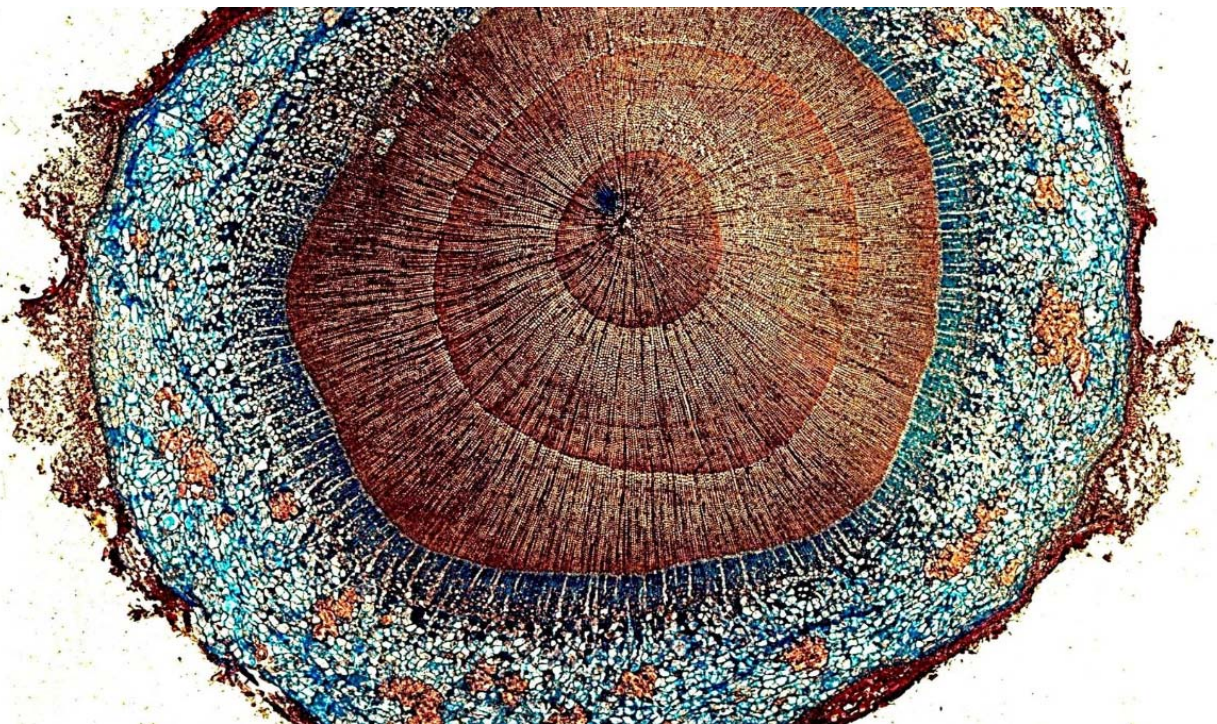


Module handbook

Bachelor of Science Bio-Resource Management



Study goal

As a result of the bachelor's program Bio-Resource Management the graduates have acquired comprehensive and theoretical knowledge as well as methodological knowledge and skills in the interdisciplinary topic of using the resource wood and other lignocelluloses such as palm, bamboo and straw.

The graduates have an overview of the most important topics from the cultivation of the lignocelluloses up to their use and understand the basic functions of the materials including the processing technology and the effects on nature and society.

Furthermore, the graduates have extensive knowledge of scientific, technological and economic fundamentals. They have internalized the "rules of good scientific work" and have professional and social skills.

In addition, they have economic and socio-economic skills to use the scientific and technological knowledge in the bioeconomy.



Bachelor of Science Bio-Resource Management – Overview

WT1	Introduction wood technology	Introduction forestry and wood economics	Fundamentals of biology	Introductory module business administration	Experimental physics	Fundamentals of mathematics	
SST1	Scientific work	Applied statistics	botany	Cost theory	Foundations of chemistry and small chemical internship		
WT2	Chemistry of renewable resources	Construction and materials		Building materials	Technical mechanics	Environmental engineering	
ST2	Chemical technology of renewable resources		Physics of renewable resources		Global aspects of wood use	Nature sustainability of wood use	Environmental review
WT3		Physical process technology of renewable	Biology of renewable resources			Wood trade and wood markets	
ST3	Final module (bachelor thesis)		External internship		Elective modules		



University Hamburg



general vocational skills



Elective modules



Cooperation with Hamburg University of Technology and Hafencity University Hamburg



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1 Introduction wood technology

Module name	Introduction wood technology				
Module number	BRN01				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. Jörg Ressel / Tel. 040-73962-604 / E-Mail joerg.ressel@uni-hamburg.de				
Lecturer	Prof. Dr. Jörg Ressel, Prof. Dr. Andreas Krause, PD Dr. Jürgen Odermatt, Dr. Jan Lüdtke (TI/HF)				
Language	German				
Learning outcomes	Students know basic aspects of the technology of using wood and other renewable resources. They have basic knowledge in the context of the raw material to the final product. The students are aware of the variety of technological aspects of the use and exploitation of renewable resources.				
Content	Fundamentals of Technological Use of Wood and Other renewable resources <ul style="list-style-type: none"> • Basic technological features of renewable resources • Use of solid wood (extraction, processing) • Use of composites • Use of fibers and raw materials 				
Course type	<ul style="list-style-type: none"> • Lecture Introduction wood technology • Exercise on wood technology 				3 (s.hrs) 1 (s.hrs)
Workload (overall and for each course type)		ECTS	P (hrs)	S (hrs)	PV (hrs)
	<ul style="list-style-type: none"> • Lecture Introduction wood technology • Exercises on wood technology 		42 14	54 40	30
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of exam: written exam (graded, 100%)				
Duration	One term				
Frequency	Annual				
Literature	Will be announced at the beginning of the course				

2 Introduction forestry and wood economics

Module name	Introduction forestry and wood economics					
Module number	BRN02					
Term	Winter term					
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module					
Requirements for participation	None					
Module responsible	Prof. Dr. Michael Köhl, Tel. 040-73962100, E-Mail weltforstwirtschaft@uni-hamburg.de					
Lecturer	Prof. Dr. Michael Köhl, Dr. Philip Mundhenk, N.N.					
Language	German					
Learning outcomes	The students are familiar with the forestry production processes, gain an overview of the economic Utilisation of the raw material wood and have a basic understanding of the structures and branches of the forestry and wood industry in different regions of the world					
Content	<p><i>General</i> The fundamentals of wood production, wood processing and value creation along the forestry-wood chain as well as the understanding of the economic and social significance of the forestry and timber industry will be conveyed.</p> <p><i>Forestry</i> Global forest resources, timber production, structure and legal forms of forestry operations, mono- and polycyclic forestry, legal and social frameworks, sustainability, multiple functions.</p> <p><i>Timber industry</i> Wood industry and wood trade, raw materials and products of the timber industry</p>					
Course type	<ul style="list-style-type: none"> • V Forestry economics • Ü Forestry and wood economics 				1 (s.hrs) 1 (s.hrs)	
Workload (overall and for each course type)	<ul style="list-style-type: none"> • V Forestry economics • Ü Forestry and wood economics 		ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort		3	90		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of examination / module examination (if necessary partial examinations) Oral or written module final exam (graded, 100%). Type of exam will be announced at the beginning of the event.					
Duration	One term					
Frequency	Annual					
Literature	Will be announced at the beginning of the course					

3 Fundamentals of biology - focus on botany

Module name	Fundamentals of biology - focus on botany				
Module number	BRN03				
Term	Winter- and summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. Elisabeth Magel, Tel.: 040-73962-403, E-Mail: elisabeth.magel@uni-hamburg.de				
Lecturer	Prof. Dr. Jörg Fromm; Prof. Dr. Elisabeth Magel				
Language	German				
Learning outcomes	Students have basic knowledge of botany, the morphology and anatomy of renewable resources, as well as practical skills in the preparation and light microscopy of botanical objects.				
Content	The module teaches the anatomical and morphological foundations of growing resources. Students learn about the structure of the plant cell up to complex tissues and organs (shoot axis, root, leaf, flower, fruit and seeds) of the plant. You acquire basic knowledge about the structure / construction-function relationships of plant tissue. In addition, the ability to recognize and identify important renewable resources based on external, morphological characteristics is acquired. Of particular importance is the teaching of basic dendrological knowledge of native coniferous and deciduous trees as well as the practice of relevant non-European tree species.				
Course type	<ul style="list-style-type: none"> • V Fundamentals of biology - focus on botany • V Morphology of the renewable resources (with dendrology) • Ü Exercises Anatomy of renewable resources 				2 (s.hrs) 2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)		ECTS	P (hrs)	S(hrs)	PV (hrs)
	<ul style="list-style-type: none"> • V Fundamentals of biology - focus on botany • V Morphology of the renewable resources (with dendrology) • Ü Exercises Anatomy of renewable resources 		28	47	45
	Total effort	9	270		
Examination requirements and examination mode	Admission to the partial module examinations: None. Type of examination / module examination (if necessary partial examinations): Two partial examinations (examinations, 1/3 and 2/3). The lecture "Basics of Biology with focus on Botany" and the Exercise "Anatomy of the renewable resources" will be examined together (2/3 of the grade).				
Duration	Two terms				
Frequency	Annual				
Literature	Will be announced at the beginning of the course				

4 Introductory module business administration (UHH)

Module name	Introductory module business administration				
Module number	23-11-1.bwl				
Term	Winter term				
Usability, module type and assignment to the curriculum	Bachelor Degree Program Social Economics, BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	N.N.				
Lecturer	N.N.				
Language	German				
Learning outcomes	The module should introduce the basic categories and processes of business problem areas and decision processes. In doing so, the focus will be on business cognition objects and evaluation tools in theoretical analysis and more practice-oriented application. The students are taught comprehensive business administration knowledge. Interdisciplinary interdependencies of economics, law and sociology are always considered. The aim of the course is to enable students to make decisions and solve problems from a business perspective.				
Content	The module introduces students to the history and sub-disciplines of general business administration. It deals with decision-making processes of corporate management and strategic management as well as problem solving of sub-disciplines. Specifically, the determination of formal goals of the company and the conflict relations with stakeholders are analyzed before the individual disciplines Marketing, Materials Management and Production, Accounting, financing and investment personnel, organization and management are drafted.				
Course type	<ul style="list-style-type: none"> Lecture à 2 (s.hrs) and exercise à 2 (s.hrs) 				4 (s.hrs)
Workload (overall and for each course type)		ECTS	P (hrs)	S(hrs)	PV (hrs)
	<ul style="list-style-type: none"> Lecture à 2 (s.hrs) exercise à 2 (s.hrs) 	3	28	32	30
	Total effort	6	180		
Examination requirements and examinationmode	The module is completed with a module exam in the form of an exam within the framework of the respective lecture. The examination language is German.				
Duration	One term				
Frequency	Each term				
Literature	Will be announced at the beginning of the courses				



5 Experimental physics (UHH)

Module name	Experimental physics				
Module number	PHY-B-04				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. Torsten Uphues / Tel.: 040-42838-2726 / E-Mail: thorsten.uphues@cfel.de				
Lecturer	Prof. Dr. Torsten Uphues / Fachbereich Physik / MIN / UHH				
Language	German				
Learning outcomes	The students know the basics of general physics and the relevant contexts that they can apply in solving everyday problems.				
Content	Experimental physics: Introduction to mechanics, thermodynamics, electrostatics, electric current, magneto statics, temporally variable fields, electromagnetic waves, geometric optics, wave optics, radiation of black bodies, atomic physics, nuclear physics				
Course type	<ul style="list-style-type: none"> Lecture Experimental physics Exercise Experimental physics 				3 (s.hrs) 1 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Experimental physics Exercise Experimental physics 	ECTS	P (hrs)	S (hrs)	PV (hrs)
			42	56	40
	Total effort	6	180		
Examination requirements and examination mode	Prerequisites to register for the module exam: Regular participation in the exercises Examination / module examination (if necessary partial examinations): written exam (graded, 100%)				
Duration	One term				
Frequency	annual				
Literature	The bibliography will be published at the beginning of the lecture and is usually in the lecture script.				

6 Fundamentals of mathematics (UHH)

Module name	Fundamentals of mathematics				
Module number	MATH-HOWI-A2				
Term	Winter- und summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Dr. Peter Christian Heinig, Tel.: +49 40 42838-5138, E-Mail: peter.heinig@math.uni-hamburg.de				
Lecturer	Dr. Peter Christian Heinig				
Language	German				
Learning outcomes	Students have basic knowledge of elementary analysis and elementary linear algebra.				
Content	Essentially, basic analysis takes into account the knowledge of the functions of a variable (sequences, series, limits, functions and continuity, trigonometric functions, exponential function, logarithm, differential calculus, curve discussion, integral calculus, Newton's method). In addition, basic concepts for functions of several variables (partial derivatives, local extrema) and simple examples of differential equations are treated on a small scale. In addition, the module deals with linear systems of equations, the Gaussian elimination algorithm, matrices, determinants, n-dim. real vector space and the Euclidean scalar product.				
Course type	<ul style="list-style-type: none"> Lecture Elementary analysis (Maths 1) Lecture Elementary linear algebra (Maths 2) 				2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Elementary analysis (Maths 1) Lecture Elementary linear algebra (Maths 2) 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of examination / module examination (if necessary partial examinations): Two partial examinations (weighting 50% each)				
Duration	two terms				
Frequency	annual				

7 Scientific work

Module name	Scientific work				
Module number	BRN04				
Term	summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Dr. Katrin Schwarz, Tel. 040-73962-505, E-Mail katrin.schwarz@uni-hamburg.de				
Lecturer	Dr. K. Schwarz				
Language	German				
Learning outcomes	The students know the rules for securing good scientific practice of the DFG and understand their ethical significance. They are able to formulate hypotheses and research questions. Literature can be researched and evaluated in important databases. The basic structure of experimental research was understood. The principles of scientific publications can be applied.				
Content	<ul style="list-style-type: none"> Rules to ensure good scientific practice of the DFG (2013) Search in scientific literature databases Scientific writing Structure and construction of experimental research 				
Course type	<ul style="list-style-type: none"> Lecture ethics & research Experiments - from design to paper 				2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture ethics & research Experiments - from design to paper 	ECTS	P (hrs) 28 28	S(hrs) 55 33	PV (hrs) 36
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of examination / module examination (if necessary partial examinations): completion of the course (graded, 100%).				
Duration	One term				
Frequency	Annual				
Literature	Will be announced at the beginning of the courses				

8 Applied statistics

Module name	Applied statistics				
Module number	BRN05				
Term	summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. Michael Köhl, Tel.: 040-73962100, E-Mail: weltforstwirtschaft@uni-hamburg.de				
Lecturer	Prof. Dr. Michael Köhl, Dr. Philip Mundhenk				
Language	German				
Learning outcomes	The students are familiar with the methods for descriptive and closing statistics. They master the statistical methods of experimental design and empirical surveys				
Content	The module introduces the basics of probability calculus and statistics. Knowledge of descriptive and confirmatory statistics, in particular mathematical-statistical methods of experimental design, sample inventories, statistical decision techniques, distributions, statistical test methods, regression and variance analysis methods will be taught.				
Course type	<ul style="list-style-type: none"> Lecture Applied statistics Excercise Applied statistics 				1 (s.hrs) 1 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Applied atistics Excercise Applied statistics 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	3	90		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of examination / module examination (if necessary partial examinations): Oral or written module final examination (graded, 100%); Type of exam will be announced at the beginning of the event.				
Duration	one term				
Frequency	annual				
Literature	Bortz & Schuster, Statistik für Human- und Sozialwissenschaftler, Springer, 2010 Hedderich&Sachs, Angewandte Statistik: Methodensammlung mit R, Springer, 2015 Zar, Biostatistical Analysis, Pearson, 2009 Sieberts, van Bebber & Hochkirschen, Statistische Versuchsplanung: Design of Experiments, Springer, 2010				

9 Cost theory (UHH)

Module name	Cost theory				
Module number	23-12a-Kos				
Term	summer term				
Usability, module type and assignment to the curriculum	Bachelor Degree Program Social Economics, BSc Bio-Resource Management compulsory module				
Requirements for participation	Introductory Module Business Administration				
Module responsible	N.N.				
Lecturer	N.N.				
Language	German				
Learning outcomes	The aim of the module is to understand the structure of cost accounting and their systems. In addition, students should be familiar with the application requirements for these systems as well as use cost accounting and their systems as the basis for assessments and decisions in companies.				
Content	<p>The module covers the following topics:</p> <ul style="list-style-type: none"> • Procedure of cost element, cost center and cost unit item and time calculation, each based on full cost accounting; • partial cost accounting with its possible applications, for example in the contribution margin calculation; • Comparison of actual and planned costs, u. a. using the result deviation analysis; • Outlook on the basics of cost management. 				
Course type	<ul style="list-style-type: none"> • Lecture cost theory 				4 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture cost theory 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	56	62	62
Examination requirements and examination mode	<p>Requirements to register for the module exam None</p> <p>Type of examination / module examination (if necessary partial examinations): written exam (graded, 100%)</p>				
Duration	One term.				
Frequency	annual				
Literature	<p>Adolf G. Coenenberg/Thomas M. Fischer/Thomas Günther (2012) Kostenrechnung und Kostenanalyse. 8., überarbeitete Auflage. Schäffer Poeschel, Stuttgart.</p> <p>Lothar Haberstock (2008) Kostenrechnung I – Einführung – mit Fragen, Aufgaben, einer Fallstudie und Lösungen. 13., neu bearbeitete Auflage. Erich Schmidt Verlag, Berlin.</p>				

10 Foundations of chemistry and small chemical internship (UHH)

Module name	Foundations of chemistry and small chemical internship				
Module number	CHE-82 B				
Term	summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	PD Dr. Christoph Wutz, Tel.: 040 42838-6004, E-Mail: christoph.wutz@desy.de				
Lecturer	PD Dr. Christoph Wutz, Dr. Ulrich Riederer				
Language	German oder Englisch, i.d.R. German				
Learning outcomes	The students understand the basic principles of general, inorganic and organic chemistry as well as chemical working in the laboratory. The knowledge acquired in the pre-reading will be deepened in the exercises and applied during the internship:				
Content	Foundations of inorganic and organic chemistry: atomic structure, chemical bonds, physical properties of matter, chemical Reaction, chemical analysis, acid bases, salts, redox reactions, Nomenclature, properties and reactions of organic compounds, natural products, plastics				
Course type	<ul style="list-style-type: none"> Lecture foundations of chemistry Excercise foundations of chemistry Small Chemical Internship 				3 (s.hrs) 1 (s.hrs) 3 (s.hrs)
Workload (overall and for each course type)		ECTS	P (hrs)	S(hrs)	PV (hrs)
	<ul style="list-style-type: none"> Lecture foundations of chemistry Excercise foundations of chemistry Small chemical Internship 		42	74	19
			13	23	9
			49	26	15
	Total effort	9	270		
Examination requirements and examination mode	Requirements for the module examination: for TP 1: None for TP 2: passed TP 1 Regular participation in the lecture and exercise is recommended. Type of module examination: TP 1: written exam (graded, 100%) TP 2: Internship (b / nb) During the safety briefing and the internship there is a compulsory attendance				
Duration	One term				
Frequency	Annual				
Literature	Will be announced at the beginning of the courses				

11 Chemistry of renewable resources

Module name	Chemistry of renewable resources				
Module number	BRN06				
Term	summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	PD Dr. Jürgen Odermatt, Tel. 040-73962-528, E-Mail juergen.odermatt@uni-hamburg.de				
Lecturer	PD Dr. Jürgen Odermatt				
Language	German				
Learning outcomes	The students have basic knowledge of the chemical properties of the raw materials, their importance to the processes in which they are incorporated and the products that are produced from them.				
Content	<p>Lignocelluloses as a composite polymer. Chemistry and biochemistry of lignocellulosic builders carbohydrate and cellulose chemistry, hemicellulosic and lignin chemistry; Biochemistry of lignification.</p> <p>Other important components of renewable resources and their classification, such as starch, fats and others. Connections of structure and properties of different classes of compounds, technological importance, use and characterization.</p> <p>Specific applications and aspects of renewable resources chemistry such as e.g. Surface chemistry, thermal and photochemical aging.</p> <p>Interdisciplinary Relationships with Cross References to Biology and Physics of the renewable resources.</p>				
Course type	<ul style="list-style-type: none"> V Chemistry of renewable resources 				4 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> V Chemistry of renewable resources 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (if necessary partial examinations) written exam (graded, 100%)				
Duration	One term				
Frequency	annual				
Literature	Will be announced at the beginning of the courses				

12 Construction and materials

Module name	Construction and materials				
Module number	BRN07				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. A. Krause, Tel. +494073962623, E-Mail andreas.krause@uni-hamburg.de				
Lecturer	N.N. / Dr. R. Lehnen (TI/HF)				
Language	German				
Learning outcomes	<p>The students are able to correctly recognize and interpret the content of technical drawings as well as to make even simple technical drawings, projections and sketches of objects and components.</p> <p>They have basic knowledge of the composition and properties of non-renewable organic materials (thermoplastics and thermosets).</p>				
Content	<ul style="list-style-type: none"> • Technical drawing (reading, understanding and self-drawing drawings) • Using Cadworks (3D CAD / CAM software in timber construction) • Thermosetting adhesives • thermoplastics • coatings 				
Course type	<ul style="list-style-type: none"> • Lecture Polymers, adhesives & coatings • Lecture and exercise construction 				2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture Polymers, adhesives & coatings • Lecture and exercise construction 	ECTS	P (hrs)	S(hrs)	PV (hrs)
			28	42	20
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (if necessary partial examinations): Two partial examinations (50% each)				
Duration	One term				
Frequency	annual				
Literature	Will be announced at the beginning of the courses				

13 Physics of renewable resources

Module name	Physics of renewable resources	
Module number	BRN08	
Term	Winter- und summer term	
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module	
Requirements for participation	The successful completion of the modules Mathematics, Experimental Physics, Fundamentals of Chemistry, Foundations of Biology is strongly recommended	
Module responsible	Prof. Dr. Jörg Ressel / Tel. 040-73962-604 / E-Mail joerg.ressel@uni-hamburg.de	
Lecturer	Prof. Dr. Jörg Ressel, Prof. Dr. Andreas Krause, Dr. M. Ohlmeyer (TI/HF)	
Language	German	
Learning outcomes	The students master the basics of the physical and elastomechanical properties of renewable resources as well as composites made from them. You have knowledge of the complex interactions between the material properties and the use of the material. In addition, they have a certainty in the proper and safe use of products from renewable resources and they know the limits of material use and their usability. Furthermore, they know about the performance of products made from renewable raw materials.	
Content	<ul style="list-style-type: none"> • Physical and elastomechanical properties of renewable resources and derived products. • Methods for standard-compliant, empirical determination of properties / characteristic values • Physical material properties Raw density, moisture content, moisture movement, moisture-related dimensional changes, thermal properties, electrical properties, acoustic properties, pairs of friction, influencing factors and dependencies, opportunities and limits of material use. • Elastomechanical properties elasticity theory, elastic characteristics of orthotropic material behavior, static, dynamic and rheological behavior. • Strength theory tensile, compressive, bending, buckling, shear and torsional strength, impact resistance, duration fatigue strength, hardness, wear resistance 	
Course type	<ul style="list-style-type: none"> • Lecture Physics of renewable resources I (SoSe) • Seminar Physics of renewable resources (WiSe) • Lecture Physics of renewable resources II (WiSe) • Seminar Physics of renewable resources (SoSe) 	3 (s.hrs) 1 (s.hrs) 1 (s.hrs) 1 (s.hrs)

Workload (overall and for each course type)		ECTS	P (hrs)	S (hrs)	PV (hrs)
	<ul style="list-style-type: none"> Lecture Physics of renewable resources I (SoSe) Seminar Physics of renewable resources (WiSe) Lecture Physics of renewable resources II (WiSe) Seminar Physics of renewable resources (SoSe) 		42	63	60
	Total effort	9	270		
Examination requirements and examination mode	Requirements to register for the module exam None Type of Examination: Module Examination written exam (graded, 100%)				
Duration	Two terms				
Frequency	annual				
Literature	<p>Niemz P, Sonderegger W (2017). Holzphysik Physik des Holzes und der Holzwerkstoffe. München Carl Hanser. 580 S. ISBN 978-3-446-44526-0</p> <p>Desch H E, Dinwoodie J M (1996). Timber its structure, properties and Utilisation (No. Ed. 7). MacMillan Press Ltd. 307 pp</p> <p>Sandberg D, Navi P (2007). Introduction to thermo-hydro-mechanical (THM) wood processing. Växjö Universitet. 126 pp</p> <p>Keylwerth, R. (1951). Die anisotrope Elastizität des Holzes und der Lagenhölzer. VDI-Forschungsheft 430.</p>				

14 Building materials (HCU)

Module name	Building materials				
Module number	BIW-B -Mod-104				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr.-Ing. G. Kapteina, Tel. 040 42827 4074, E-Mail gesa.kapteina@hcu-hamburg.de				
Lecturer	Prof. Dr.-Ing. G. Kapteina				
Language	German				
Learning outcomes	<p>The students have</p> <ul style="list-style-type: none"> • Basic knowledge of building materials with regard to their composition, structure, production, processing, mechanical and moisture and heat-technical properties, as well as the material-specific damage processes • Knowledge of metrological methods for the determination of the characteristic material properties during material testing • Knowledge of construction regulations. <p>The abovementioned knowledge enables the critical selection of building materials and, if necessary, of building material combinations in terms of their viability and suitability for use, taking into account the conditions of exposure and the building regulations.</p>				
Content	<ul style="list-style-type: none"> • Technical regulations • Structure of the materials Forming and strength characteristics, physical parameters, measuring technology, non-destructive testing methods, • Metals, metallurgical fundamentals, manufacturing, properties, types and marking, welding, corrosion behavior and corrosion protection • wood and wood-based materials, • plastics, bitumen, glass 				
Course type	<ul style="list-style-type: none"> • Lecture Building materials 				4 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture Building materials 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of exam / module exam Written exam (graded, 100%)				
Duration	One term				
Frequency	annual				
Literature	Will be announced at the beginning of the courses				

15 Technical mechanics (TUHH)

Module name	Technical mechanics				
Module number	M0569				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr.-Ing. Uwe Weltin, Tel.: +49 40 428783005, E-Mail: weltin@tuhh.de				
Lecturer	Prof. Dr.-Ing. Uwe Weltin				
Language	German				
Learning outcomes	The student can name basic connections, theories and methods for calculating the forces in statically determined systems of rigid bodies and basics of elastostatics. The student can apply theories and methods for calculating the forces in statically determined systems of rigid bodies and foundations of elastostatics. The student can work solution-oriented in heterogeneous small groups and learns and deepens the mutual help. The student is able to independently solve tasks from this course.				
Content	Apply methods for calculating the forces in statically determined systems of rigid bodies such as rigid bodies. Newton-Euler method, energy methods. Fundamentals of elasticity including forces and deformations in elastic systems of metallic and ceramic materials (iron, steel, non-ferrous metals, ceramic) as well as composite materials.				
Course type	<ul style="list-style-type: none"> Lecture Technical mechanics I Excercise Technical mechanics I 				3 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Technical mechanics I Excercise Technical mechanics I 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	42 28	21 54	25 10
Examination requirements and examination mode	Requirements to register for the module exam: None Module exam written exam (graded, 100%)				
Duration	One term				
Frequency	Annual				
Literature	Will be announced at the beginning of the courses				



16 Environmental engineering (TUHH)

Module name	Environmental engineering				
Module number	M1275				
Term	Winter- und summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	Basic knowledge of inorganic. and organ. Chemistry and biology are recommended				
Module responsible	Dr. Joachim Gerth / Tel. 040-42878-2701 / E-Mail gerth@tuhh.de				
Lecturer	Dr. Joachim Gerth, Dr. Anne Rödl, Dr. Christoph Balzer, Prof. Dr. Martin Kaltschmitt / IUE / TUHH				
Language	German und Englisch				
Learning outcomes	<p>Upon completion of this module, students acquire in-depth knowledge of environmental engineering. They are able to fundamentally describe the behavior of substances in the environment. The students can give an overview of the scientific disciplines involved. You can explain terms and assign them to the corresponding methods. The students are able to suggest suitable measures for the management and mitigation of environmental problems. They can determine geochemical parameters and assess the potential for shifting and transforming toxic substances in the environment. Students are able to formulate independently informed opinions on how environmental technology contributes to sustainable development and to present and defend this opinion in front of the group. The students are able to discuss technical and scientific tasks subject-specific and interdisciplinary. They are able to jointly develop different solutions and to advise on their theoretical and practical implementation. The students can independently tap into sources about the subject, familiarize themselves with the knowledge contained therein and transfer it to new questions.</p>				
Content	<p>Environmental engineering</p> <ul style="list-style-type: none"> • Introductory lecture in environmental sciences • Environmental effects and harmful effects • Wastewater Technology • Luftrecontung • Noise • Waste / Recycling • groundwater protection / soil protection • Renewable energy • Resource conservation and energy efficiency 				
Course type	<ul style="list-style-type: none"> • Lecture Environmental engineering (WiSe) • Laboratory Internship environmental engineering (SoSe) 			2 (s.hrs)	1 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture Environmental engineering 	ECTS	P (hrs) 28 14	S (hrs) 20 10	PV (hrs) 18



	(winter term) • Laboratory Internship environmental engineering (summer term)				
	Total effort	3	90		
Examination requirements and examination mode	Prerequisites to register for the module exam - participation in the internship Type of exam: written exam (graded, 100%)				
Duration	Two terms				
Frequency	Annual				
Literature	F. Scheffer und P. Schachtschabel (2002) "Lehrbuch der Bodenkunde" TUB Signatur AGG-308 W.E.H. Blum (2007) "Bodenkunde in Stichworten" TUB Signatur AGG-317				



17 Environmental review (TUHH)

Module name	Environmental review
Module number	M1274
Term	summer term
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module
Requirements for participation	Basic knowledge of inorganic. and organ. Chemistry and biology are recommended
Module responsible	Prof. Dr. Martin Kaltschmitt / E-Mail kaltschmitt@tuhh.de
Lecturer	Prof. Dr. Martin Kaltschmitt
Language	German und Englisch
Learning outcomes	<p>By completing this module, students acquire in-depth knowledge of important cause-and-effect relationships for potential environmental problems that can arise through production processes, projects, or construction. They have knowledge of the variety of methods and are competent in dealing with various methods and instruments for the evaluation of environmental impacts or environmental damage. Furthermore, students are able to assess the complexity of these environmental processes as well as uncertainties and difficulties in their measurement and assessment. From the variety of assessment methods, students can select a methodology that best suits their application and can develop appropriate management and mitigation measures for realworld business or planning environmental issues. They are able to carry out a life cycle assessment independently and can also use the software programs OpenLCA and the database Ecolnvent. On completion of the event, students also have the ability to critically address environmental impact outcomes due to their extensive knowledge. They can better judge research results or other publications of various media to assess environmental impacts and form their own opinions. The students are able to discuss technical and scientific tasks subject-specific and interdisciplinary. They are able to jointly develop different solutions and to discuss their theoretical and practical implementation. Through the imparting of the topics in the course of the entire lecture series, the students gain insight into the complex issues of environmental protection and the sustainability idea. Their sensitivity and awareness of these issues are sharpened and help to become aware of their later social responsibility as engineers. Self-employment Students learn how to independently research, prepare and present a problem to an audience. By independently working on the tasks, the students are enabled to work independently, ie. to research, prepare and report results. Furthermore, they can independently solve a real planning or entrepreneurial problem. They have a better judgment over results of similar studies, as they are e.g. Influence possibilities by certain parameter assumptions on own example got to know</p>
Content	Environmental review <ul style="list-style-type: none">• pollutants load and risk analysis• Environmental damage & precautionary principle Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA)



	<ul style="list-style-type: none"> • Raw material and water consumption mass flow analysis • Energy consumption Cumulative energy expenditure (CEC), cost analyzes • Life Cycle Concept Life Cycle Assessment • Sustainability product line analysis, SEE balance • Management Environmental and Sustainability Management Systems (EMAS) • Complex systems MCDA, scenario method 				
Course type	<ul style="list-style-type: none"> • Lecture Environmental review • Exercise Environmental review 				2 (s.hrs) 1 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture Environmental review • Exercise Environmental review 	ECTS	P (hrs)	S (hrs)	PV (hrs)
		2	28	20	18
		1	14	10	
	Total effort	6	90		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of Examination: written exam (graded, 100%).				
Duration	Two terms				
Frequency	annual				
Literature	Will be announced at the beginning of the event				

18 Chemical technology of renewable resources

Module name	Chemical technology of renewable resources				
Module number	BRN09				
Term	Winter- and summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. Bodo Saake, Tel. 040-73962-510, E-Mail bodo.saake@uni-hamburg.de				
Lecturer	Dr. Jürgen Odermatt, Prof. Dr. Bodo Saake, Dr. Katrin Schwarz				
Language	German				
Learning outcomes	Students have a basic knowledge of the technology of pulp production and use. This accounts for the influence of various raw materials (wood species and various annual plants) on the final products. In addition, students are familiar with the technological and qualitative differences between the most important processes for the production of various pulps and the processing of waste paper. By successfully completing the seminar, they have acquired in-depth knowledge of key processes and can associate them with product features and use them for property enhancements.				
Content	The module deals with the topics of treatment of wood and annual plants, raw material influence, pulp production, pulp production from wood and annual plants, use of other fiber plants (eg flax, hemp, cotton), chemical recovery and power plant, waste paper recycling, paper and paperboard production, environmental aspects , In the seminar, the knowledge of the students-the theoretical and practical deepened and linked. Digestion processes are treated on a variety of raw materials and compared with flotation deinking of waste paper as the main fiber production process. The lignin-removing bleach is treated on the pulp and the lignin-containing bleach on the deinked waste paper. In the seminar, the students will develop in working groups solutions to questions of the mentioned topics and implement them experimentally; The results are presented, discussed and compared.				
Course type	<ul style="list-style-type: none"> Lecture Chemical technology of renewable resources (summer term) Seminar Chemical technology of renewable resources (winter term) 			4 (s.hrs)	4 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Chemical technology of renewable resources (summer term) Seminar Chemical technology of renewable resources (winter term) 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	12	360		
Examination requirements and examination mode	Requirements to register for the module exam: None Type of examination / module examination (if necessary partial examinations): Exam (graded, 100%) and a homework (passed).				
Duration	Two terms				
Frequency	annual				



Literature	Will be announced at the beginning of the courses
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19 Physical process technology of renewable resources

Module name	Physical process technology of renewable resources				
Module number	BRN10				
Term	Winter- and summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	None				
Module responsible	Prof. Dr. A. Krause, Tel. 040 73962-623, E-Mail andreas.krause@uni-hamburg.de				
Lecturer	Prof. Dr. A. Krause, Dr. M. Ohlmeyer (TI/HF)				
Language	German				
Learning outcomes	Die Studierenden kennen die wichtigsten Be- und Verarbeitungsprozesse nachwachsender Rohstoffe. Sie können die Eigenschaften der Rohstoffe mit den Anforderungen der Prozesse und Werkstoffe in Beziehung setzen. Sie kennen die wichtigsten Be- und Verarbeitungsparameter bei der Transformation nachwachsender Rohstoffe in Halb- und Fertigwaren.				
Content	Die wichtigsten Produktionsprozesse zur Herstellung von Halb- und Fertigwaren, ihre Vor- und Nachteile (Rohstoffeffizienz, Ausbeute, Einsatzmöglichkeiten des Rohstoffs, Ansätze zur Herstellung von Produkten unter Berücksichtigung von Investitions- und Produktionskosten) werden an Beispielen aus der Holzindustrie vermittelt. Gliederung der Lehrveranstaltung in <ul style="list-style-type: none"> • Säge- und Hobelwerkstechnik • Trocknung und Dämpfen von Schnittholz • Herstellung von Holzwerkstoffen • Materialcharakterisierung von Holz und Holzwerkstoffen 				
Course type	<ul style="list-style-type: none"> • Lecture Physical process technology of renewable resources (winter term) • Seminar Physical process technology of renewable resources (summer term) 			4 (s.hrs)	2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • Lecture Physical process technology of renewable resources (winter term) • Seminar Physical process technology of renewable resources (summer term) 	ECTS	P (hrs)	S(hrs)	PV (hrs)
			56	84	40
		28	42	20	
	Total effort	9	270		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (possibly partial examinations) <ul style="list-style-type: none"> • Physical process technology of renewable resources exam (75%) • Seminar on the physics of renewable resources Practical training (protocol, 25%) 				
Duration	Two terms				
Frequency	annual				
Literature	Will be announced at the beginning of the courses				

20 Biology of renewable resources

Module name	Biology of renewable resources					
Module number	BRN11					
Term	Winter- und summer term					
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module					
Requirements for participation	The successful completion of the BSc module "Fundamentals of Biology - Focus on Botany" is strongly recommended					
Module responsible	Prof. Dr. Elisabeth Magel, Tel. 040-73962-403, E-Mail elisabeth.magel@uni-hamburg.de					
Lecturer	Prof. Dr. Jörg Fromm; Prof. Dr. Elisabeth Magel, PD Dr. G. Koch (TI/HF), Dr. J. Trautner (TI/HF), Dr. E. Melcher (TI/HF)					
Language	German					
Learning outcomes	<p>Upon successful completion of the module, students have basic knowledge of the biology of trees and other lignified plants (e.g., bambus, palms). In addition, they can distinguish the most important wood-related, native and exotic types of wood - theoretically and practically (macroscopically).</p> <p>The students know the most important harmful organisms (fungi, insects, etc.) and their damage patterns of renewable lignocellulose-containing raw materials. They are familiar with basic constructive, chemical and biological methods for the protection of renewable resources and can also evaluate measures under technological, normative and economic aspects.</p>					
Content	<p>The basics of biology and the growth of renewable resources are communicated. The focus is on wood formation and the formation of timber characteristics. These are deepened by wood biology exercises. The students gain theoretical and practical knowledge about the currently important commercial and trading timber as well as other lignified single- and multi-annual plants (for example bamboo, palm trees). In addition, basic knowledge about fungal and animal damage (pests, damage, avoidance) of renewable raw materials is communicated. The module also deals with the topic of protection of renewable resources with a focus on wood preservation. Of particular importance is the recognition of biological / chemical / physiological / technological and economic relationships of renewable resources.</p>					
Course type	<ul style="list-style-type: none"> • Lecture General biology of renewable resources • Lecture + exercise General biology of renewable resources • Seminar + exercise renewable resources and their pests 			2 (s.hrs)	2 (s.hrs)	2 (s.hrs)
Workload (overall and for each course type)		ECTS	P (hrs)	S(hrs)	PV (hrs)	
	<ul style="list-style-type: none"> • L General biology of renewable resources • L+E General biology of renewable resources • S+E renewable resources and their pests 		28	45	10	
	Total effort	9	270			
Examination requirements and examination mode	<p>Prerequisites to register for the module exam Regular participation in the exercises on Applied Biology of renewable resources and renewable resources and their pests</p> <p>Type of examination / module examination (if necessary partial examinations) oral</p>					



	examination or written examination (graded, 100%); Type of exam will be announced at the beginning of the event.
Duration	two terms
Frequency	annual
Literature	Will be announced at the beginning of the courses

21 Global aspects of wood use

Module name	Global aspects of wood use				
Module number	BRN12				
Term	Winter- und summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	The successful completion of the module "Introduction of forestry and timber industry" is strongly recommended				
Module responsible	Prof. Dr. Michael Köhl, Tel. 040-73962100, E-Mail weltforstwirtschaft@uni-hamburg.de				
Lecturer	Prof. Dr. Michael Köhl, Dr. Philip Mundhenk, N.N.				
Language	German				
Learning outcomes	The students have in-depth knowledge of the origin and availability of the renewable raw material wood, as part of a sustainable forestry production - global and regional geographic differentiated. They can assess problem areas and conflict areas that exist with regard to the different interests and requirements of forest management and are to be solved in a region-specific manner, taking into account economic, ecological and social aspects. They know about approaches to certification of sustainable forest management and verification of legality.				
Content	<ul style="list-style-type: none"> • Dissemination, composition and change of global forest resources • Questions of international forestry and wood industry • Deforestation, forest degradation, afforestation • Land use conflicts • Sustainable multifunctional forest management • Certification systems (PEFC, FSC, ISO) • Legality verification systems 				
Course type	<ul style="list-style-type: none"> • Lecture Global aspects of wood use • Exercise Global aspects of wood use 				2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • L Global aspects of wood use • E Global aspects of wood use 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (if necessary partial examinations) Oral or written module final exam (graded, 100%); Type of exam will be announced at the beginning of the event.				
Duration	Two terms				
Frequency	annual				
Literature	Will be announced at the beginning of the courses				



22 Naturale sustainability of wood use

Module name	Naturale sustainability of wood use				
Module number	BRN13				
Term	summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	The successful completion of the module "Introduction of forestry and timber industry" is strongly recommended				
Module responsible	Prof. Dr. Michael Köhl, Tel. 040-73962100, E-Mail weltforstwirtschaft@uni-hamburg.de				
Lecturer	Prof. Dr. Michael Köhl, Dr. Philip Mundhenk, N.N.				
Language	<i>German</i>				
Learning outcomes	The students are familiar with fundamental aspects of forestry production, including silvicultural systems and methods for the derivation of the sustainable set of cuts. You can classify forestry production into the overall concept of multifunctionality of forests. They also know the basics of timber harvesting and logistics				
Content	<ul style="list-style-type: none"> • Silvicultural systems of the temperate latitudes and the tropics • Forest growth, growth of trees and stands • Forest Inventory • Forest functions, ecosystem services • Derivation of sustainable heath rate • Framework conditions of forestry • Technical and organizational basics of timber harvesting and logistics • Business aspects of forest management 				
Course type	<ul style="list-style-type: none"> • Lecture Naturale sustainability of wood use • Exercise Naturale sustainability of wood use 				2 (s.hrs) 2 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> • L Naturale sustainability of wood use • E Naturale sustainability of wood use 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (if necessary partial examinations) Oral or written module final exam (graded, 100%); Type of exam will be announced at the beginning of the event.				
Duration	One term				
Frequency	annual				
Literature	Röhring, Bartsch & von Lüpke, Waldbau auf ökologischer Grundlage, UTB, 2006 Von Gadow, Forsteinrichtung Analyse und Entwurf der Waldentwicklung, Universitätsverlag Göttingen, 2005 Köhl, Magnussen & Marchetti, Sampling Methods, Remote Sensing and GIS Multiresource Forest Inventory, Springer, 2006				

23 Wood trade and wood markets

Module name	Wood trade and wood markets				
Module number	BRN14				
Term	Winter term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	The successful completion of the module "Introduction of forestry and timber industry" is strongly recommended				
Module responsible	Prof. Dr. Michael Köhl, Tel. 040-73962100, E-Mail weltforstwirtschaft@uni-hamburg.de				
Lecturer	Prof. Dr. Michael Köhl, PD Dr. Marcus Knauf, Dr. Philip Mundhenk, N.N.				
Language	<i>German</i>				
Learning outcomes	Timber and wood markets include forest wood, waste wood / waste paper, semi-finished goods and finished goods. Students master the rules of wood sorting, understand the practices of the national and international timber trade and are familiar with national and global markets in terms of market structures, trade volumes and prices.				
Content	Sorting of wood Introduction to national, European and international regulations for dimension and use related wood sorting Timber Trade Types and Categories of Trade, Business, Supply and Payment Terms, International Commercial Law and Trade Terms, Chain of Custody Certification, Proof of Legality, Wood Markets Overview Markets for renewable and non-renewable raw materials, environmental and resource economics, theory of non-regenerable and regenerable natural resources, theoretical foundations of market theory (consumer choice, theory of business, market and price theory), foreign trade theory, international wood markets including timber and wood demand analysis,				
Course type	<ul style="list-style-type: none"> Lecture Wood trade and wood markets Exercise Wood trade and wood markets 			3 (s.hrs)	1 (s.hrs)
Workload (overall and for each course type)	<ul style="list-style-type: none"> Lecture Wood trade and wood markets Exercise Wood trade and wood markets 	ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort	6	180		
Examination requirements and examination mode	Requirements to register for the module exam None Type of examination / module examination (if necessary partial examinations) Oral or written module final exam (graded, 100%); Type of exam will be announced at the beginning of the event.				
Duration	One term				
Frequency	annual				
Literature	Rahmenvereinbarung für den Rohholzhandel in Germanland (RVR); Schmitthüsen, et al, Unternehmerisches Handeln in der Wald- und Holzwirtschaft, 2015				

24 External internship

Module name	External internship					
Module number	BRN15					
Term	Winter- and summer term					
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module					
Requirements for participation	None					
Module responsible	Prof. Dr. Elisabeth Magel, Tel. 040-73962-403, E-Mail elisabeth.magel@uni-hamburg.de					
Lecturer	All lecturers of the institute for wood sciences					
Language	Depending on company, internships abroad possible.					
Learning outcomes	The students got acquainted with their future occupational field. They have made themselves a first contact with companies in the timber industry and were able to apply and supplement the knowledge acquired during their studies. Through their internships, the students have an understanding of the social structure of companies and of the interaction of organizational units. For the trainee, self-experience as a member of the social community of a company is also important.					
Content	The internship should provide a first, general insight into the working life, contact with the material wood, products made from it and the appropriate processing and processing as well as business contexts. The concrete content-related requirements for the trainees arise from the practice of the company in which the internship is completed.					
Course type	<ul style="list-style-type: none"> External internship Seminar External internship 				2 (s.hrs)	
Workload (overall and for each course type)	<ul style="list-style-type: none"> External internship Seminar External internship 		ECTS	P (hrs)	S(hrs)	PV (hrs)
	Total effort		9	270		
Examination requirements and examination mode	<i>Requirements to register for the module exam None</i> Type of examination / module examination (if necessary partial examinations) Internships (passed). Trainees must prepare weekly work reports during their internship. The apprenticing company issues an internship certificate to the trainee, indicating the duration of the apprenticeship and the duration of the training as well as the number of days off. Proof of the completed internships must be submitted at the latest with proof of the passed final examination for the Bachelor.					
Duration	8 weeks in whole or in part for at least two weeks; Recognized only full weeks.					
Frequency	Block event in one of the lecture-free times. As a rule, students choose their internship position themselves.					

25 Final module (bachelor thesis)

Module name	Final module (bachelor thesis)				
Module number	BRN-AB				
Term	Winter- and summer term				
Usability, module type and assignment to the curriculum	BSc Bio-Resource Management, compulsory module				
Requirements for participation	Advanced knowledge of bioresource use, proven by 100 credits.				
Module responsible	All lecturers of the institute for wood sciences				
Lecturer	All lecturers of the institute for wood sciences				
Language	German and English				
Learning outcomes	The students got an introduction to independent scientific work and the exemplary deepening of a sub-field of bioresource-use in theory and practice. They know the rules of good scientific practice, and they know important publications and theories of the specialty.				
Content	In-depth study of a current or fundamental topic of bioresource use in the working group of a university lecturer with experimental design, drawing up a work plan and if necessary revising it with project progress, literature research (in the library and on the internet), learning the subject-specific methodology, documentation and (statistical) evaluation of the data, evaluation of the results, critical discussion in comparison to scientific publications and lectures.				
Course type					
Workload (overall and for each course type)		ECTS	P (hrs)	S(hrs)	PV (hrs)
	<ul style="list-style-type: none"> • Bachelor thesis • Colloquium 				
	Total effort	12	360 shares P / S depending on the bachelor thesis		
Examination requirements and examination mode	<p><i>Requirements to register for the module exam None</i></p> <p>Type of examination / module examination (if necessary partial examinations): written examination (10/12) and an oral examination (2/12, colloquium). The colloquium should be held no later than six weeks after completion of the written work (corresponds to § 14 paragraph 10 PO B. Sc. Of the correction time). The bachelor thesis can be written in german or english language. The bachelor thesis is to be preceded by a summary in English and German language.</p>				
Duration	One term				
Frequency	Each term				
Literature	depending on the topic of the bachelor thesis				