

Universität für Bodenkultur Wien

University of Natural Resources and Life Sciences, Vienna



Curriculum

for the Master Programme in

Wood Technology and Management

Programme Classification No. 066 426

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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 “Wood Technology and Management” At the University of Natural Resources and Life Sciences, Vienna</p>
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As at October 1st, 2016

§ 1 QUALIFICATION PROFILE

The Master programme in Wood Technology and Management is a 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.

1a) Knowledge and Personal and Professional Skills

The graduates of the Master study programme Wood Technology and Management are equipped with comprehensive knowledge, skills and abilities in order to take over executive functions in corresponding businesses, for service providers as well as in administration, in the field of the value added chain forest, wood and natural fibers and generally in the field of utilizing renewable resources. The graduates have professional competences in order to especially deal with technical and economic tasks in the service industries and production for a sustainable use of the raw material wood and natural fibers. The knowledge and competences acquired comprise not only the state of the technology and especially the field of current production but also the areas of research, development and innovation. The professional and personal competences of graduates are affected by the integration of engineering technology and contents taken from socio-economics, research-driven teaching, the promotion of independent knowledge building as well as problem-solving competences and skills in the field of communication and cooperation. Graduates are aware of their leadership abilities and the importance of lifelong learning, mobility and internationalization for their professional careers. Graduates of the Master study programme Wood Technology and Management are equipped with advanced language competences thanks to courses held in foreign languages and the internationalization of their learning environment in research and university education. They have the possibility to start networking with the economic sector and research institutions or other potential future employers while being enrolled in this study programme. The offered specialisation programmes allow for an in-depth specialisation in a more scientific-technical or technological-economic direction respectively.

1b) Professional Qualifications

Due to the interdisciplinary character (technical sciences and engineering, natural sciences as well as economics and social sciences) of the Master study programme Wood Technology and Management, graduates face an extensive range of professional activities and occupations based on their chosen professional academic specialisation. The occupational fields comprise all academically relevant tasks for an efficient use and the processing of renewable resources related to wood. This also includes connected economic

domains such as machine and plant engineering as well as the supply chain such as the gluing and varnish industry.

The fields of work for graduates of the Master study programme Wood Technology and Management exemplarily includes the following areas of private, public and non-profit sectors for the use of renewable resources with a focus on wood:

- Technical and economic organization of the production of wood and engineered wood as well as intermediate components and final products thereof.
- Research, development and innovation, also in respective service industry facilities (institutes), including the field of training and further qualification courses.
- Directing research and developmental institutions in the fields of solid wood, wood and fiber composite materials as well as wood industrial manufacturing.
- Strategic and operational management of businesses, departments (for example research and developmental departments, technology and product development, application engineering) related to questions of acquisition, production, logistics, market research and business potential planning.
- Counseling and consultancy firms, work as an authorized expert as well as tasks for testing institutes.
- Work for national and international interest groups and lobbies, environmental agencies, relevant non-governmental organizations, and others.
- Administrative work for the EU, federal, communal and regional governments.

§ 2 ADMISSION REQUIREMENTS

Graduates of the Bachelor programme in Wood and Fibre Technology (033 226) offered by BOKU University of Natural Resources and Life Sciences or thematically equivalent Bachelor programmes of all recognised national and international universities are eligible for admission with no further requirements.

Graduates of the Bachelor programme Forestry (033 225) are required to complete the following courses in order to complement their competences and skills:

Course Number	Course Title	Course Type	Semester	ECTS Credits
891103	Wood chemistry ¹	VO	WS	3.0
891106	Wood technology	VO	SS	4.0
893142	Introduction to process engineering	VO	SS	6.0

For graduates of Bachelor programmes completed at other universities, mastery of the following learning outcomes is required for admission:

- (1) Knowledge of basic subjects for wood science:
Mathematics, statistics, physics, chemistry, botany, material science, solid mechanics, process engineering, process technology, technical drawing, mechanical engineering, business administration, economics.

(2) Knowledge of central subjects of wood science:

Wood biology, diseases, pests and protection of wood and wood-based products, wood technology, electrical and control engineering, metrology, production management, wood machining, timber constructions, wood processing, ergonomics, wood products markets, accounting, forest sector policy, law.

When competences and skills of both areas can be assured via the positive completion of courses to an extent of 40 ECTS credit points each, a direct admission to the study programme takes place.

Furthermore, competences in English at a level of B2 (according to the Common European Framework of Reference for Languages by the Council of Europe) are recommended.

§ 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. This is equivalent to a duration of four semesters (a total of 3,000 60-minute credit hours). The programme is divided into

Compulsory courses:	36 ECTS credits, including
Master's Thesis seminar:	2 ECTS credits
Field trips:	3 ECTS credits
Internship:	3 ECTS credits
Master's Thesis:	30 ECTS credits
Elective courses:	42 ECTS credits
Free electives:	12 ECTS credits

Students are required to complete courses, which are related to the field of study, worth a total of 10 ECTS credits taught in a foreign language. These courses can be compulsory courses, elective courses or free electives. Courses taken at international universities abroad are to be credited. General language courses (with the exception of specialised language courses) will not be considered. (General foreign language courses may be credited in the framework of free elective courses.)

3b) Three-Pillar Principle

The three-pillar principle is one of the central identifying characteristics of both the Bachelor and Master programmes offered at the University of Natural Resources and Life Sciences, Vienna. In the Master 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, internship and free electives are excluded from the three-pillar rule.

3c) Limited Number of Participants in Courses

For courses with a limited number of participants the head of the Master course is authorized to first admit students enrolled in the Master programme (that means that students enrolled in a Bachelor study programme can only be admitted to the courses if further spaces are left on the course!) The admission of students enrolled in the Master study programme is conducted according to the following order of required courses by the students: compulsory course, elective course, free elective course.

§ 4 COMPULSORY COURSES

Used Abbreviations:

ECTS = European Credit Transfer System

WS = Winter Semester

SS = Summer Semester

Notes:

¹⁾ In English

²⁾ In English and German

³⁾ Courses not offered in the academic year 2016/17

⁴⁾ Courses only offered in uneven years

The following compulsory courses worth a total of 36 ECTS points are required to complete the Master programme:

Course Number	Compulsory Courses	Course Type	Semester	ECTS Credits
	Course Title			
892321	Solid state mechanics	VU	SS	3.0
892323	Technical materials	VO	SS	5.0
891326	Wood industry processes: solid wood primary and secondary processing	VO	WS	3.0
891327	Wood-industrial processes: wood- and fibre-based materials ¹	VO	WS	2.0
891309	Wood Industry laboratory	UE	WS	3.0
891328	Wood cutting, milling, moulding	VO	WS	2.0
734320	Procurement	VO	WS	1.0
735327	Market research and market analysis	VU	SS	3.0
734323	Business management I	VU	WS	3.0
733311	Business Planning	VO	SS	3.0
891310	Specialised field trip II	EX	WS	1.5
891329	Specialised Field Trip III ⁴	EX	WS	1.5
891332	Compulsory internship seminar - Wood technology and management ²	PP	WS or SS	3.0
890301	Master's thesis seminar ¹	SE	WS or SS	2.0

§ 5 ELECTIVE COURSES

Elective courses worth a total of no less than 42 ECTS credits are required to complete the Master programme. There are 2 options to achieve this.

5a) Option 1

Elective subjects to an extent of at least 42 ECTS credit points have to be completed successfully. 30 of these ECTS credit points have to be taken as modules. This corresponds to five modules from which all elective courses have to be completed successfully. 12 ECTS credit points can be chosen freely from the remaining elective courses.

Course Number	Module 1: Engineered Materials and Products	Course Type	Semester	ECTS Credits
	Course Title			
891333	Composite ¹	VO	WS	2.0
891334	Engineered wood products ¹	VO	WS	2.0
891336	Wood materials modification ¹	VU	WS	2.0
Course Number	Module 2: Wood and Fibre Science	Course Type	Semester	ECTS Credits
	Course Title			
892324	Wood physics	VU	SS	2.0
891337	Wood and fibre material performance	VU	SS	2.0
891338	Wood and fibre quality ¹	VO	WS	2.0
Course Number	Module 3: Biorefinery	Course Type	Semester	ECTS Credits
	Course Title			
891339	Wood - biotechnology	VS	SS	2.0
970304	Biobased and biodegradable plastics	VO	WS	2.0
774326	Chemicals from Biomass	VO	WS	2.0
Course Number	Module 4: Wood Industry Process Engineering and Manufacturing Systems	Course Type	Semester	ECTS Credits
	Course Title			
891340	Manufacturing systems	VO	WS	2.0
891341	Processing systems ¹	VO	SS	2.0
891342	Process control and analytics	VU	SS	2.0
Course Number	Module 5: Technology of Polymers	Course Type	Semester	ECTS Credits
	Course Title			
774327	Chemistry and technology of polymers	VO	WS	2.0
891343	Adhesives and gluing ⁴	VU	SS	2.0
891344	Coating and surfaces	VU	WS	2.0

Course Number	Module 6: Timber Construction	Course Type	Semester	ECTS Credits
	Course Title			
892312	Architects physics	VO	WS	2.0
891353	Timber engineering	VU	SS	4.0
Course Number	Module 7: Concurrent Engineering	Course Type	Semester	ECTS Credits
	Course Title			
891347	Product design ¹	VS	WS	2.0
735331	Strategic marketing planning in innovation processes	VU	WS	3.0
891348	Quality assurance and testing methods	VO	SS	1.0
Course Number	Module 8: Logistics Management	Course Type	Semester	ECTS Credits
	Course Title			
734329	Logistic systems	VS	SS	6.0
Course Number	Module 9: Advanced Planning and Simulation	Course Type	Semester	ECTS Credits
	Course Title			
734324	Simulation of enterprise processes	UE	SS	3.0
734328	Advanced planning systems in forest based industries ¹	SE	SS	3.0
Course Number	Module 10: Business Management and Controlling	Course Type	Semester	ECTS Credits
	Course Title			
734333	Controlling in the wood products industry	VU	SS	3.0
734327	Business management II	VU	SS	3.0
Course Number	Module 11: Environment	Course Type	Semester	ECTS Credits
	Course Title			
891323	Life-cycle analysis of wood and natural-fibre products	VS	WS	1.0
736133	Environmental Law	VO	WS	2.0
891349	Plant and environment technology	VS	SS	2.0
891350	Methods for the assessment of scrap wood	VO	SS	1.0
Course Number	Module 12: Tools and Methods	Course Type	Semester	ECTS Credits
	Course Title			
891325	Research design ¹	VU	WS	2.0
915327	Project management ¹	VU	SS	2.0
734334	Modeling of techno-economical processes	VU	WS	2.0

5b) Option 2

Elective courses worth a total of no fewer than 42 ECTS credits have to be completed. When a certain combination of six entire modules is completed successfully, this is regarded as a specialisation and can be listed in the Master's Thesis certificate. The additional 6 ECTS credit points can be chosen freely from the remaining elective courses. The following specialisations can be chosen:

- Wood Material Engineering and Processing
- Wood Industrial Management

Wood Material Engineering and Processing
Modules
Module 1: Engineered Materials and Products
Module 2: Wood and Fibre Science
Module 3: Biorefinery
Module 4: Wood Industry Process Engineering and Manufacturing Systems
Module 5: Technology of Polymers
Module 6: Timber Construction

Learning outcomes: In addition to the comprehensive pool of knowledge, skills and competences, which are provided by the three pillars principle of the BOKU compulsory core areas, the specialisation offers further specific competences for tasks that are scientifically founded in the fields of research, development and university teaching. The specialisation imparts further knowledge and skills for ecologically efficient design and manufacturing of materials and products from wood and natural fibers. These specialisations include content-related as well as methodical competences for the implementation of innovation processes with a focus on resource efficient technology development. Due to high share of courses held in foreign languages an international focus is also guaranteed.

Wood Industrial Management
Modules
Module 4: Wood Industry Process Engineering and Manufacturing Systems
Module 7: Concurrent Engineering
Module 8: Logistics Management
Module 9: Advanced Planning and Simulation
Module 10: Business Management and Controlling
Module 11: Environment

Learning outcomes: When taking courses of the specialisation Wood Industrial Management students acquire knowledge and skills for leading positions related to the entire production and value added chain of forests and wood including its related economic fields. In addition to a comprehensive pool of knowledge, skills and competences, which are provided by the three pillars principle of the BOKU compulsory core areas (§4), the specialisation offers specific competences for the strategic and operational management of businesses, business departments, institutes and organizations. The specialisation imparts further knowledge and skills in fields such as logistics, market research, product

development as well as business related potential planning and related innovation processes.

§ 6 FREE ELECTIVES

Free electives worth a total of 12 ECTS credits are required to complete the Master programme. Free electives may be selected from all courses offered by all recognized universities in Austria and abroad. Free electives are intended to impart knowledge and skills in the student's own academic subject as well as in fields of general interest.

When it comes to the choice of the option "Specialisation" it is recommended that the free elective subjects are chosen from the course offer of the elective courses according to §5 or from a list of recommended free courses.

§ 7 INTERNSHIP

An internship of a duration of 3 weeks is part of the curriculum of the Master programme in Wood Technology and Management. The internship is equivalent to a total of 3 ECTS points. Activities within the internship placement have to correspond to one of the fields of the Master programme in Wood Technology and Management.

The practical experience Wood Technology and Management which is supervised by university lectures of the study programme should be completed in accordance with the chosen options according to §5 in the environment of the management of businesses or organizations, scientific institutions or research and developmental departments on a national or international scale respectively.

For the completion of the internship, students have to present their experiences in the compulsory internship seminar "Practical experiences seminar – Wood technology and management."

§ 8 FIELD TRIPS

Both professional excursions of the compulsory core areas which are held alternatingly have to be completed successfully.

§ 9 MASTER'S THESIS

A Master's Thesis is a paper on a scientific topic, to be written as part of the Master programme Wood Technology and Management (for exceptions please see the By Laws of the University of Natural Resources and Life Sciences, Vienna, part III- Teaching, § 30[9]). The thesis is worth a total of 30 ECTS credits. With their Master's Thesis, 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 can be related to a subject area of the curriculum and 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 shall be written in German or English. Languages other than German or English are permissible only if approved and confirmed by the thesis supervisor. The thesis defence must be held in German or English regardless of the language of the thesis.

§ 10 COMPLETION OF THE MASTER PROGRAMME

The Master programme in Wood Technology and Management has been completed when the student has passed all required courses and received a positive grade on the Master's Thesis and defence examination.

§ 11 ACADEMIC DEGREE

Graduates of the Master programme in Wood Technology and Management are awarded the academic title Diplom-Ingenieur (m) or Diplom-Ingenieurin (f), abbreviated as Dipl.-Ing./ Dipl.-Ing.ⁱⁿ or DI/DIⁱⁿ.

The academic title Dipl.-Ing./Dipl.-Ing.ⁱⁿ or DI/DIⁱⁿ, if used, shall precede the bearer's name (§ 88 [2] UG 2002 BGBl. I no. 81/2009).

§ 12 EXAMINATION REGULATIONS

(1) The Master programme in Wood Technology and Management has been completed successfully when the following requirements (corresponds to components in [7] below) have been met:

- positive completion of compulsory courses worth a total of 36 ECTS credits (§ 4). This includes:
 - o positive completion of the Master's Thesis seminar worth a total of 2 ECTS credits (§4);
 - o positive completion of the field trips worth a total of 3 ECTS credits
 - o positive completion of the internship worth a total of 3 ECTS credits
- positive completion of elective courses worth a total of 42 ECTS credits (§ 5);
- positive completion of free electives worth a total of 12 ECTS credits (§ 6);
- a positive grade on the Master's Thesis and the defence examination.

(2) Student evaluation takes the form of course and module examinations. Modules are regarded as completed if all examinations of all the courses of the respective module have

been successfully completed. 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) 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 and project-based courses 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.

(4) The topic of the Master's Thesis shall be selected from one of the subjects of the Master programme. The student must inform the dean in writing prior to the commencement of the work on the Master's Thesis. Thereby, the student has to state the Master's Thesis topic as well as the name of the supervisor of the Master's Thesis.

(5) The completed Master's Thesis which has been assessed positively by the supervisor shall be publically presented by the student and defended in the form of an academic discussion (defence examination) after successful completion of all courses. The committee shall consist of a committee chair and two additional university lecturers with a *venia docendi* or equivalent qualification. The student's total performance (thesis and defence examination) will be assigned a comprehensive grade. Both thesis and defence examination must receive a passing grade for the student to complete the programme. The written evaluations stating the grounds for the thesis grade and the defence examination grade are included in calculating the comprehensive grade and are documented separately.

The comprehensive grade is calculated as follows:

- Master's Thesis: 70%
- Defence examination (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).

§ 13 TRANSITIONAL PROVISIONS

Students who are subject to the Master curriculum Wood Technology and Management (H 426, version 10U from October 1st, 2010) that was in action to date, are entitled to complete their study programme until November 30th, 2015.

For students who switch to the new Master programme curriculum, examinations for courses taken under the provisions of the previously valid curriculum shall be recognized towards the new programme under the provisions of this curriculum based on the list of equivalent courses.

§ 14 EFFECTIVE DATE

This curriculum shall take effect on October 1st, 2016.

ANNEX A TYPES OF COURSES

The following types of courses are available:

Lecture (VO)

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

Lab Course (UE)

Lab 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.

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.

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.

Lecture /Seminar (VS)

Lecture/Lab (VU)

Lecture/Field Trip (VX)

Seminar/Field Trip (SX)

Lab/Seminar (US)

Lab/Field Trip (UX)

ANNEX B RECOMMENDED FREE ELECTIVES

Recommended Free Electives:

Course Number	Course Title	Course Type	Semester	ECTS Credits
892325	Biomimetics - technical solutions from nature	VO	WS	2.0
735332	Marketing strategies	VO	WS	2.0
732311	Public relations - fundamental rules and conception	VU	WS	3.0
734351	Logistics in forestry and timber industry	US	SS	3.0
	"Industrieseminar" ³	SE	-	1.0
891001	Current issues concerning accredited testing ³	VS	WS	1.0
892313	Practice completing the lecture - architects physic	UE	WS	3.0
875310	Sustainable constructions	VU	WS	3.0
892300	Special topics of physics ²	VO	SS	2.0
892304	Scattering techniques in nanomaterials science ¹	VO	SS	2.0
892041	Recent problems in Material Sciences II	SE	SS	1.0