

## OFFICIAL TRANSLATION OF

**“Neufassung der Fachspezifischen Bestimmungen für den  
Studiengang ‚Wood Science‘ (M.Sc.)  
vom 4. Oktober und 3. April 2019“  
(Amtliche Bekanntmachung Nr. 33, vom 20. Juni 2019)**

**THIS TRANSLATION IS FOR INFORMATION ONLY –  
ONLY THE GERMAN VERSION SHALL BE LEGALLY  
VALID AND ENFORCEABLE!**

### **Revised Subject-Specific Provisions for the Master of Science in Wood Science**

**dated 4 October 2017 and 3 April 2019**

In accordance with Section 108 subsection 1 of the Hamburg higher education act (Hamburgisches Hochschulgesetz, HmbHG), dated 18 July 2001 (HmbGVBl. p. 171), last amended through Article 1 of the Act on 29 May 2018 (HmbGVBl. p. 200), the Executive University Board of Universität Hamburg in a meeting held on 31 May 2019 ratified the Revised Subject-Specific Provisions for the Master of Science in Wood Science, which were adopted by the Faculty of Mathematics, Informatics and Natural Sciences on 4 October 2017 and 3 April 2019 pursuant to Section 91 subsection 2 no. 1 HmbHG.

#### **Preamble**

These Subject-Specific Provisions supplement the provisions of the Faculty of Mathematics, Informatics and Natural Sciences' Examination Regulations (PO MSc) dated 11 April and 4 July 2012, as amended, governing Master of Science degree programs.

#### **Section 1**

##### **Program and examination objectives, academic degree, and implementation of the Degree Program**

##### **Section 1 subsection 1:**

The consecutive Master of Science in Wood Science is a research-oriented, international degree program taught in English. Graduates will develop and refine wood science topics using theoretical skills and practical research experience.

Graduates will couple fundamental forestry and environmental issues with the use of wood and wood-based materials and their effect on society. Furthermore, graduates will be able to demonstrate the optimal use of lignocellulosic materials in various fields of application based on scientific, technological, and economic knowledge. Students will be able to combine interdisciplinary issues and assess the effects of possible solutions. They will gain practical experience in conducting research projects and will acquire professional qualifications and social competencies.

### **Section 3**

#### **Subject advising**

#### **Section 3 subsection 4**

Students must consult with the module coordinator for subject advising before registering to retake a final module examination a second time, whereby a decision shall be made as to whether module courses should be repeated.

### **Section 4**

#### **Program and exam organization, modules, and ECTS credits**

#### **Section 4 subsection 1**

The Master of Science in Wood Science is an interdisciplinary degree program. The program consists of the following components:

1. Interdisciplinary fundamentals in the first semester (30 ECTS credits) consisting of a combination of modules handling scientific, engineering, technological, and economic issues
2. A specialization in required elective modules (48 ECTS credits) in the fields of wood chemistry, wood physics, wood biology, and forestry/economics
3. An in-depth examination through a research-oriented master's thesis (30 ECTS credits)
4. 12 ECTS credits from the elective area

**Section 4 subsection 2**

Recommended module plan for the Master of Wood Science:

<b>Module No.</b>	<b>Module Name</b>	<b>ECTS</b>	<b>Semester</b>
<b>Required modules</b>			
MWS01	Characteristics and Grading of Wood	6	1
MWS02	Usage of Timber—Environmental and Economic Impacts	6	1
MWS03	Project Management	6	1
MWS04	Fibers and Fiber-Based Products	6	1
Fund	Fundamentals of Management	6	1
<b>Required elective modules</b>			
MWS05	Wood Molecular Biology and Biotechnology	6	2 or 3
MWS06	Wood Degradation and Protection	6	2 or 3
MWS07	Wood Physiology and Biochemistry	6	2 or 3
MWS08	Paper and Board Technology	6	2 or 3
MWS09	Lignocellulose Biorefinery	6	2 or 3
MWS10	Biopolymers	6	2 or 3
MWS11	Solid Wood Technology	6	2 or 3
MWS12	Composite Technology	6	2 or 3
MWS13	Structural Applications of Wood	6	2 or 3
MWS14	Timber Production	6	2 or 3
MWS15	International Forestry and Timber Industries	6	2 or 3
MWS16	Data Sources and Modeling Timber-Related Industries	6	2 or 3
M1125	Bioresources and Biorefineries	6	2 or 3
M0543	Management, Organization and Human Resource Management	6	2 or 3
MWS17	Project Study	6	2 or 3
<b>Final Module</b>			
MWS-AB	Master's Thesis	30	4

		Credits																													
		1 2 3 4 5 6	7 8 9 10 11 12	13 14 15 16 17 18	19 20 21 22 23 24	25 26 27 28 29 30																									
Semester	1	Characteristics and Grading of Wood	Usage of Timber— Environmental and Economic Impacts	Project Management	Fibers and Fiber-Based Products	Fundamentals of Management																									
	2	Required elective modules				Elective modules																									
	3																														
	4	Master's Thesis																													

The description of all modules can be found in the table located in the Annex to the Subject-Specific Provisions for the Master of Science in Wood Science (module table). A detailed description of the modules can be found in the module catalog for the Degree Program.

**Section 4 subsection 3**

The final module shall be comprised of the master's thesis and an oral examination. The oral examination should be taken no later than six weeks after submission of the master's thesis.

**Section 5  
Course types**

Attendance is mandatory for practical courses, seminars, field trips, and project work.

**Section 13  
Completed coursework and module examinations**

**Section 13 subsection 1**

In the case of modules that include practical courses, field trips, projects, and/or seminars as courses, active participation in these courses is a prerequisite to take the final module examination.

**Section 13 subsection 2**

The type of examination for each module can be found in the table located in the Annex to the Subject-Specific Provisions for the Master of Science in Wood Science (module table) as well as in the module catalog for the Degree Program. If a module prescribes a written or oral examination, the type of examination shall be announced at the commencement of the module. Generally, written examinations last 90 minutes and oral examinations 30 minutes. Any deviation from this shall be announced prior to module registration.

**Section 13 subsection 6**

Examinations shall be held in the language of the course, as a rule English. Any changes will be announced prior to module registration.

**Section 14**  
**Master's thesis**

An application to commence work on the master's thesis may be submitted once at least 72 ECTS credits in the Degree Program have been earned and all required modules have been successfully completed.

The final module shall be comprised of the master's thesis (75%) and an oral examination (25%). The oral examination should be taken no later than six weeks after submission of the master's thesis.

**Section 15**  
**Evaluation of examinations**

In the elective area (12 ECTS credits), the courses selected are subject to the instructor's rules and regulations. The elective area and the Project Management module shall not be used to calculate the overall final grade.

The overall final grade is calculated as an average of module grades weighted according to ECTS credits.

**Section 23**  
**Effective date**

These Subject-Specific Provisions shall become effective on the day following official publication by Universität Hamburg. They shall apply to students commencing their studies in Winter Semester 2019/20.

Hamburg, 20 June 2019  
**Universität Hamburg**

Annex to the Subject-Specific Provisions for the Master of Science in Wood Science—Module Table

Key: L = Lecture;  
 FT = Field trip;  
 PC = Practical course;  
 Pr = Project

						Courses		Examinations					
Offered in	Recommended Semester	Duration (semesters)	Module Type: Required (Req.), Required Elective (RE), or Elective (E)	Module Prerequisites	Module Number/Code	Module	Course Name	Type of Course	Cr. Hrs.	Prerequisites for Admission to an Examination	Type of Examination	Graded	ECTS Credits
<b>Required modules for the MSc in Wood Science</b>													
Winter semester	1	1	Req.	None	MWS01	<b>Characteristics and Grading of Wood</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Wood Characteristics, Grading and Implications for Use		L	1				
						Case Studies and Field Trips on Grading of Wood		S	1				
						Grading of Sawn Wood		L	1				
						Laboratory Visual & Mechanical Grading Methods		S	1				
<b>Intended learning objectives:</b> Students will learn about relationships of wood properties and the criteria for quality (round timber, sawn timber, and wood products) and will be able to verify changes and application options.													
Winter semester	1	1	Req.	None	MWS02	<b>Usage of Timber—Environmental and Economic Impacts</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Basics about the Usage of Bioresources		L	2				
						Life Cycle Assessment		L	1				
						Project Work on Potential Impacts		Pr	1				
<b>Intended learning objectives:</b> Students will demonstrate strategies for assessing the sustainability of renewable resources and will be able to evaluate the aspects of economic, ecological, and social interactions. They will become familiar with technology impact analysis.													
Winter semester	1	1	Req.	None	MWS03	<b>Project Management</b>					<b>Conclusion of the project</b>	<b>No</b>	<b>6</b>
						Theory of Project Management		L	1				
						Seminar Project Exercises		S	2				
						Field Trips		FT	1				
<b>Intended learning objectives:</b> Students will learn how to plan and carry out projects. They will carry out their own projects as a team and take a field trip. They will become familiar with time and cost management methods and will be able to work on projects involving different social groups.													
Winter semester	1	1	Req.	None	MW 04	<b>Fibers and Fiber-Based Products</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Fibers and Fiber-Based Products		L	3				
						Seminar about Fibers and Fiber-Based Products		S	1				
<b>Intended learning objectives:</b> Students will be familiarized with morphological, chemical, and physical properties of hardwood, softwood, and yearling plant fibers. Moreover, students will acquire knowledge about the potential application of fibers for composite products such as paper, boards, fiberboards, and wood-plastic composite materials.													
Winter semester	1	1	Req.	None	MWS-Fund	<b>Fundamentals of Management</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Required elective course		L	2				
						Required elective course		PC	1				
Generally, the module is comprised of the following required elective courses each with 6 ECTS credits, which are offered regularly:													
<ul style="list-style-type: none"> <li>• Introduction to CSR</li> <li>• International Strategic Management</li> <li>• International Organization</li> <li>• Management Accounting and Control</li> <li>• International Market Strategies</li> <li>• Finance and Investment</li> <li>• Sustainability and Management</li> </ul>													
Students must successfully complete 1 required elective course.													

**Annex to the Subject-Specific Provisions for the Master of Science in Wood Science—Module Table**

Key: L = Lecture;  
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 Pr = Project

							Courses		Examinations				
Offered in	Recommended Semester	Duration (semesters)	Module Type: Required (Req.), Required Elective (RE), or Elective (E)	Module Prerequisites	Module Number/ Code	Module	Course Name	Type of Course	Cr. Hrs.	Prerequisites for Admission to an Examination	Type of Examination	Graded	ECTS Credits
<p><b>Intended learning objectives:</b> The aim of the module is to familiarize students with management and sustainability issues in an entrepreneurial context. Students will be in a position to theoretically and practically understand central management issues and to independently work and critically reflect on these issues. Furthermore, students will become familiar with the challenges and problems of sustainable management in order to be able to understand the business and economic relationships in detail and be able to work and critically reflect on the resulting conflicts of objectives of organizations.</p>													
<b>Required elective modules for the the MSc in Wood Science</b>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS05</b>	<b>Wood Molecular Biology and Biotechnology</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Wood Molecular Biology and Biotechnology		L	2				
						Wood Molecular Biology and Biotechnology		Pr	2				
<p><b>Intended learning objectives:</b> Students will receive sound knowledge of the importance of molecular and biotechnological methods in the wood sciences. They will learn to successfully apply methods to account for and establish proof of legality for the movement of timber. Students will acquire genetic engineering skills for the production and creation of enhanced wood for optimal use.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS06</b>	<b>Wood Degradation and Protection</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Wood Degradation and Protection		L	2				
						Wood Degradation and Protection		Pr	2				
<p><b>Intended learning objectives:</b> Students will learn modern methods of wood biology, which will enable them to critically consider issues about wood damage and preservation and to develop suitable propositions for solutions.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS07</b>	<b>Wood Physiology and Biochemistry</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Wood Physiology and Biochemistry		L	2				
						Wood Physiology and Biochemistry		Pr	2				
<p><b>Intended learning objectives:</b> Students will acquire sound knowledge of wood physiological and wood biochemical metabolic processes with a particular focus on wood and heartwood formation. They will learn about modern wood-biological research and examination methods on functional genomics, proteomics, or metabolomics.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS08</b>	<b>Paper and Board Technology</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Paper and Board Technology		L	2				
						Development of Paper and Board Production		Pr	2				
<p><b>Intended learning objectives:</b> Students will have a solid understanding of the various production processes and products of the paper and cardboard industry. They will learn the differences between the technologies used for graphic paper, tissue paper, specialty paper, cardboard, and corrugated paperboard. Students will also learn about and understand the significance of recycled paper as a fibrous raw material and the recycling techniques used for various finished products.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS09</b>	<b>Lignocellulose Biorefinery</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Lignocellulose Biorefineries		L	3				
						Lignocellulose Biorefineries		Pr	1				
<p><b>Intended learning objectives:</b> Students will acquire in-depth knowledge about the conversion of lignocellulosic raw materials such as wood, straw, and bagasse into liquid energy sources and commodity chemicals. This knowledge includes thermo-chemical conversion processes and technologies based on pretreatment and enzymatic hydrolysis for the production of fermentable sugars and lignin. Students will also have gained an understanding of the economic and ecological aspects of biorefinery processes.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS10</b>	<b>Biopolymers</b>					<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Biopolymers from Lignocellulosics		L	3				
						Biopolymers from Lignocellulosics		Pr	1				

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Offered in	Recommended Semester	Duration (semesters)	Module Type: Required (Req.), Required Elective (RE), or Elective (E)	Module Prerequisites	Module Number/ Code	Courses			Examinations				
						Module	Course Name	Type of Course Cr. Hrs.	Prerequisites for Admission to an Examination	Type of Examination	Graded	ECTS Credits	
<p><b>Intended learning objectives:</b> Students will have a solid understanding of the extraction of wood components for the production of high-quality polymers and polymer derivatives. Students will learn about the processes of isolation and purification based on the chemical properties of the wood components. Different strategies for the derivatization of polymers and for the production of new materials and substances will be covered. The problems arising from the distinctiveness of bio-based raw materials is an important aspect of this.</p>													
Summer semester	2 or 3	1	Req.	None	<b>MWS11</b>	<b>Solid Wood Technology</b>				<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>	
						Solid Wood Technology	L	2					
						Solid Wood Technology	Pr	2					
<p><b>Intended learning objectives:</b> Students will learn the detailed processing methods for solid wood. They will be able to evaluate the relationships between processing, conditions of use, and product performance.</p>													
Winter semester	2 or 3	1	Req.	None	<b>MWS12</b>	<b>Composite Technology</b>				<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>	
						Composite Technology	L	2					
						Composite Technology	Pr	2					
<p><b>Intended learning objectives:</b> Students will learn about the special topics of composites made from renewable raw materials. They will create their own materials, which they themselves will produce, test, and evaluate.</p>													
Summer or winter semester	2 or 3	1	Req.	None	<b>MWS13</b>	<b>Structural Application of Wood</b>				<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>	
						Structural Application of Wood	L	2					
						Structural Application of Wood	Pr	2					
<p><b>Intended learning objectives:</b> Students will learn about requirements for building materials and become familiar with the most important European rules and regulations. They will learn basic regulatory building codes. Students will be able to characterize the effects that using timber and wood composites in load-bearing structures will have. They will be able to perform simple calculations, for example, regarding the moisture and thermal behavior of building components.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS14</b>	<b>Timber Production</b>				<b>Presentation</b>	<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>
						Principles of Timber Production	L	2					
						Seminar about Decisions for Sustainable Forest Management	S	2					
<p><b>Intended learning objectives:</b> Students will learn about the most fundamental decisions that forest managers make regarding forest management for wood production.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS15</b>	<b>International Forestry and Timber Industries</b>				<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>	
						International Forestry	L	2					
						Seminar Forest Zones (regional focus)	S	2					
<p><b>Intended learning objectives:</b> Students will understand the regional characteristics of the forest and timber industry in a global context and learn about international policy instruments, initiatives, and conventions that affect the forest and timber industry.</p>													
Summer or winter semester	2 or 3	1	RE	None	<b>MWS16</b>	<b>Data Sources and Modeling Timber-Related Industries</b>				<b>Oral or written examination</b>	<b>Yes</b>	<b>6</b>	
						Statistical Terminology, Classification and Data Sources	L	2					
						Seminar Modeling Resource Markets	S	2					
<p><b>Intended learning objectives:</b> Students will become familiar with national and international data collection / data sources for wood resources, supply and demand for wood, and wood products. They will learn about the various approaches to evaluate material flows and will be able to apply them.</p>													
Summer or winter semester	3	1	RE	None	<b>MWS-M1125</b>	<b>Bioresources and Biorefineries</b>				<b>Written examination</b>	<b>Yes</b>	<b>6</b>	

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							Courses			Examinations			
Offered in	Recommended Semester	Duration (semesters)	Module Type: Required (Req.), Required Elective (RE), or Elective (E)	Module Prerequisites	Module Number/ Code	Module	Course Name	Type of Course	Cr. Hrs.	Prerequisites for Admission to an Examination	Type of Examination	Graded	ECTS Credits
						Biorefinery Technology		L	2				
						Exercise Bioresources Technology		PC	1				
						Bioresources Management		L	2				
						Exercise Bioresources Management		PC	1				
<p><b>Intended learning objectives:</b> Students will gain a broad understanding of the entire value chain for bio-based products. This includes the ecological, social, and economic impacts from both a micro and macro bioeconomic perspective. Students will learn about the interrelationships and interdependencies of the various channels of use for biomass.</p>													
Summer or winter semester	3	1	RE	None	MWS-M0543	<b>Management, Organization and Human Resource Management</b>					Written examination	Yes	6
						Management, Organization and Human Resource Management		L	2				
						Seminar Management, Organization and Human Resource Management		S	2				
<p><b>Intended learning objectives:</b> Students will be able to</p> <ul style="list-style-type: none"> <li>• explain organizational structures and strategies in an international or global environment;</li> <li>• describe the need for changes in the organizational structure of businesses, design new strategies, and identify the needs of employees in competitive situations; and</li> <li>• describe management structures and derive new structures to secure business resources and profitability.</li> </ul> <p>They will be able to</p> <ul style="list-style-type: none"> <li>• explain the significance of human resource management in multinational companies as it relates to corporate structures and corporate strategies;</li> <li>• illustrate staff recruitment and talent management for national and international companies; and</li> <li>• describe models and methods for the development of staffing requirements (e.g., predictive models, linear programming, and neural networks).</li> </ul>													
Summer or winter semester	2 or 3	1	RE	None	MWS17	<b>Project Study</b>					Conclusion of the project	Yes	6
<p><b>Intended learning objectives:</b> Students will work on a scientific topic theoretically and/or experimentally. They will be in a position to be able to evaluate their results in an interdisciplinary manner.</p>													
<b>Final Module</b>													
Summer semester	4	1	Req.	72 ECTS credits and the successful completion of the required modules	MWS-AB	<b>Final Module</b>					Final thesis	Yes	30
						Master's Thesis					Written thesis (95%) Presentation (5%)		
<p><b>Intended learning objectives:</b> The commencement of independent scholarly work, exemplary immersion into a subfield of wood science, knowledge of the rules of good scientific practice as well as knowledge of important publications and theories from this area of specialization.</p>													