesis has to be written in English.
- (2) The subject of the Master degree thesis must be chosen from a discipline relevant to the Master degree.
- (3) The university lecturer who suggests the subject chosen for the Master degree thesis is obliged to supervise that student.
- (4) For the Master thesis the supervision by a BOKU university lecturer and a university lecturer of a partner university is required (Principal of Double Supervision).
- (5) The Master degree thesis should be submitted to the Dean of the University..
- (6) 30 ECTS are granted for the Master degree thesis.

§ 9 Graduation requirements

1. For those parts of the Master degree programme completed at co-operating partner universities the examination regulations of the respective university have to be applied.
2. The final examination for the Master degree is taken in two parts.
3. The first part of the final examination for the Master degree comprises the modules detailed in § 6 above and is completed with the positive assessment of these courses.
4. The second part of the final examination for the Master degree can be conducted in two ways:
 - a) EITHER: An oral examination held before a committee, which includes the examination of the subject chosen for the Master degree thesis and the examination of one further subject which is considered to be the specialisation of the degree. This second examination subject has to be determined by the institution responsible for study judicial affairs in accordance with the students.

b) OR: A public defense of the Master thesis. For the public defense two examiners have to be nominated and an expert evaluation of the thesis has to be requested.

5. The registration to the second part of the Master degree graduation requires:

- Positive completion of 6 weekly semester hours (10 ECTS) of free elective courses.
- Positive completion of the courses stated in § 6.
- Positive completion of examinations to an extent of 30 ECTS and a double supervised Master thesis to the extent of at least 10 ECTS at a partner university. The Master thesis can be attributed to a partner university with 30 ECTS if also the Master examination is carried out there. Alternatively, the attribution is carried out proportionally and has to be arranged with the supervisors.
- Positive evaluation of the Master degree thesis.

§ 10 Study Fees at Lincoln University, New Zealand

If the appointed quota of exchange students is exceeded, the payment of study fees at Lincoln University New Zealand is intended. If the exchange duration due to a Master supervision exceeds one semester, a research fee has to be paid at Lincoln University. Information on scholarships can be found at the Center for International Relations at BOKU. The enrolment for the International Master Study Program Natural Resources Management and Ecological Engineering does not include a legal claim for a scholarship.