

Handbook of modules for the study course Sustainable Agriculture, B.Sc.

May 2026

valid for all students enrolled
from WS 2026/27 onwards

The most important details

Duration:	7 semesters full-time, 9 semesters part-time
Location:	Kleve
Qualification:	Bachelor of Arts, B.A.
Course start:	Annually in the winter term
Language:	English
Internship/ study abroad:	in the 6th semester
Bachelor thesis:	in the second half of the 7th semester (full time) in the 9 th semester (part time)
Calculation of workload:	1 CP equals 30 hours per semester
Examinations:	all examination types as detailed in §14, 17–20 General Examination Regulations for Bachelor Degree Programmes
Literature:	Literature mentioned in the module descriptions are first recommendations and do not replace the syllabus of the module. The module coordinators assume as a rule that the titles specified always refer to the most current version.
Attendance:	Attendance of all lab courses, seminars and exercises marked * is mandatory, attendance of all seminars and exercises is recommended.

**This programme is
accredited by**

Curriculum Sustainable Agriculture, B.Sc.

Module Code	Modules	Module Requirements	CH	Type						Exam graded	attestation	ECTS points*	CH								
				L	S	E	LC	Pro	WT 1				ST 2	WT 3	ST 4	WT 5	ST 6	WT 7			
SA 1 4802	Sustainable Learning - Learning Sustainability		3	1	1	1				P	T	5	3								*
SA 1 4804	Principles of Economics		4	1	1	2				P		5	4								
SA 1 4805	Analysis and Interpretation of Data I		4	2		2				P		5	4								
SA 1 4807	Basics of Biology and Agroecology		5	2	1		2			P	T	5	5								*
SA 1 4808	Agricultural Engineering I and Energy Use in Agriculture		4	2		2				P		5	4								
SA 1 4809	Agricultural Chemistry		4	2			2			P	T	5	4								*
SA 1 4810	Soil Science		6	3		1	2			P	T	5	2	4							*
SA 2 4811	Biology and Biodiversity		4	2			2			P	T	5		4							*
SA 2 4825	Agricultural Economics and Farm Management		4	1	1	2				P		5		4							
SA 2 4827	Organic and Biochemistry, Biotechnology		4	2			2			P	T	5		4							*
SA 2 4828	Agricultural Engineering II and Agrotechnology		4	2		2				P		5		4							
SA 2 4837	Basics of Animal Anatomy, Physiology and Nutrition		4	2	1		1			P	T	5		4							*
SA 3 4841	International Markets, Trade and Agricultural Policy		4	1	3					P	T	5			4						*
SA 3 4845	Analysis and Interpretation of Data II		4	2		2				P		5			4						
SA 3 4847	Climate Change and Water Management		4	4						P		5			4						
SA 3 4848	Crop Physiology and Nutrition		5	3			2			P	T	5				5					*
SA 3 4850	Animal Husbandry and Health		4	2	0,5		1,5			P	T	5			4						*
SA 3 4862	Crop Health and Agrobiodiversity		4	2		2				P		5			4						
SA 4 4824	Rural Development and Sustainable Behaviour		4	1	2	1				P	T	5				4					*
SA 4 4874	Project		4					4			T	5				4					
SA 4 4876	Horticulture and Agroforestry		5	3			2			P	T	5				5					*
SA 4 4883	Sustainable Land Use Systems		4	2	1	1				P		5				4					
	Elective modules		24									30				8	8				8
SA 5 4844	Natural Resources and Environmental Economics		4	1	1	2				P		5					4				
SA 5 4921	Ethics in Life Sciences		3	1	2					P		5					3				
SA 5 4922	Sustainability and Agri-food Chains		4	1		1		2		P		5					4				
SA 5 4925	Animal Welfare		4	2		2				P		5					4				
SA 6 4991	Internship or Study Abroad	min. 90 ECTS points **									T	30								X	
SA 7 4993	Bachelor Thesis	min. 180 ECTS points								P		12									X
SA 7 4994	Colloquium	207 ECTS points								P		3									X
SA 7 4995	Applied Excursions										T	5									X
	total credit hours		131	47	14,5	23	16,5	6				210	26	24	25	25	23				8
												ECTS points	30	30	30	30	30	30			30
															150						60
																					210

	total	1.Sem	2.Sem	3.Sem	4.Sem	5.Sem	6.Sem	7.Sem
CH	131	26	24	25	25	23		8
ECTS points	210	30	30	30	30	30	30	30

Abbreviations:

- CH = credit hours per week
- E = exercise
- ECTS points = European Credit Transfer System of Credit Points
- L = Lecture
- LC = lab course
- P = examination (graded)
- Pro = project
- S = seminar
- ST = summer term
- T = attestation (passed)
- WT = winter term

* ECTS points are only credited after all module parts have been successfully completed.
 ** In addition to the General Examination Regulations for Bachelor's Degree Programmes regarding the admission to the internship or study abroad the student has to show the successful completion of all modules/module examinations of the first study year of the study programme.

Module Code	Elective modules		Type						Exam graded	Exam attestation	ETCS points	CH		
			L	S	E	LC	Pro	ST				WT		
SA 4 4911	Organic Farming		4	1	2	1			P		5	4		
SA 4 4912	Phytomedicine		4				4		P	T	5	4		*
SA 4 4913	Applied Animal Husbandry and Feeding Systems		4	1	2	1			P		5	4		
SA 4 4914	Innovative solutions for Sustainable Land Use		4		2			2	P		5	4		
SA 4 4915	Education for Sustainable Development		4	1	2	1			P		5	4		
SA 4 4021	Strategy and Management		4	1	2	1			P		5	4		*
SA 4 4023	Financial Accounting		4	1	1	2			P		5	4		
SA 4 4026	Supply Chain Management		4	1	1	2			P		5	4		
SA 4 4072	Entrepreneurship and Innovation Management		4	2	1	1			P		5	4		
SA 4 4073	Market Research		4	1	1	2			P		5	4		
SA 5 4963	Soil Ecology		4				4		P		5		4	
SA 5 4964	Sustainability and Herd Health in Livestock Farming		4	1	2	1			P		5		4	
SA 5 4965	Ecological and Bioeconomic Modelling		4		2	2			P		5		4	
SA 5 4966	Environmental Protection and Renewable Energy		4	2	1	1			P		5		4	
SA 5 4968	Plant Environmental Biochemistry		4					4	P	T	5		4	*
SA 5 4001	Marketing		4	2		2			P		5		4	
SA 5 4018	Extention and Communication		4	2	1	1			P	T	5		4	*
SA 5 4042	Quality of Plant and Animal Products		4	2		2			P		5		4	
SA 5 4043	Environmental, Agricultural and Food Law		4	2	2				P		5		4	
SA 5 4046	Management Accounting		4	1	1	2			P		5		4	
SA 5 4123	Food Processing and Human Nutrition		4	2			2		P	T	5		4	*
SA 5 4124	Integrated Management Systems		4	1	1	2			P		5		4	
SA 7 4971	Project reg. Academic Principles and Methods in preparation of Bachelor Thesis		8							T	10		8	
SA 7 550	Language Course		4							T	5		4	***
SA 4 WPF_1	Module from any other Bachelor Study Course at Faculty of Life Sciences at Rhine-Waal University of Applied Sciences		4						P		5	4		***
SA 5 WPF_2	Module from any other Bachelor Study Course at Faculty of Life Sciences at Rhine-Waal University of Applied Sciences		4						P		5		4	***
SA 7 WPF_3	Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences		4						P		5		4	***
SA 7 WPF_4	Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences		4						P		5		4	***
5-6 elective modules amount to			24								30			

The faculty reserves the right to determine a minimum number of participants for offering an elective subject. Admission to mandatory modules is subject to available capacities. The possibility to obtain the required number of credit points remains unaffected.

In case of new developments in the different fields of Sustainable Agriculture the faculty reserves the right to expand the range of elective modules by further study courses over the time.

*** The actual selection from any study programme of the Rhine-Waal University has to be approved by the Examination Committee of the Faculty of Life Sciences. Module code and module description of the module chosen will be used.

Assessment Methods for Sustainable Agriculture, B.Sc.

Module Code	Modules	Exam		
		graded	attestation	
SA 1 4802	Sustainable Learning - Learning Sustainability	written exam, 120 minutes	attestation for seminar and exercise	*
SA 1 4804	Principles of Economics	written exam, 120 minutes		
SA 1 4805	Analysis and Interpretation of Data I	1. written exam, 120 minutes (80%) 2. assignment (20%)		
SA 1 4807	Basics of Biology and Agroecology	written exam, 120 minutes	attestation for lab course	*
SA 1 4808	Agricultural Engineering I and Energy Use in Agriculture	written exam, 120 minutes		
SA 1 4809	Agricultural Chemistry	written exam, 120 minutes	attestation for lab course	*
SA 1 4810	Soil science	written exam, 120 minutes	attestation for lab course	*
SA 2 4811	Biology and Biodiversity	written exam, 120 minutes	attestation for lab course	*
SA 2 4825	Agricultural Economics and Farm Management	1. written exam, 120 minutes (80%) 2. report (20%)		
SA 2 4827	Organic and Biochemistry, Biotechnology	written exam, 120 minutes	attestation for lab course	*
SA 2 4828	Agricultural Engineering II and Agrotechnology	written exam, 120 minutes		
SA 2 4837	Basics of Animal Anatomy, Physiology and Nutrition	written exam, 120 minutes	attestation for lab course	*
SA 3 4841	International Markets, Trade and Agricultural Policy	1. written exam, 120 minutes (80%) 2. report and presentation (20%)	attestation for seminar and exercise	*
SA 3 4845	Analysis and Interpretation of Data II	written exam, 120 minutes		
SA 3 4847	Climate Change and Water Management	assignments		
SA 3 4848	Crop Physiology and Nutrition	written exam, 120 minutes	attestation for lab course	*
SA 3 4850	Animal Husbandry I and Health	written exam, 120 minutes	attestation for lab course	*
SA 3 4862	Crop Health and Agrobiodiversity	written exam, 120 minutes		
SA 4 4824	Rural Development and Sustainable Behaviour	1. written exam, 60 minutes 2. project paper and presentation	attestation for seminar and exercise	*
SA 4 4874	Project		attestation for project work, depending on project chosen	
SA 4 4876	Horticulture and Agroforestry	written exam, 120 minutes	attestation for lab course	*
SA 4 4883	Sustainable Land Use Systems	1. written exam, 90 minutes (70%) 2. assignment (30%)		
SA 4 4911	Organic Farming	1. written exam, 120 minutes (70%) 2. assignments (30%)		elective
SA 4 4912	Phytomedicine	1. written exam, 60 minutes 2. paper	attestation for lab course	* elective
SA 4 4913	Applied Animal Husbandry and Feeding Systems	1. written exam, 90 minutes (60%) 2. presentation (25%) 3. written assignments (15%)		elective
SA 4 4914	Innovative solutions for Sustainable Land Use	1. project report (30%) 2. presentation (20%) 3. written exam (60 minutes) (50%)		elective
SA 4 4915	Education for Sustainable Development	1. Practical and written assignments (70%) 2. Oral presentation (30%)		elective
SA 4 4021	Strategy and Management	written exam, 120 minutes	attestation for seminar and exercise	* elective
SA 4 4023	Financial Accounting	written exam, 120 minutes		elective
SA 4 4026	Supply Chain Management	written exam, 120 minutes		elective
SA 4 4072	Entrepreneurship and Innovation Management	1. paper (50%) 2. presentation/oral exam (50%)		elective
SA 4 4073	Market Research	1. written exam, 90 minutes 2. report / presentation		elective
SA 4 WPF_1	Module from any other Bachelor Study Course at Faculty of Life Sciences at Rhine-Waal University of Applied Sciences	depends on module chosen		*** elective

SA 5 4844	Natural Resources and Environmental Economics	written exam, 120 minutes		
SA 5 4921	Ethics in Life Sciences	assignments		
SA 5 4922	Sustainability and Agri-food Chains	1. written exam, 60 minutes 2. report/presentation		
SA 5 4925	Animal Welfare	1. written exam, 90 minutes (60%) 2. semester projects (40%)		
SA 5 4963	Soil Ecology	paper, as pdf via email		elective
SA 5 4964	Sustainability and Herd Health in Livestock Farming	1. written exam, 90 minutes (60%) 2. presentation (25%) 3. written assignments (15%)		elective
SA 5 4965	Ecological and Bioeconomic Modelling	1. written exam, 60 minutes 2. assignment in coding		elective
SA 5 4966	Environmental Protection and Renewable Energy	written exam, 120 minutes		elective
SA 5 4968	Plant Environmental Biochemistry	1. project report (30%) 2. presentation (20%) 3. written exam (60 minutes) (50%)		* elective
SA 5 4001	Marketing	1. written exam, 120 minutes 2. seminar paper		elective
SA 5 4018	Extension and Communication	1. written exam, 60 minutes 2. attestation from passed exercises	attestation for seminar and exercise	* elective
SA 5 4042	Quality of Plant and Animal Products	written exam, 120 minutes		elective
SA 5 4043	Environmental, Agricultural and Food Law	written exam, 120 minutes		elective
SA 5 4046	Management Accounting	written exam, 120 minutes		elective
SA 5 4123	Food Processing and Human Nutrition	written exam, 120 minutes	attestation for lab course	* elective
SA 5 4124	Integrated Management Systems	1. assignment 2. written exam, 120 minutes		elective
SA 5 WPF_2	Module from any other Bachelor Study Course at Faculty of Life Sciences at Rhine-Waal University of Applied Sciences	depends on module chosen		*** elective
SA 6 4991	Internship or Study Abroad		Internship: report Study abroad: 15 ECTS from foreign university, report to supervising professor	
SA 7 4971	Project reg. Academic Principles and Methods in preparation of Bachelor Thesis		depends on project chosen	elective
SA 7 550	Language Course		see the module description provided by the International Centre	*** elective
SA 7 WPF_3	Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences	depends on module chosen		*** elective
SA 7 WPF_4	Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences	depends on module chosen		*** elective
SA 7 4993	Bachelor Thesis	Thesis, generally comprising 40–100 pages		
SA 7 4994	Colloquium	oral examination, max. 45 minutes		
SA 7 4995	Applied Excursions		participation in a total of 100 hours excursions	

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SA 1 4802 Sustainable Learning – Learning Sustainability

AB 1 4002

Study Semester: 1 (full time)
1 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	50 h
Seminar	15 h	Preparation for exams	65 h
Excursion/Exercise	15 h		
Sum	45 h	Sum	105 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern, Dr. Conor Watson; NN

Teaching contents

Self Management and Learning: people and team skills; time management; presentation skills; giving and receiving feedback; academic reading and academic writing

Sustainability: Definitions, concepts and dimensions of sustainability and sustainable development; stakeholders and driving forces; introduction to methods of sustainability assessment (e.g. footprints, LCA); introduction to sustainability management, auditing, labelling and control systems (e.g. EMAS, ISO, Codex Alimentarius); multi-, inter- and transdisciplinarity; basics of land use and supply chain systems; sustainable agroecosystems

Learning objectives

On successful completion of this module, students should

- know the relevant terms, definitions, concepts and dimensions of sustainability and sustainable development, with special emphasis on their relevance in agriculture¹
- know how to succeed at university¹
- be able to relate their knowledge about sustainability and sustainable development to agriculture and their own life²
- be able to apply methods of self, time and project management individually and in groups³
- be able to critically discuss the perspectives and shortcomings of sustainability approaches in agriculture⁵
- be able to evaluate their personal learning progress and identify their own learning needs⁵
- be able to consider the social impact of professional decisions^{2,3} and thus deepen their capacity to engage in society^{2,3}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgment

Teaching and learning methods

Seminar; self-study; group work; excursion; exercise; feedback

Entrance requirements

Mandatory: None

Recommended:

Reading list

Smale and Fowle: How to Succeed at University

Pears and Shields: Cite them right

Gliessman: Agroecology

Morse: Sustainability: A Biological Perspective

McIntyre et al. (eds.): International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD): Global Report

Examination in winter term 2026/27

graded exam: written exam, 120 minutes
certificate for "Self Management and Learning"

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; online tutorials; videos; video feedback

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence	X		

last amended: May 2026

SA 1 4004 Principles of Economics

AB 1 4804

study semester: 1 (full time)
1 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	30 h
Seminar	15 h	Literature review	30 h
Exercise	30 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Dr. Jana Lohmann

Teaching contents

Principles of microeconomics and macroeconomics; markets; supply and demand; welfare; consumer behaviour; firm behaviour; competition; public sector; economic growth; economic fluctuations; public policy

Learning objectives

On successful completion of this module, students should

- to be able to explain key principles of microeconomics and macroeconomics, including how markets function and how economic agents make decisions
- to be able to analyse the effects of supply and demand on prices and quantities in different market structures
- to be able to assess the efficiency and distributional outcomes of market activities and public policy using concepts of welfare economics
- to be able to interpret consumer and firm behaviour using foundational economic models
- to be able to apply standard analytical tools to evaluate macroeconomic issues such as economic growth, inflation, unemployment, and business cycles
- to be able to relate core economic concepts to real-world challenges in business management and public sector decision-making
- to be able to present economic reasoning and findings in a clear, structured, and academically appropriate format

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; exercises; group work and presentation

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Mankiw and Taylor: Economics

A. Barkley and P. W. Barkley: Principles of Agricultural Economics

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 1 4805 Analysis and Interpretation of Data I

AB 1 4005

study semester: 1 (full time)
1 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Exercise	30 h	Literature review	10 h
		Preparation for exams	40 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. PD Dr.-Ing. Sylvia Moenickes

Lecturers

Prof. Dr. Henrik Rudolf

Teaching contents

Mathematics 1: Calculus 1: review of elementary functions, differentiation and integration and their application;

Statistics 1: Descriptive statistics and data visualization; basics of probability theory and random variables; discrete and continuous distributions (binomial, hypergeometric, Poisson, uniform, normal, exponential, Weibull), central limit theorem, Gauss test, binomial test

Learning objectives

On successful completion of this module, students should

- know basic mathematical concepts and procedures, and their application^{1,2,3}
- be able to develop an exact way of thinking, working and wording as well as a feeling for numbers and the well-considered use of the calculator and RStudio^{2,3}
- be able to find and verify independent solutions^{3,4,5}
- be able to interpret mathematical formulas^{4,5}
- know basic statistical concepts and their application^{1,2,3}
- be able to recognize distributions from exemplary situations^{3,4}
- be able to calculate probabilities for different types of statistical questions^{3,4,5}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lectures; self-study; group work; exercise; feedback

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Milton: Head first data analysis

Stewart, Redlin und Watson: Algebra and Trigonometry

Stewart: Calculus – Early Transcendentals. Metric International Version

Stewart: Calculus

Strang: Linear Algebra and 1st Applications (see <http://www.mit.edu> -> OpenCourseWare)

Bulmer: Principles of Statistics

Simon and Blume: Mathematics for Economists

Examination in winter term 2026/27

graded exam: 1. written exam, 120 minutes (80%); 2. assignment (20%)

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 1 4807 Basics of Biology and Agroecology

AB 5 4007

Study Semester: 1 (full time)
3 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lectures	30 h	Preparation for contact time	25 h
Seminar	15 h	Literature review	20 h
Lab course/exercise	30 h	Preparation for exams	30 h
Sum	75 h	Sum	75 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach; Prof. Dr. Kerstin Koch

Teaching contents

Basic principles of Biology and Ecology: Basics, terms and concepts of cell biology (plant and animal cells and their components); fundamental genetics for breeding (molecular basis, inheritance, mutations, polyploidy); basics of zoology; terms, definitions, principles and concepts of ecology and agroecology; global cycles of matter; population and community ecology; foodwebs, habitat and niche; disturbance and succession

Application of biology to agriculture/agroecology: diversity and stability of agroecosystems; interactions in cropping systems; sustainable agroecosystems;

Lab course and greenhouse exercise: basics of biological and agroecological experimentation and data documentation; visualization of cellular components, microscopy and crop ecology; introduction to scientific working

Learning objectives

On successful completion of this module, students should

- know the relevant definitions, principles and concepts of cell biology, genetics and zoology¹
- know the relevant definitions, principles and concepts of ecology and their application in agriculture¹
- know how populations and communities of organisms in agroecosystems react to their environment¹
- be able to relate their knowledge in biology and ecology to its relevance in sustainable agriculture²
- be able to relate experimental observations to theory in biology and agroecology²
- be able to partly apply methods of biology and agroecology³
- be able to present and document results and findings in a scientifically appropriate format⁴
- be able to analyse how their findings are related to those of others⁴

- be able to evaluate the application of ecological principles and concepts in sustainable agricultural systems⁵
- be able to critically discuss possibilities and shortcomings of agroecology in the existing agricultural context⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursions; exercises; lab course

Entrance requirements

Mandatory: None

Recommended: None

Reading list

McGraw Hill: Biology

Alberts: Essential Cell Biology

Campbell and Reece: Biology

Reece, Urry, Cain, Wasserman, Minorsky, Jackson and Campbell: Biology

Gliessman: Agroecology

Odum, Brewer and Barrett: Fundamentals of Ecology

Callenbach: Ecology: A Pocket Guide

Various case studies and scientific publications

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration materials; laboratory and plant cultivation equipment

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence		X	

last amended: May 2026

Reading list

Tipler and Mosca: Physics for Scientists and Engineers Extended Version
Field and Solie: Introduction to Agricultural Engineering Technology: A Problem Solving Approach
American Society of Agricultural Engineers: CIGR Handbook of Agricultural Engineering

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 1 4809 Agricultural Chemistry

AB 5 4809

Study Semester: 1 (full time)
1 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	45 h
Lab course	30 h	Lab journal writing	20 h
		Preparation for exams	25 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Peter Scholz

Lecturers

Dr. Conor Watson; Dr. Stefan Weber

Teaching contents

Lecture:

Terms, definitions, principles and concepts of general chemistry; models of the atom; chemical bonding; chemical equilibrium; acids and bases; oxidation / reduction; processes affecting soil nutrients, loss of nutrients from agricultural soils

Lab course:

Practical experiments illustrating theories taught in lectures; fundamental lab skills including measuring and transferring solutions, titration, report writing, constructing standard graphs and using them to calculate nutrient concentrations

Learning objectives

On successful completion of this module, students should

- know the relevant definitions, principles and concepts of general and agricultural chemistry¹
- be able to apply chemical theories and terminology to scientific questions^{1,2}
- be able to conduct a simple experiment and to document the result¹⁻³
- be able to interpret experimental results within known chemical theories^{4,5}
- know important elements in agricultural sciences and their influence on farming^{1,2}
- know farming-relevant key processes in water and soil^{1,2}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab work with lab journal

Entrance requirements

Mandatory: None

Recommended:

Reading list

Corwin: Introductory chemistry

Hill, McCreary and Kolb: Chemistry for changing times

Pulford and Flowers: Environmental chemistry at a glance

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

certificate for lab course

Teaching materials and media

Beamer; white/black board; smart board; hand-outs; general lab equipment; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 1 4810 Soil Science

AB 5 4810

Study Semester: 1&2 (full time)
1&2 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	45 h	Preparation for contact time	20 h
Exercise	15 h	Literature review	10 h
Lab course/Field course	30 h	Preparation for exams	30 h
Sum	90 h	Sum	60 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern; Dr. Conor Watson

Teaching contents

Physical, chemical and biological properties of soils; terms and definitions of soil science; soil formation, classification and use; threats to and conservation of soil resources; relevance of soils for agricultural production; methods of soil analysis; methods of soil health appraisal; basics of soil tillage and influence on soil properties

Learning objectives

On successful completion of this module, students should

- know the relevant concepts of soil physics, soil chemistry and soil biology¹
- know how soils are formed, classified, function and can be protected¹
- be able to relate their knowledge about soils to its relevance in sustainable agriculture²
- be able to apply standard analytical lab procedures of soil science in experiments³
- be able to apply methods to assess soil fertility and health³
- be able to analyse and document results and findings in a scientifically appropriate form⁴
- be able to analyse how their data fit to the data of others⁴
- be able to evaluate the influence of different tillage systems on soil properties and determine their sustainability⁵
- be able to critically discuss options of sustainable soil use and soil health in an agricultural context⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab course with lab journal; field trip; excursion; feedback

Entrance requirements

Mandatory: None

Recommended: Agricultural chemistry (SA 1 4809)

Reading list

Weil and Brady: The Nature and Properties of Soils
Brady and Weil: Elements of the Nature and Properties of Soils
Scheffer and Schachtschabel: Soil Science
Grotzinger and Jordan: Understanding Earth
White: Principles and Practice of Soil Science

Examination in summer term 2027

graded exam: written exam, 120 minutes
certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 2 4811 Biology and Biodiversity

AB 4 4811

Study Semester: 2 (full time)
2 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Lab course/Field course	30 h	Literature review	20 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Kerstin Koch

Lecturers

Prof. Dr. Kerstin Koch

Teaching contents

Biology: fundamentals of anatomy and reproduction flowering and lower plants (Mosses, Lichen and Algae); human and animal parasites, basics in plant physiology (photosynthesis, plant hormones); functional plant anatomy; flow of water and nutrients; sensing and movement, fruit and seed anatomy and seed dispersal strategies; the origin of species and the driving forces of evolution; morphological adaptations in plants

Biodiversity: fundamentals of plant identification and classification of living organisms (hybrids, cultivars, wild plants), flowers and flower diagrams, invasive species; indicator plants; biodiversity and the CBD; Hot Spots of biodiversity; strategy types in nature conservation; biodiversity indices; Vavilov centres of diversity

Lab course: plant anatomy and species identification (flowering plants, fungi, algae), microscopy and specimen preparation, practice of biological experimentation and scientific data documentation

Learning objectives

On successful completion of this module, students should

- know the basics of plant and animal biology¹
- understand how plants and animal function and use resources and how this relates to strategies and diversity²
- apply their knowledge in the conduction and documentation of simple biological lab experiments³
- are able to identify plant species and analyse agricultural systems with respect to their influence and use of diversity⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; lab course

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Campbell and Reece: Biology

Reece, Urry, Cain, Wasserman, Minorsky, Jackson and Campbell: Biology

Stohlgren: Measuring Plant Diversity

Examination in summer term 2027

graded exam: written exam, 120 minutes

certificate for lab course

Teaching materials and media

Beamer; white/black board; handout; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 2 4825 Agricultural Economics and Farm Management

AB 2 4025

Study Semester: 2 (full time)
2 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	30 h
Seminar	15 h	Literature review	30 h
Exercise	30 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Risk management, futures and options as financial risk management instruments, commodity markets, drivers of commodity prices, market analysis, agricultural policy, welfare economics and analysis of agricultural policy on social welfare. Linear programming and optimization of farm production programs using graphical and numerical approaches as well as the simplex method applied in Excel Solver

Learning objectives

On successful completion of this module, students should

- be able to explain key economic concepts related to risk management, commodity markets, and agricultural policy, including the role of futures and options in hedging price risk²
- be able to describe the functioning and drivers of commodity markets and analyse their relevance for farm-level decision-making²
- be able to apply financial instruments such as futures and options in simulated trading environments using real market data to manage risk in agricultural production³
- be able to analyse the effects of agricultural policy instruments on market outcomes and social welfare using welfare economics frameworks⁴
- be able to evaluate alternative policy measures based on their efficiency, equity, and impact on agricultural markets and stakeholders⁴
- be able to develop optimized farm production plans using linear programming techniques (graphical, numerical, and Excel Solver-based) under different constraints and objectives³
- be able to interpret and communicate analytical results from simulations and optimization models to support strategic decision-making in agricultural management⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; discussions; class experiments; quizzes; trading competition; literature research and reporting; student presentations; graphical exercises on the analysis of the effects of agricultural policy; application of linear programming using on-paper methods and Excel Solver; self-study; group work

Entrance requirements

Mandatory: None

Recommended: Principles of Economics (SA 1 4804)

Reading list

Olson and Westra: The Economics of Farm Management – A Global Perspective
Norwood, Lusk, Peel and Riley: Agricultural Marketing and Price Analysis
Kay, Edwards and Duffy: Farm Management (international student edition)
Cramer, Jensen and Dewitt Southgate: Agricultural Economics and Agribusiness

Examination in summer term 2027

graded exam: written exam, 120 minutes (80%); 2. report (20%)

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; A/V media; online platforms for quizzes and experiments

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

Study Semester:	2 (full time) 4 (part time)	Credit Points (ECTS):	5
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Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	45 h
Lab course	30 h	Lab journal writing	20 h
		Preparation for exams	25 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Dr. Stefan Weber; Dr. Nadine Merettig; Prof. Dr. Natalie Laibach

Teaching contents

Lecture:

Terms, definitions, principles and concepts of organic, bio and food chemistry; important functional groups; common reaction types; reaction mechanisms; important biomolecules: nucleotides, peptides and amino acids, carbohydrates, fatty acids; genetic code, transcription, regulation and translation; exemplary biochemical pathways; catalysis; bio- and genetic engineering; genetically modified food

Lab course:

Purification of products by distillation; basic synthesis procedures: nucleophilic substitution reactions; qualitative analysis of biomolecules: nucleic acids, protein and carbohydrates; chromatographic methods; isolation of plasmid DNA and electrophoresis; basic biotechnological procedures and microbial methods: culture techniques, plant transient expression

Learning objectives

On successful completion of this module, students should

- know the relevant definitions, principles and concepts of organic, bio chemistry¹
- know the basic concepts and mechanisms of bio- and genetic engineering¹
- understand the application of bio- and genetic engineering in agriculture and the food industry²
- be able to apply theories and terminology to scientific questions^{1,2}
- be able to analyse pros and cons of the use of bio- and genetic engineering in agriculture⁴
- be able to conduct simple experiments and to document the result¹⁻³
- be able to interpret experimental results within known biochemical and molecular biology concepts^{4,5}
- know the chemical composition and main properties of lipids, protein and carbohydrates¹
- know the importance of microorganisms in biotechnology¹
- understand and apply basic biotechnological processes, with respect to the metabolism of the selected microorganism^{2,3,4,5}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab course with lab journal

Entrance requirements

Mandatory: None

Recommended: Agricultural chemistry (SA 1 4809)

Reading list

Bruice: Essential organic chemistry

Bailey and Bailey: Organic chemistry

Horton, Moran, Scrimgeour, Perry and Rawn: Principles of biochemistry

Katoch: Analytical Techniques in Biochemistry and Molecular Biology

Buchanan: Biochemistry and Molecular Biology of Plants

Benkeblia (ed.): Sustainable Agriculture and New Biotechnologies

Mascia, Scheffran and Widholm (eds.): Plant Biotechnology for Sustainable Production of Energy and Co-products

Examination in summer term 2027

graded exam: written exam, 120 minutes

certificate for lab course

Teaching materials and media

Beamer; white/black board; smart board; hand-outs; general lab equipment; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 2 4828

Agricultural Engineering II and Agrotechnology

AB 4 4828

Study Semester: 2 (full time)
4 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	50 h
Exercise	30 h	Literature review	20 h
		Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Matthias Kleinke

Lecturers

Prof. Dr. Matthias Kleinke

Teaching contents

Fundamentals of agricultural machines; properties of machinery used in the production chain, e.g., cereals, sugar beet, potato, forage harvest, irrigation technology, agro technology in plant protection; good agricultural practice; pesticides: users protection, environmental protection; stable construction and housing technology for cattle and pigs; waste management in agriculture; fundamentals of and new developments in agrotechnology (e.g. precision farming)

Learning objectives

On successful completion of this module, students should

- know the basic functioning and use of agrotechnological equipment¹
- know¹ and understand² basic concepts, apply³ and analyse⁴ exemplary case study, critically discuss necessity and limits of technology assessment⁵
- understand concepts of urban, vertical and precision farming²
- be able to apply agrotechnological solutions to agronomic problems³
- be able to analyse pros and cons of new developments in agriculture⁴
- be able to critically discuss the benefits and negative effects of agrotechnology⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursion

Entrance requirements

Mandatory:

Recommended: Agricultural Engineering I and Use of Energy in Agriculture (SA 1 4808)

Reading list

American Society of Agricultural Engineers: CIGR Handbook of Agricultural Engineering
Field and Solie: Introduction to Agricultural Engineering Technology: A Problem Solving Approach
Smit, Nasr and Ratta: Urban Agriculture – Food, Jobs and Sustainable Cities
Despommier: The Vertical Farm
Wütscher and Decker (eds.): Interdisciplinarity in Technology Assessment: Implementation and its Chances and Limits

Examination in summer term 2027

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 2 4837 Basics of Animal Anatomy, Physiology and Nutrition
 AB 4 4837

Study Semester: 2 (full time)
 2 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	20 h
Lab course/Field course	15 h	Literature review	20 h
Seminar	15 h	Preparation of assignments	20 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Coordinator

Prof. Dr. Steffi Wiedemann

Instructors

Prof. Dr. Steffi Wiedemann

Contents

Lecture and seminar:

Introduction to animal husbandry and sciences; animals in the context of sustainable agriculture; definitions in animal husbandry; basics of animal anatomy and applied physiology (integumentary and skeletal system, working of nerves and muscles, digestive system, circulatory system, respiratory system, endocrine system, sensory systems, reproductive system, lactation); basics of animal growth and development; comparative anatomy and physiology across species and within species; introduction to the composition and quality assessment of feedstuff and animal-derived products; nutrient metabolism and requirements

Lab course:

Enhancement of knowledge by demonstration of relevant organ systems, organs, milk and feed stuff, basic quality assessments of milk and feed stuff, field trip, documenting lab and field trip activities and observations, basic interpretation of lab results visually and verbally as well as in written form, responding to questions and feedback

Assignments:

Principles of topic selection, literature search and evaluation of sources, summarizing and synthesizing scientific findings, proper citation and referencing, structuring a report

Intended learning outcomes

On successful completion of this module, students should

- know the basics of animal husbandry, anatomy and physiology¹
- understand basic interactions among anatomy and physiology and animal husbandry²
- apply their knowledge in the appraisal of farm animals^{3,4}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab course; field trip

Entrance requirements

Mandatory: None

Reading list

Akers: Anatomy and physiology of domestic animals
Reece: Functional anatomy and physiology of domestic animals
Frandsen: Anatomy and Physiology of farm animals
Falls et al.: Anatomy and Physiology of Farm Animals – available as E-book

Further literature or links of interesting websites will be regularly uploaded on Moodle or presented in the lectures and seminars.

Examination in summer term 2027

graded exam: written exam, 120 minutes
certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media, online tools

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 3 4841 International Markets, Trade and Agricultural Policy
 AB 3 4041

Study Semester: 3 (full time)
 5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	40 h
Seminar	45 h	Literature review	20 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Lecture:

Introduction to agricultural policy and trade; the functioning of agricultural markets; global agricultural markets and trade; economic theory of international trade; international trade organizations; agricultural trade and development; agricultural policy as public policy; EU Common Agricultural Policy; agricultural policy in other global regions

Seminar:

For the seminars, students will complete weekly reading assignments. These reading materials consist of scientific articles and book chapters, which deepen and complement the topics covered during the lectures. Students will present their reading materials and discuss the content.

Learning objectives

On successful completion of this module, students should

- be able to demonstrate the benefits and costs that arise from international trade using economic welfare theory³
- be able to determine specialization and trade flows applying the theory of comparative advantage²
- be able to describe how agreements of the World Trade Organization govern trade relations of its member countries²
- understand the role of governments and other stakeholders in the agricultural policy arena²
- be able to apply basic concepts of political sciences to current developments in the agriculture sector³
- be able to evaluate and critically discuss agricultural and trade policies in the national and global context applying economic and political theory⁵
- comprehend and present scientific literature on module-related topics²

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture, seminar, group work, student presentation, discussions, quizzes, excursion.

Entrance requirements

Mandatory: None

Recommended: Principles of Economics (SA 1 4804)

Reading list

Peterson: A Billion Dollars a Day: The Economics and Politics of Agricultural Subsidies

Cubbage: Natural Resource Policy

B. Hill: Understanding the Common Agricultural Policy

M. Hill: The Public Policy Process

Examination in winter term 2026/27

graded exam: 1. written exam, 120 minutes (80%); 2. report and presentation (20%)

Teaching materials and media

Beamer, white board, hand-outs, online quizzes (e.g. Mentimeter and Kahoo)

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

SA 3 4845 Analysis and Interpretation of Data II

AB 3 4045

Study Semester: 3 (full time)
3 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Exercise	30 h	Literature review	10 h
		Preparation for exams	40 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Henrik Rudolf

Lecturers

Prof. Dr. Henrik Rudolf

Teaching contents

Mathematics 2: Introduction to ordinary differential equations: separable equations; Calculus: introduction to multivariate functions; Linear algebra: vector spaces and matrix operations, systems of linear equations, eigenvalue analysis;

Statistics 2: Inferential statistics; correlation, regression analysis; hypothesis testing; analysis of variance, parameter estimation

Learning objectives

On successful completion of this module, students should

- know basic mathematical concepts and procedures for multivariate problems, and their application^{1,2,3}
- understand differences in methods of analysis and display of data²
- be able to apply methods of data analysis and display to agricultural data based on $R^{3,4}$
- be able to critically assess examples of data display⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lectures; self-study; group work; exercise; feedback

Entrance requirements

Mandatory: None

Recommended:

Reading list

Milton: Head first data analysis

Ekstrom and Sorensen: Introduction to statistical data analysis for the life sciences

Soo Tang Tan: Applied mathematics for the managerial, life and social sciences

Bulmer: Principles of Statistics

Simon and Blume: Mathematics for Economists

Stewart, Redlin und Watson: Algebra and Trigonometry

Stewart: Calculus. Metric International Version

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

Study Semester: 3 (full time)
5 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach

Teaching contents

Climate change: definition of weather and climate; energy, carbon, methane and nitrogen budget of the earth; natural greenhouse gases and their control and effect on climate; present climate zones; past climates in the history of earth and suspected factors involved with natural climate change; the climate system as part of the system earth; causes (forces) for and short-term and long-term controls on climate; the effect of feedback mechanisms on climate; anthropogenic climate change from population growth coupled with agricultural and industrial expansion; climate change scenarios; outlook for the future climate and basic concepts on climate control including change of agricultural present-day to future sustainable practise; impact of climate change on agriculture; adaptation and mitigation of climate change in agriculture; tools and methods for climate impact assessment (e.g. carbon footprint, carbon offset)

Water management: fundamental knowledge about the properties of water and hydrological concepts; key technologies for water production, purification and treatment; sustainable water use and irrigation systems; integrated river management; water quality and risks; tools and methods for water use assessment (e.g. water footprint)

Learning objectives

On successful completion of this module, students should

- know the relevant factors controlling climate and the interaction and interdependence of these factors¹
- know the elements of the water cycle and water catchment management¹
- be able to outline and compute the key elements of irrigation and drainage systems^{1,3}
- know and understand natural and anthropogenic influences on our climate system²
- comprehend the concept of modelling regional climate trends for agricultural purposes²
- value water as a scarce resource and improve understanding of the importance of conserving water resources²

- be able to relate agricultural practices to climate change adaptation and mitigation^{3,4}
- master fundamental laws and equations in hydrology and their application in typical water management situations³
- be able to identify the most important procedures of water treatment and purification and appreciate their importance with regard to possible toxicological impact on human population⁴
- be able to analyse conditions of agricultural practise in the context of climate change, limited conventional energy resources and growing world population⁴
- be able to develop sensitivity and need for climate control based on past societal experiences⁵
- be able to discuss options for sustainable agriculture in a world of limited natural resources⁵
- be able to consider the social and ecological impact of professional decisions^{2,3} and thus deepen their capacity to engage in society^{2,3}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursion; feedback

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Aguado and Burt: Understanding Weather and Climate
 Ruddiman: Earth's Climate, Past and Future
 Grotzinger and Jordan: Understanding Earth
 Hornberger: Elements of Physical Hydrology
 Brutsaert: Hydrology – an Introduction
 Gray: Water Technology – an Introduction for Environmental Scientists and Engineers
 Asano: Water Reuse: Issues, Technologies and Applications
 Smith: Landscape Irrigation – Design and Management

Examination in winter term 2026/27

graded exam: assignments

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

SA 3 4848 Crop Physiology and Nutrition

AB 3 4848

Study Semester: 3 (full time)
5 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	45 h	Preparation for contact time	30 h
Lab course	30 h	Literature review	20 h
		Preparation for exams	25 h
Sum	75 h	Sum	75 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern; Prof. Dr. habil Jens Gebauer; Dr. Conor Watson; Julia Gorris

Teaching contents

Lecture:

Plant physiological responses to abiotic factors (light/radiation, temperature, water, salt); function of plant hormones; details of photosynthesis and water use in higher plants; competition and allelopathy; toxicity and plant physiological responses; functions of essential plant nutrients; uptake, transport and mobilisation of nutrients; practical nutrient management and fertilisation; methods of sustainability assessment (material flow analysis, nutrient flow analysis)

Lab course:

Plant physiological responses to abiotic factors (e.g. nutrients, salt); function of plant hormones; functions of essential plant nutrients; uptake, transport and mobilisation of nutrients; practical nutrient management and fertilisation; advanced methods of crop physiology and nutrition; applied statistics; scientific work

Learning objectives

On successful completion of this module, students should

- know the essential nutrients of plants and their basic functions¹
- know the basic plant physiological mechanisms¹
- understand effects of environmental stressors on plants²
- understand² the photosynthetic pathways and discuss³ their impact on plant water use
- be able to apply methods of crop physiology and nutrition to agricultural questions³
- be able to analyse basic connections between state of nutrition and physiological consequences⁴
- be able to analyse ecophysiological and nutritional reasons for crop rotations

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab course with lab journal; field trip

Entrance requirements

Mandatory: None

Recommended: Basics of Biology and Agroecology (SA 1 4807); Agricultural Chemistry (SA 1 4809); Soil Science (SA 1 4810); Biology and Biodiversity (SA 2 4811)

Reading list

Lambers, Stuart Chapin and Pons: Plant Ecophysiology
Larcher: Physiological Plant Ecology
Lincoln and Zeiger: Plant Physiology
Marschner: Mineral Nutrition of Higher Plants
Barker and Pilbeam: Handbook of Plant Nutrition.
Bilitewski, Härtle, Marek, Weissbach and Boeddicker: Waste Management
Fageria: The Use of Nutrients in Crop Plants

Scientific articles

Examination in winter term 2026/27

graded exam: written exam, 120 minutes
certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 3 4850 Animal Husbandry and Health

Study Semester: 3 (full time)
3 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Lab course/Field course	20 h	Literature review	20 h
Seminar	10 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Coordinator

Prof. Dr. Steffi Wiedemann

Instructors

Prof. Dr. Steffi Wiedemann; Maren Weller, M.Sc.

Contents

Lecture

Basics of animal husbandry including management, housing and nutrition of different farm animal species and systems (organic, conventional, others); introduction to animal health (individual and herd health; diagnosis, treatment, prevention of important diseases in farm animal production such as metabolic, infectious (e.g. zoonotic) or nutritional diseases); introduction to the immune system; introduction to animal hygiene; legal regulations; basics of animal breeding (quantitative genetics; pure and cross breeding; fundamentals of genomic breeding, importance of diversity, breeding strategies for sustainable agriculture)

Lab course

Practical applications to reinforce knowledge, including hands-on exercises and field excursions related to animal husbandry, health, and breeding

Seminar

Targeted exercises on animal breeding, focusing on practical applications and reinforcing theoretical knowledge

Intended learning outcomes

On successful completion of this module, students should

- know the basics of animal husbandry, health and breeding¹
- know the important livestock diseases¹
- understand the mechanisms and regulations of immune systems of different livestock species²
- understand the genetic basis of breeding programmes²
- to be able to compare animal husbandry systems with respect to influences on animal health and wellbeing^{3,4}
- know and understand major livestock diseases and are able to apply their knowledge³
- to be able to compare different breeding programmes⁴ and evaluate their success⁵

- to be able to assess animal health and disease prevention programs for a sustainable development of agriculture⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; lab course with lab journal; field trip

Entrance requirements

Mandatory: None

Recommended: Basics of Animal Anatomy, Physiology and Nutrition (SA 2 4837) or Agronomy I and Animal Husbandry (AB 1 4003)

Reading list

Gillespie: Modern Livestock and Poultry Production

Williams: The Complete Textbook of Animal Health & Welfare (available as E-book)

Field: Scientific Farm Animal Production

Damron: Introduction to Animal Science – Global, Biological, Social, and Industry Perspective,

web source: <https://wiki.groenkennisnet.nl/display/TAB/Textbook+Animal+Breding+and+Genetics>

Further literature will be either uploaded on Moodle or presented during the lectures.

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media, online tools

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

Study Semester: 3 (full time)
7 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	30 h
Exercise	30 h	Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. habil. Jens Gebauer

Lecturers

Prof. Dr. habil. Jens Gebauer

Teaching contents

History of plant pathology; losses caused by weeds, pests and plant diseases; development of pests and diseases and the effect of the environment; types of diseases incl. fungi, bacteria and viruses with examples; types of pests incl. nematodes, insects, mites, slugs/snails and wildlife with examples; problems caused by weeds and parasitic plants with examples; integrated pest management incl. physical, cultural, biotechnological and biological methods of plant protection; chemical plant protection methods and action principles; regulations and laws regarding sustainable use of pesticides; principles and concepts in plant breeding and its contribution to crop health; importance of agro-biodiversity and its conservation; plant diversity in cropping systems and its contribution to crop health

Learning objectives

On successful completion of this module, students should

- know important crop species¹
- know important weed, plant pathogen and pest species¹
- know¹ and understand² the relevant concepts of plant protection
- know¹ and understand² the relevant concepts in plant breeding
- know¹ and understand² the relevant concepts in the conservation of plant genetic resources
- understand the impact of biodiversity on ecosystem functioning²
- be able to relate their knowledge about plant protection and agrobiodiversity to its relevance in sustainable agriculture²
- be able to apply their knowledge to use pesticides in a sustainable and responsible manner³
- be able to analyse if application of pesticides is necessary⁴
- be able to critically discuss the benefits and negative effects of pesticide application⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work and presentations; field trip; exercises on species identification

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Schumann and D'Arcy: Essential Plant Pathology
Agrios: Plant Pathology
Pedigo and Rice: Entomology and Pest Management
Brown: An Introduction to Plant Breeding
Engels et al.: Managing Plant Genetic Diversity

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material, material for experiments in the greenhouse and study gardens

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 4 4824

Rural Development and Sustainable Behaviour

AB 2 4024

Study Semester: 4 (full time)
6 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	40 h
Seminar	30 h	Literature review	20 h
Exercise	15 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Lecture:

Introduction to rural development; human-ecological systems; economic development theories; measures of development; structural transformation; the role of agriculture in rural development; rural assessment approaches (Rapid and Participatory Rural Appraisal, SWOT, Interview types); strategies for rural development (e.g. cooperatives, value added, corporate responsibility, rural tourism); generation, adoption and diffusion of innovations; rural public policies.

Seminar:

For the seminars, students will complete weekly reading assignments, group tasks or online tutorials. These materials deepen and complement the topics covered during the lectures. Students will present their materials and discuss selected questions during the seminars.

Exercise:

Students will practice selected concepts during the exercise.

Learning objectives

On successful completion of this module, students should

- be able to explain rural development phenomena with the use of economic development theories²
- be able to interpret development coefficients to identify problems and formulate appropriate rural development policies³
- be able to discuss the role of agriculture and structural transformation in rural development²
- be able to apply tools commonly used in Rapid and Participatory Rural Appraisal for the assessment of development issues in rural communities³
- be able to devise a SWOT analysis and interpret the results to deduce potential development strategies⁵

- be able to critically discuss the pros and cons of alternative strategies for rural development in the context of contemporary community challenges²
- be able to analyse the adoption potential for agricultural innovations with certain characteristics by different farmer types in reference to determinants identified in the adoption literature⁴
- comprehend and present scientific literature on module-related topics²

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; exercises; discussions; self-study; group work; student presentations; research-based learning; excursions; class experiments; quizzes

Entrance requirements

Mandatory: None

Recommended: Principles of Economics (AB 1 4004)

Reading list

Singh: Rural development: principles, policies and management
 Norton, Alwang and Masters: Economics of agricultural development – World food systems and resource use
 Marsden: Agri-Food and Rural Development
 Hamdami: Rural Development – Methods and Concerns
 Yujiro Hayami and Ruttan: Agricultural Development – An International Perspective

Examination in summer term 2027

graded exam: 1. written exam, 60 minutes; 2. project paper and presentation

Teaching materials and media

Beamer; White/black board; PowerPoint presentations; scientific articles and other hand-outs; online learning platforms (e.g. Mentimeter and Kahoo); videos; podcasts.

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

SA 4 4874 Project

Study Semester:	4 (full time) 4 (part time)	Credit Points (ECTS):	5
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Workload

Contact time		Self-study	
project	40 h	Preparation for contact time	90 h
		Literature review	10 h
		Preparation for exams	10 h
Sum	40 h	Sum	110 h

Total workload: 150 h

Module coordinator

Prof. Dr. Matthias Kleinke

lecturers

Prof. Dr. Dirk Bockmühl (coordination); all lecturers of the faculty

Teaching contents

Organization of projects as part of a knowledge-based education; structuring of tasks; collection and analysis of relevant academic literature; acquisition of social competence and ability to work in a team; acquisition and deepening of subject-specific knowledge and methods; writing of academic texts; adequate presentation of results by way of posters, reports or presentation

Learning objectives

On successful completion of this module, students should

- know and apply methods of academic writing to a project relevant to the study course³
- have acquired and broadened their discipline-specific knowledge^{1,3,4}
- be able to define the relevant project phases on the basis of the project's subject and to define an appropriate project organisation¹
- be able to collect the relevant data and to discuss the information in their group²
- be able to detect multidisciplinary contexts and to apply if necessary knowledge and methods in an interdisciplinary, but always problem- and/or goal-oriented way
- be able to work independently as well as in a team and have experienced requirements and options of leadership without disciplinary authority²
- be able to analyze the scientific/academic and societal relevance of the results for the achievement of the project's goal⁴
- be able to summarize the results of the project in a written report and prepare the presentation to the study course group⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

group work; project; discussion; contact time; presentation

Entrance requirements

Mandatory: None

Recommended: basic subjects relevant for the chosen project

Reading list

Wilson: An introduction to Scientific Research

Carey: A Beginner's Guide to Scientific Method

Valiela: Doing Science: Design, Analysis, and Communication of Scientific Research

Kahn: The Student's Guide to Successful Project Teams

APittampalli: Read This before Our Next Meeting

Horine: Project Management Absolute Beginner's Guide

Portny: Project Management for Dummies

Alley: The Craft of Scientific Presentations: Critical Steps to Succeed and Critical Errors to Avoid

Hofmann: Scientific Writing and Communication: Papers, Proposals, and Presentations

Alley: The Craft of Scientific Writing

Depending on disciplinary orientation of the project the supervisor will provide relevant academic literature.

Examination in summer term 2027

certificate for project work, depends on project chosen

Teaching materials and media

Beamer; white/black board; flipchart; visualization tools (facilitator's toolcase); AV-media; demonstration material; library

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence		X	
Methodological competence	X		
Social competence	X		

last amended: May 2026

SA 4 4876 Horticulture and Agroforestry

AB 4 4876

Study Semester: 4 (full time)
6 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lectures	45 h	Preparation for contact time	25 h
Lab course/Field course	30 h	Literature review	20 h
		Preparation for exams	30 h
Sum	75 h	Sum	75 h

Total workload: 150 h

Module coordinator

Prof. Dr. habil. Jens Gebauer

Lecturers

Prof. Dr. habil. Jens Gebauer

Teaching contents

Lecture:

Nomenclature and systematics of horticultural plants; origin and domestication of horticultural plants; assessment of agro-biodiversity and its importance in sustainable production systems; diversity of important horticultural plant species (fruits, vegetables, herbs and spices, ornamentals, trees); horticultural production systems in temperate and tropical regions, their importance and aspects of their sustainability; harvest and post-harvest handling; seed production and storage of orthodox and recalcitrant seeds; sexual and vegetative propagation techniques; temperate and tropical agroforestry systems and their aspects of sustainability; tree-crop interactions; homegardens as small scale agroforestry systems; non-timber forest products including wild fruit trees

Lab course:

Training in identification of crops (hortiversity), sexual and vegetative propagation of annual and perennial crops, seeding, weeding, thinning, pruning, harvesting and post-harvest handling, farm visits

Learning objectives

On successful completion of this module, students should

- know the relevant horticultural products and their production systems¹
- know basics in propagation of horticultural crops¹
- know¹ and understand² the concepts of agro-biodiversity and centres of crop diversity
- know¹ and understand² the concepts of agroforestry production systems of different climatic zones
- be able to apply different aspects³ of sustainability in horticultural production³
- be able to evaluate the influence of environmental factors on horticultural cropping systems⁴
- be able to critically discuss the opportunities and challenges in horticulture⁵
- be able to critically discuss options of agroforestry systems⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work and presentation; demonstration materials; experiments in the greenhouse/gardens; field trip

Entrance requirements

Mandatory: None

Recommended: Crop Health and Agrobiodiversity (SA 3 4862)

Reading list

Jackson, Looney, Morley-Bunker and Thiele: Temperate and Subtropical Fruit Production
Mason: Nursery Management
Davies: Organic Vegetable Production: A Complete Guide
Dole and Wilkins: Floriculture: Principles and Species
Hartmann et al.: Plant Propagation: Principles and Practices
Kellimore: Handbook of Agroforestry
Eyzaguirre and Linares: Home Gardens and Agrobiodiversity
Akinnifesi: Indigenous Fruit Trees in the Tropics

Examination in summer term 2027

graded exam: written exam, 120 minutes
certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material, material for experiments in the greenhouse and study gardens

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

Study Semester:	4 (full time) 4 (part time)	Credit Points (ECTS):	5
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Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	30 h
Seminar	15 h	Literature review	20 h
Exercise/Excursion	15 h	Preparation for exams	40 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach

Teaching contents

Classification systems of global land use; basics, principles and concepts of cropping systems; arable farming and fodder production; introduction to grassland systems; introduction to the agronomy and biology of relevant annual and perennial crops of temperate, subtropical and tropical regions; basics of arable crop breeding; crop rotations and interactions in crops; aspects of sustainability in cropping systems; agroecological practices and scientific evidence; sustainability management, labelling and control systems in plant production ; application of methods for sustainability assessment of agronomic practices (e.g. carbon footprint); application of agronomic methods in plant production

Learning objectives

On successful completion of this module, students should

- know the relevant principles and concepts of global land use and cropping systems¹
- know how annual and perennial crops are cultivated in arable farming systems, fodder production and grassland systems¹
- be able to relate knowledge about crops and management options to its relevance in creating sustainable cropping and land-use systems²
- apply methods of sustainability evaluation³
- present and document results and findings in a scientifically appropriate format⁴
- be able to evaluate cropping sequences in agricultural systems regarding their sustainability⁵
- be able to critically discuss possibilities and shortcomings of more sustainable cropping systems in relation to the investigated sustainability parameters⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; self-study; group work; excursion; exercise; feedback; presentation

Entrance requirements

Mandatory:

Recommended: Soil Science (SA 1 4810); Biology and Biodiversity (SA 2 4811); Crop Physiology and Nutrition (SA 3 4848)

Reading list

Rehm and Espig: The Cultivated Plants of the Tropics and Subtropics

Gliessman: Agroecology

Odum: Fundamentals of Ecology

McMahon, Kofranek and Rubatzky: Plant Science

Martin, Waldren and Stamp: Principles of Field Crop Production

Livingston: Field Crop Production

Sheaffer and Moncada: Introduction to Agronomy

Various scientific articles

Examination in summer term 2027

graded exam: 1. written exam, 90 minutes (70%); 2. assignment (30%)

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 4 4911 Organic Farming (elective module)

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	35 h
Seminar	30 h	Literature review	35 h
Exercise	15 h	Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern

Teaching contents

History, principles and concepts of organic farming in various countries; statistics and development of organic farming; sustainability of organic farming systems

Learning objectives

On successful completion of this module, students should

- know the principles of organic farming in Europe, the United States and other relevant countries¹
- understand the conceptual and practical differences between conventional and organic farming²
- be able to critically discuss publications comparing conventional and organic farming⁴
- be able to evaluate the sustainability of organic farming systems⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursion; case studies; lab course; field trip

Entrance requirements

Mandatory: None

Recommended: Basics of Biology and Agroecology (SA 1 4807); Soil Science (SA 1 4810); Crop Physiology and Nutrition (SA 3 4848); Horticulture and Agroforestry (SA 4 4876)

Reading list

Schmidt and Kloeble: Reference figures for organic farming inspections
Lampkin: Organic farming
Lampkin, Measur and Padel: Organic farm management handbook
Scientific articles

Examination in summer term 2027

graded exam: 1. written exam, 120 minutes (70%); 2. assignments (30%)

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 4 4912 Phytomedicine (elective module)

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lab course	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. habil. Jens Gebauer

Lecturers

Prof. Dr. habil. Jens Gebauer; Dipl.-Ing. agr. Julia Gorris

Teaching contents

Concepts of pests and diseases in plants; types of plant pests and diseases; losses caused by pests and plant diseases; development of pests and diseases and the effect of the environment; abiotic factors; weeds; fungi; bacteria; nematodes; viruses; slugs and snails; insects; wildlife

Students will elaborate on their practical, methodical and analytical skills in field trips/excursions, exercises and lab courses.

Learning objectives

On successful completion of this module, students should

- have broadened their knowledge base on plant species in particular crops and soils and their management^{1,2}
- be able to apply the knowledge gained on plants and soils to other cropping systems and soils³
- be able to analyse crop production systems and soils as basis for sustainable agriculture⁴
- be able to disseminate their knowledge to both scientific and non-scientific audience⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lectures; seminar; self-study; literature review; group work and presentation; field trip/excursion; exercise; lab course

Entrance requirements

Mandatory: None

Recommended: Basics of Biology and Agroecology (SA 1 4807); Soil Science (SA 1 4810); Biology and Biodiversity (SA 2 4811); Crop Physiology and Nutrition (SA 3 4848); Crop Health and Agrobiodiversity (SA 3 4862)

Reading list

Schumann and D'Arcy: Essential Plant Pathology
Agrios: Plant Pathology
Pedigo and Rice: Entomology and Pest Management

Examination in summer term 2027

graded exam: 1. written exam, 60 minutes; 2. paper certificate for lab course

Teaching materials and media

Beamer; white/black board; hand-outs; greenhouse/garden equipment; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence		X	

last amended: May 2026

SA 4 4913 Applied Animal Husbandry and Feeding Systems (elective module)

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	30 h
Exercise/Field course	15 h	Literature review	30 h
Seminar	30 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Coordinator

Prof. Dr. Steffi Wiedemann

Instructors

Prof. Dr. Steffi Wiedemann and other lecturers

Contents

Lectures and seminars:

Animal husbandry systems (focusing on species-specific needs, contextual variations by country); Advanced animal nutrition (species-appropriate feeding systems, nutritional requirements); Animal housing (design, ventilation, lighting, space management); Climate effects (adaptive strategies in housing and nutrition for different climates); Group discussions

Exercise/Field course

Practical application of animal husbandry techniques; Field visits focused on husbandry systems and feeding practices

Intended learning outcomes

On successful completion of this module, students should

- be able to describe different husbandry systems for the most relevant farm animal species¹
- understand interactions between livestock farming systems and the environment ²
- be able to apply standard procedures to manage nutrition in farm animals³
- be able to critically discuss advantages and disadvantages of different livestock husbandry systems⁴
- be able to develop management recommendations for livestock farms to improve their sustainability⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; exercise; self-study; e-learning units; literature review; group work and presentation; field course

Entrance requirements

Mandatory: None

Recommended: Basics of Animal Anatomy, Physiology and Nutrition (SA 2 4837) or Agronomy I and Animal Husbandry (AB 1 4003); Animal Husbandry and health (SA 3 4850)

Reading list

Williams: The Complete Textbook of Animal Health & Welfare

Hafez and Hafez: Reproduction in Farm Animals

Bearden, Fuquay and Willard: Applied Animal Reproduction

Current journal articles provided in the course

Examination in summer term 2027

graded exam: 1. written exam, 90 minutes (60%); 2. presentation (25%); 3. written assignments (15%)

Teaching materials and media

Beamer; white/black board; e-learning platform; flipchart; visualisation aids for presentation; demonstration material; online tools

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 4 4914 Innovative Solutions for Sustainable Land Use (elective module)

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Seminar	30 h	Preparation for contact time	35 h
Project	30 h	Literature review	35 h
		Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach

Teaching contents

Seminar: sustainability-oriented innovation and entrepreneurship; sustainable land-use; idea generation and design thinking; sustainable business models; excursion to innovative firms and incubators

Project: developing a project on innovative solutions for sustainable land use, researching the relevant background, materials needed, stakeholders involved; pitching a start-up idea based on this project

Learning objectives

On successful completion of this module, students should

- know relevant concepts to develop ideas to improve sustainable solutions for land use¹
- be able to use and apply tools to develop ideas²
- be able to conduct a pitch on an innovative project contributing to sustainable land use³
- be able to assess a project idea with sustainability tools^{3,4}
- be able to create a sustainable business model based on an idea³
- be able to manage a project and gather relevant information for its success³

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

self-study; group work; excursion

Entrance requirements

Mandatory: None

Recommended: Sustainable Learning – Learning Sustainability (SA 1 4802); Sustainable Land Use Systems (SA 4 4883)

Reading list

Pietsch: Bioeconomy for Beginners

Bessant, Kokshagina, Papageorgiou: The Future of Learning Playbook

Various papers and project-relevant literature

Examination in summer term 2027

graded exam: 1. project report (30%); 2. presentation (20%); 3. written exam (60 minutes) (50%)

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 4 4915 Education for Sustainable Development (elective module)

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	35 h
Seminar	30 h	Literature review	35 h
Exercise	15 h	Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern; Prof. Dr.-habil. Jens Gebauer; NN

Teaching contents

Concepts of education for sustainable development; principles of knowledge transfer and communication; acquisition of social competence and ability to work in a team; acquisition and deepening of subject-specific knowledge and methods; writing of texts and adequate presentation of results for variable audiences by way of posters, reports or presentations

Learning objectives

On successful completion of this module, students should

- know and apply methods of education for sustainable development in a project relevant to the study course³
- have acquired and broadened their discipline-specific knowledge^{1,3,4}
- be able to detect multidisciplinary contexts and to apply knowledge and methods in an interdisciplinary, but always problem- and/or goal-oriented way^{2,3,4,5}
- be able to work independently as well as in a team and have options of leadership²
- be able to analyze the scientific/academic and societal relevance of the results for the achievement of a project's goals⁴
- be able to summarize the results of the project in a written report and prepare the presentation to a variable audience⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursions; case studies; lab course; field trips

Entrance requirements

Mandatory: None

Recommended:

Reading list

Various case studies and scientific publications; soil classification manuals; agroecology manuals; manuals for vegetation appraisal

Examination in summer term 2027

graded exam: 1. practical and written assignments (70%); 2. oral presentation (30%)

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence	X		

last amended: May 2026

AB 2 4021 Strategy and Management

SA 4 4021 (elective module)

Study Semester: 4 (full time)
6 or 10 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	40 h
Seminar	30 h	Literature review	20 h
Exercise	15 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Dalhaus

Lecturers

Prof. Dr. Tobias Dalhaus

Teaching contents

Lecture:

Introduction to agribusiness; industry evolution and industry life cycle; introduction to strategy; sources of competitive advantage; impact of the external environment; Porter's Five-Forces analysis; Porter's generic strategies; resources, capabilities and competencies; competitive rivalry and cooperation; decision-making under uncertainty; vertical integration; diversification strategy; internationalization strategy; Corporate Social Responsibility

Seminar:

During the seminars, business case studies will be discussed in which students are confronted with a real-life business problem and are supposed to take the role of an entrepreneur and/or decision-maker aiming to solve the problem at hand applying the concepts covered during the previous lectures.

Exercise:

During spreadsheet modelling exercises students learn to apply various analytical tools/ methods for decision-making under uncertainty.

Learning objectives

On successful completion of this module, students should

- be able to explain the strategic role of managers in the development and long-term success of agribusiness enterprises¹
- be able to describe and compare key strategic concepts including industry life cycles, sources of competitive advantage, and Porter's frameworks²
- be able to apply strategic management tools (e.g., Porter's Five Forces, SWOT, spreadsheet modelling) to analyse typical challenges faced by agribusiness firms⁴
- be able to evaluate strategic options such as vertical integration, diversification, and internationalization in the context of real-world case studies⁵

- be able to develop and justify strategic recommendations for agribusiness firms by integrating insights from case studies, external environment analysis, and internal capabilities³
- be able to critically reflect on the ethical and social dimensions of strategic decision-making, including the role of Corporate Social Responsibility (CSR)⁵
- be able to communicate strategic analyses and decisions clearly and persuasively, both in written and oral form, from the perspective of business leaders and entrepreneurs⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; case study discussions (Harvard Case Study Method); spreadsheet exercises; self-study; group work and presentations; excursion

Entrance requirements

Mandatory: Pass of the Excel test administered at the beginning of the semester

Recommended: None

Reading list

Grant: Contemporary strategy analysis
 Beierlein, Schneeberger and Osburn: Principles of Agribusiness Management
 Hoskisson, Hitt and Ireland: Competing for advantage
 Campbell, Edgar and Stonehouse: Business Strategy – an Introduction

Examination in summer term 2027

graded exam written exam, 120 minutes
 certificate for seminar and exercise

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart/ pin-board; visualisation aids for presentation; demonstration materials

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

AB 2 4023 Financial Accounting

SA 4 4023 (elective module)

Study Semester: 4 (full time)
6 or 10 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	40 h
Seminar	15 h	Literature review	30 h
Exercise	30 h	Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Dalhaus

Lecturers

Prof. Dr. Tobias Dalhaus

Teaching contents

Fundamentals of financial accounting; balancing and balance sheet preparation (Fundamental Accounting Equation); difference between Accrual Basis Accounting and Cash Basis Accounting; accounting policy and management tools; financial statement analysis ; accounting on farms and in agribusiness; regulations and legal framework of accounting in agriculture (IAS41); double-entry bookkeeping (journal entries, T-accounts); inventory valuation (FIFO, LIFO, weighted average); depreciation methods (straight-line, declining balance).

Learning objectives

On successful completion of this module, students should

- be able to describe the legal and regulatory framework of accounting in agriculture in the context of IAS 41 requirements for agricultural enterprises¹
- be able to explain fundamental accounting principles (e.g. the Fundamental Accounting Equation, and accrual vs. cash basis accounting), and the role of accounting policies and management tools in agribusiness²
- be able to apply accounting methods and bookkeeping techniques preparing journal entries, T-accounts, and financial statements (balance sheet, income statement) for farms and agribusinesses³
- be able to perform inventory and asset valuation by calculating inventory values using FIFO, LIFO, and weighted average methods, and apply depreciation methods such as straight-line and declining balance³
- be able to analyse financial statements and data using appropriate tools and ratios to assess performance and financial health of agribusinesses⁴
- be able to evaluate accounting methods with their strengths and weaknesses, considering the implications of different accounting approaches and policies in agricultural contexts⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; case studies; lab course

Entrance requirements

Mandatory: None

Recommended: Principles of Economics (AB 1 4004)

Reading list

Weygandt et al.: Accounting Principles

Horngrén, Harrison and Oliver: Financial and managerial accounting

Needles, Powers and Crosson: Financial and managerial accounting

Examination in summer term 2027

graded exam written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

Reading list

Chopra and Meindl: Supply Chain Management: Strategy, Planning and Operation
Harrison and van Hoek: Logistics Management and Strategy: Competing through the Supply Chain
Bourlakis and Weightman: Food Supply Chain Management
Goodman, Holloway, Kneafsey and Maye: Geographies of Food
Manning: Developing Smart Agri-Food Supply Chains
Bourlakis, Vlachos, Zeimpekis: Intelligent Agrifood Chains and Networks

Examination in summer term 2027

graded exam written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; case studies, A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

AB 4 4072 Entrepreneurship and Innovation Management
SA 4 4072 (elective module)

Study Semester: 4 (full time)
 6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	30 h
Seminar	15 h	Literature review	30 h
Exercise	15 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Marcel Friedrich

Lecturers

Prof. Dr. Marcel Friedrich

Teaching contents

Entrepreneurship: concepts of entrepreneurship; business plans and business planning; marketing research and marketing plans; operational plans; application of relevant concepts in developing a business plan

Innovation Management: introduction to innovation and innovation management; psychology and prerequisites of innovation; methods of innovation system analysis and management; creativity techniques; technology management

Learning objectives

On successful completion of this module, students should

- know the components of business plans¹
- know basic metrics to assess operational and financial business performance¹
- know the relevant concepts and tools of entrepreneurship¹
- be familiar with issues related to the establishment of an agribusiness enterprise²
- be able to analyse the potential market and competitiveness of a proposed business³
- be able to conduct financial analyses⁴
- be able to develop a business plan⁵
- know the relevant concepts innovation and technology management¹
- know the relevant creativity techniques¹
- be able to relate their knowledge about innovation and modern marketing to the agribusiness context²
- be able to apply innovation strategies to products and services in agribusiness³
- be able to analyse⁴ and critically discuss⁵ the advantages and disadvantages of innovation management for agribusiness enterprises
- be able to consider the social impact of professional decisions^{2,3} and thus deepen their capacity to engage in society^{2,3}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

lecture; self-study; group work

lecture; group work and presentation; self-study; excursion

Entrance requirements

Mandatory: None

Recommended: Marketing (AB 1 4001); Financial Accounting (AB 2 4023)

Reading list

Trott: Innovation management and new product development

Maital and Seshadri: Innovation management: Strategies, concepts, and tools for growth and profit

Bygrave and Zacharakis: Entrepreneurship

Burke: Fundamentals of Project Management: Tools and Techniques

Wickham: Strategic Entrepreneurship

Marotti: Entrepreneurship and Small Business Management

Maye, Holloway and Kneafsey: Alternative Food Geographies: Representation and Practice

Examination in summer term 2027

graded exam 1. paper (50%); 2. presentation/oral exam (50%)

Teaching materials and media

Beamer; white/black board; pc pool; flipchart; visualisation aids for presentation

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

AB 4 4073 Market Research

SA 4 4073 (elective module)

Study Semester: 4 (full time)
6 or 10 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	40 h
Seminar	15 h	Literature review	30 h
Exercise	30 h	Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Consumer studies; research process; research design; primary research; secondary research; quantitative research; qualitative Research; questionnaire design; market experiments; measurement; sampling; data analysis; reporting

Learning objectives

On successful completion of this module, students should

- be able to formulate market research questions based on areas of marketing strategy²
- know the conditions and constraints of various research tools and determine the appropriate research methodology (quantitative vs. qualitative, type of survey, experiment, etc.) based on the research question and objectives²
- be able to evaluate a market research experiment applying standard recommendations for the implementation of experiments⁵
- be able to design a questionnaire for the application in market research, correctly formulating questionnaire items following the teaching material provided in class³
- be able to analyse data using basic statistical methodology in Excel or similar tools⁴
- be able to document and present results and findings in a scientifically appropriate form⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; exercises; self-study; group work; student presentations; discussions; quizzes; class experiments; research-based learning

Entrance requirements

Mandatory: none

Recommended: Analysis and Interpretation of Data I (AB 1 4005); Analysis and Interpretation of Data II (AB 3 4045)

Reading list

Brace: Questionnaire Design

Birn: The International Handbook of Market Research Techniques

Chapman and McDonnell Feit: R for Marketing Research and Analytics

McGivern: The Practice of Market Research

Norwood and Lusk: Agricultural Marketing and Price Analysis

Schnettler and Wendt: Marketing und Marktforschung

Zikmund and Babin: Essentials of Marketing Research

Examination in summer term 2027

graded exam: 1. written exam, 90 minutes; 2. report / presentation

Teaching materials and media

Beamer; White/black board; Hand-outs; Online learning platforms (e.g. Mentimeter, and Kahoot); Videos; Data sets; Podcasts.

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 4 WPF_1 Module from any Bachelor Study Course at the Faculty of Life Sciences at Rhine-Waal University of Applied Sciences

Study Semester: 4 (full time)
6 or 10 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Peter F. W. Simon

Lecturers

All lecturers of the faculty

Teaching contents

Depending on the chosen module to be elected from any bachelor study course of the faculty of Life Sciences

Learning objectives

On successful completion of this module, students should

- Have acquire knowledge from other areas of the faculty and deepened or enlarged their horizon¹
- understand the importance of getting information beyond their specialisation²
- be able to implement alternative ways and approaches to problem solving³
- be able to compare contents and learning outcomes of other study courses with their own achievements⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Depending on chosen module

Entrance requirements

Depending on chosen module

Reading list

Depending on chosen module

Examination

graded exam: depends on chosen module

Teaching materials and media

Depending on chosen module

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

SA 5 4844

Natural Resource and Environmental Economics

AB 3 4044

Study Semester: 5 (full time)
7 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	45 h
Seminar	15 h	Literature review	20 h
Exercise	30 h	Preparation for exams	25 h
Sum	60 h	Sum	90 h

Total workload: 150

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Environment and economics; markets and welfare; market failure; types of goods; property rights; externalities; Coase Theorem; instruments for pollution control including taxes and tradable permits; management of common property resources; prisoner's dilemma; efficient use of renewable and non-renewable natural resources; environmental valuation; cost-benefit analysis; payments for ecosystem services

Learning objectives

On successful completion of this module, students should

- be able to explain the relevant concepts and principles of natural resource and environmental economics²
- be able to determine optimal levels of pollution following the equi-marginal principle³
- be able to evaluate the potential of the Coase Theorem to be applied to a given environmental problem and suggest measures to meet the necessary conditions⁵
- be able to mathematically resolve environmental pollution problems and problems associated with instruments for pollution control³
- be able to calculate the optimal extraction levels and rotation periods of renewable and non-renewable natural resources³
- be able to apply monetary valuation techniques for non-traded environmental goods and services³
- be able to apply cost benefit analysis to projects in the agribusiness and environmental sector³

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; group discussions; student presentation; exercises; case studies; quizzes

Entrance requirements

Mandatory:

Recommended: Principles of Economics (AB 1 4004)

Reading list

Tietenberg and Lewis: Environmental & Natural Resources Economics
Perman, Ma, Common, Maddison and McGilvray: Natural Resource and Environmental Economics
Pearce, Atkinson and Mourato: Cost Benefit Analysis and the Environment: Recent Developments

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; demonstration material; videos; interactive software

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

SA 5 4921 Ethics in Life Sciences

AB 5 4121

Study Semester: 5 (full time)
11 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	30 h
Seminar	30 h	Literature review	30 h
		Preparation for exams	45 h
Sum	45 h	Sum	105 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach

Teaching contents

Logic, argumentation and science; the nature of reality; knowledge and truth; theories of ethics and morality; ethical and moral reasoning; tools to approach an applied ethics assessment in life sciences; ethics in food security, food safety and biomass production; ethics in life sciences

Learning objectives

On successful completion of this module, students should

- know and be able to identify the basic concepts and theories of philosophy and ethics^{1,2}
- know how to plan and conduct a seminar on a relevant topic of life sciences ethics¹
- comprehend the necessity of systematic and fact-based approaches to assess technologies from an ethical perspective²
- be able to identify and distinguish moral reasoning²
- be able to apply ethical concepts as an instrument for moral reasoning³
- be able to analyse texts and presentations for moral reasoning of topics relevant in life sciences⁴
- be able to critically discuss relevant topics of life sciences ethics in the context of a sustainable development of agriculture⁵
- be able to consider the social, ecological and ethical impact of occupational decisions^{2,3} and thus deepen their ability to engage in society^{2,3}
- be able to consider the social an ethical impact of professional decisions^{2,3} and thus deepen their capacity to engage in society^{2,3}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Seminar; self-study; group work; feedback; presentation

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Comstock: Life Science Ethics

Solomon: The Big Questions: A Short Introduction to Philosophy

Rachels: The Elements of Moral Philosophy

Examination in winter term 2026/27

graded exam: assignments

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence		X	
Methodological competence	X		
Social competence	X		

last amended: May 2026

Study Semester: 5 (full time)
7 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	45 h
Exercise	15 h	Literature review	20 h
Project	30 h	Preparation for exams	25 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Prof. Dr. Tobias Wünscher

Teaching contents

Agricultural supply and food value chains; economic, environmental and social sustainability of supply chains; sustainable business relationships in the food value chain; instruments of sustainability assessment in the agrifood sector; certification and traceability; lifecycle assessment; environmental accounting; green markets; current issues in international agrifood chains

Learning objectives

On successful completion of this module, students should

- know the relevant dimensions of sustainability in the agrifood chain¹
- be able to apply a method of sustainability assessment to the agricultural sector and interpret the results³
- be able to conduct a lifecycle assessment with provided case study data³
- be able to implement the steps required for the certification of a supply chain³
- be able to write a scientific report on a related topic and present it in a conference-like setting⁴
- be able to critically discuss the findings of the report⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; research-based learning; exercises; excursion; case studies; student presentations

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Various case studies and scientific publications will be provided by the lecturer

Examination in winter term 2026/27

graded exam: 1. written exam, 60 minutes; 2. report/presentation

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; demonstration material; quizzes

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence	X		

last amended: May 2026

SA 5 4925 Animal Welfare

AB 5 4925

Study Semester: 5 (full time)
7 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	15 h
Exercises/Field trip(s)	30 h	Literature review	20 h
		Preparation of written assignment	15 h
		Preparation of scientific presentation	10 h
		Preparation for exam	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Coordinator

Prof. Dr. Steffi Wiedemann

Instructors

Prof. Dr. Steffi Wiedemann

Contents

Lecture: Comparative analysis of international standards of animal welfare in livestock farming and aquaculture; current debates and ethical issues in animal welfare; basics and methods of animal ethology, including observation and evaluation of animal behaviour; criteria and methods for welfare assessment; animal welfare considerations in housing, transport, and slaughtering of livestock and fish; principles of safe and low-stress handling practices; the impact of welfare practices on productivity, livestock health, and sustainability; emerging welfare challenges in modern farming and aquaculture settings.

Lab Course/Field Course: Enhancement of knowledge through the application of methods to assess animal welfare in real and simulated farm settings; design and implementation of simple ethological experiments to observe and analyze animal behaviour; opportunities to work hands-on with welfare assessment protocols and conduct field observations.

Group Work and Discussion: Case study analysis and problem-solving exercises focused on practical challenges in animal welfare; collaborative group discussions to develop and critique welfare solutions

Scientific Methods: Advanced scientific communication skills (building on prior knowledge) including structuring and delivering a scientific presentation and writing an assignment in preparation of the thesis; research and information-gathering strategies; techniques for clear and effective data presentation and interpretation; fostering critical thinking and building arguments based on evidence; utilizing peer review and feedback for improvement; and practicing self-reflection for continuous improvement

Intended learning outcomes

On successful completion of this module, students should

- be able to analyse and compare international animal welfare standards, understanding key ethical debates^{1,4}
- be able to apply observational methods and welfare assessment criteria in various livestock and aquaculture contexts^{1,3}

- understand low-stress handling techniques and assess the impact of welfare practices on productivity and health^{1,2,4}
- be able to identify and evaluate emerging welfare challenges in modern farming and aquaculture^{1,4,5}
- be able to conduct welfare assessments in field and seminar settings, including designing basic ethological experiments^{2,3,4,5}
- be able to analyse case studies and collaboratively develop welfare solutions in group settings^{1,2,4,5}
- be able to exhibit advanced scientific communication skills in presentations and writing, interpret data effectively, conduct research, and build evidence-based arguments^{2,5}
- be able to utilize peer review and feedback for improvement, engaging in self-reflection to continuously enhance communication skills^{2,5}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; self-study; group work; student-led presentation; field trip; peer review, case study, portfolio development, additional online learning modules

Entrance requirements

Mandatory: None

Recommended: Basics of Animal Anatomy, Physiology and Nutrition (SA 2 4837); Animal Husbandry and health (SA 3 4850)

Reading list

Welfare Quality Assessment Protocol® and other welfare evaluation guidelines
Livestock Handling and Transport, Temple Grandin

Recent journal articles, publications, further literature or links of interesting websites will be regularly uploaded on Moodle or presented in the lectures.

Examination in winter term 2026/27

graded exam: 1. written exam, 90 minutes (60%); 2. semester projects (40%)

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; A/V media, online tools

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 5 4963 Soil Ecology (elective module)

Study Semester:	5 (full time) 5 (part time)	Credit Points (ECTS):	5
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Workload

Contact time		Self-study	
Lab course	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

Prof. Dr. Florian Wichern; Dr. Conor Watson, NN

Teaching contents

The elective module deals with the influence of environmental and human factors on soil biology and associated matter fluxes. In the lab course, students determine basic physical and chemical soil characteristics, estimate soil fauna and/or microbial biomass and soil microbial activity. They determine carbon and nutrient fluxes, microbial resource use efficiency and the potential nutrient release. Further, students will learn about means of soil protection. Along with lab procedures and analytical methods, students will learn to design and statistically evaluate experiments. Finally, scientific writing will be practiced by delivering a scientific report based on own investigations.

Learning objectives

On successful completion of this module, students should

- know microbial indicators of soil ecology¹
- know how soil biology is influenced by abiotic and biotic factors¹
- be able to relate their knowledge about soil ecology to its relevance in sustainable agriculture²
- apply special analytical lab procedures of soil ecology in lab experiments³
- analyse and document results and findings in a scientifically appropriate form⁴
- analyse how their data fit to the data of others⁴
- be able to evaluate the influence of different soil treatments on soil biological properties and determine their contribution to sustainable soil use⁵
- be able to critically discuss options of sustainable soil use and soil health in an agricultural context⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lectures; seminar; self-study; literature review; group work and presentation; field trip/excursion; exercise; lab course

Entrance requirements

Mandatory: None

Recommended: Basics of Biology and Agroecology (SA 1 4807); Soil Science (SA 1 4810); Biology and Biodiversity (SA 2 4811); Crop Physiology and Nutrition (SA 3 4848); Crop Health and Agrobiodiversity (SA 3 4862)

Reading list

Killham: Soil Ecology

Various scientific publications for methods and comparison of results

Examination in winter term 2026/27

graded exam: paper, as pdf via email

Teaching materials and media

Beamer; white/black board; hand-outs; greenhouse/garden equipment; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence		X	

last amended: May 2026

SA 5 4964 Sustainability and Herd Health in Livestock Farming (elective module)

Study Semester: 5 (full time)
5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	15 h	Preparation for contact time	30 h
Exercise/Field course	15 h	Literature review	30 h
Seminar	30 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Coordinator

Prof. Dr. Steffi Wiedemann

Instructors

Prof. Dr. Steffi Wiedemann and other lecturers

Contents

Lectures

Principles of sustainability in livestock systems; Resource efficiency and sustainable feeding; Herd health and preventive disease management; Biosecurity and risk management; Climate resilience strategies and cost-benefits of preventive health; Environmental sustainability and animal welfare

Exercises/Field course

Field visit to a farm to observe sustainable practices and biosecurity in action; Exercises in developing health and sustainability plans as well as in developing biosecurity practices

Seminar

Group research on sustainability challenges in herd health; Presentations on case studies in environmental impact, Discussions on health management economics, welfare and ethical considerations

Intended learning outcomes

Sustainable Animal Husbandry

On successful completion of this module, students should

- describe different husbandry systems for the most relevant farm animal species¹
- understand interactions between livestock farming systems and the environment ²
- apply standard procedures to manage nutrition in farm animals³
- critically discuss advantages and disadvantages of different livestock husbandry systems⁴
- develop management recommendations for livestock farms to improve their sustainability⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; exercise; self-study; e-learning units; literature review; group work and presentation; field course

Entrance requirements

Mandatory: None

Recommended: Basics of Animal Anatomy, Physiology and Nutrition (SA 2 4837) or Agronomy I and Animal Husbandry (AB 1 4003); Animal Husbandry and health (SA 3 4850)

Reading list

Williams: The Complete Textbook of Animal Health & Welfare

Hafez and Hafez: Reproduction in Farm Animals

Bearden, Fuquay and Willard: Applied Animal Reproduction

Current journal articles provided in the course

Examination in winter term 2026/27

graded exam: 1. written exam, 90 minutes (60%); 2. presentation (25%); 3. written assignments (15%)

Teaching materials and media

Beamer; white/black board; e-learning platform; flipchart; visualisation aids for presentation; demonstration material; online tools

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 5 4965 Ecological and Bioeconomic Modelling (elective module)

Study Semester: 5 (full time)
5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Seminar	30 h	Preparation for contact time	35 h
Exercise	30 h	Literature review	35 h
		Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr.-Ing. Sylvia Moenickes

Lecturers

Prof. Dr.-Ing. Sylvia Moenickes

Teaching contents

Models for growth, harvesting, population interaction, environmental effects; agro-ecological models for decision support like fertilization strategies; bioeconomic models, revenues, maximization, tragedy of the commons, sustainability as steadiness and stability of critical points (attractor, repeller)

Computer based modelling with Matlab/R; Methods for coding in a team

Learning objectives

On successful completion of this module, students should

- know relevant properties of ecological systems defining their long-term behaviour¹
- understand balance equations describing ecological systems^{1,2,3}
- be able to set up balance equations for ecological processes³
- be able to solve these equations with the help of computer algebra systems³
- be able to support decisions in ecological management^{4,5}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursion; case studies; lab course; field trip

Entrance requirements

Mandatory: None

Recommended: Analysis and Interpretation of Data I (SA 1 4805) and II (SA 3 4845)

Reading list

Literature will be given during the lecture.

Examination in winter term 2026/27

Graded exam: 1. written exam, 60 minutes; 2. assignment in coding

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 5 4966 Environmental Protection and Renewable Energy (elective module)

Study Semester: 5 (full time)
5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	35 h
Seminar	15 h	Literature review	35 h
Exercise	15 h	Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Matthias Kleinke

Lecturers

Prof. Dr. Matthias Kleinke

Teaching contents

Introduction to environmental protection in agriculture; basics of environmental law; environmental pollutants; emission protection for air, water, soil; handling waste and waste water; renewable energy sources: wind and solar power, properties and utilisation; production processes of biofuels: conventional and lignocellulosic ethanol and methanol production; hydrogen from biomass; biodiesel production; solid biomass; combustion, carbonisation and gasification of biomass; anaerobic fermentation; production costs of biofuels; GHG emissions; sustainability of energy production and utilisation in agriculture

Learning objectives

On successful completion of this module, students should

- know the fundamentals environmental protection in agriculture¹
- understand basic functioning and use of technology in environmental technologies²
- understand the technology for energy production in agriculture²
- be able to apply technological solutions to agricultural problems³
- be able to analyse pros and cons of different technology approaches⁴
- be able to critically discuss the benefits and negative effects of different technologies⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; group work; excursion; case studies; lab course; field trip

Entrance requirements

Mandatory: None

Recommended: Agricultural Engineering I and Use of Energy in Agriculture (SA 1 4808); Agricultural Engineering II and Use of Energy in Agriculture (SA 2 4828)

Reading list

Miller, Spoolman and Andrews-Brown: Environmental Science

Spooner: Environmental Science for Dummies

Twidell: Renewable Energy Resources

Lee and Sunggyu: Biofuels and Bioenergy

Luque: Handbook of Biofuels Production

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

Study Semester: 5 (full time)
5 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lab Course	60 h	Preparation for contact time	35 h
		Literature review	35 h
		Preparation for exams	20 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Natalie Laibach

Lecturers

Prof. Dr. Natalie Laibach

Teaching contents

Conducting experiments in the laboratory with state-of-the art questions on crop plant responses to environmental stimuli; analysis of physiological, biochemical and molecular biology parameters of crop plants; statistical analysis and interpretation of results from laboratory and greenhouse experiments

Learning objectives

On successful completion of this module, students should

- know relevant plant metabolic pathways and basics of plant molecular biology in response to environmental stimuli¹
- be able to carry out experiments to assess plant biochemical and molecular biology responses to abiotic stimuli
- apply knowledge about plant ecology and biochemistry to laboratory experiments²
- be able to plan, conduct, interpret experiments and their results³
- be able to analyse outcomes of plant physiological and molecular biology experiments with appropriate statistical methods⁴
- be able to assess the relevance of research in plant physiology and molecular biology to agriculture⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

self-study; group work; lab course

Entrance requirements

Mandatory: None

Recommended: Organic and Biochemistry, Biotechnology (SA 2 4827), Basics of Biology and Agroecology (SA 1 4807), Crop Physiology and Nutrition (SA 3 4848)

Reading list

Katoch: Analytical Techniques in Biochemistry and Molecular Biology

Buchanan: Biochemistry and Molecular Biology of Plants

Various case studies and scientific publications

Examination in winter term 2026/27

graded exam: 1. project report (30%); 2. presentation (20%); 3. written exam (60 minutes) (50%)

Teaching materials and media

Beamer; white/black board; lab equipment; flipchart; visualisation aids for presentation

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

Entrance requirements

Mandatory: None

Recommended: Principles of Economics (AB 1 4004)

Reading list

Norwood, Lusk, Peel and Riley: Agricultural marketing and price analysis

Kotler, Armstrong and Balasubramanian: Principles of Marketing

Examination in winter term 2026/27

graded exam: 1. written exam, 120 minutes; 2. seminar paper

Teaching materials and media

Beamer; white/black board; hand-outs; lab equipment; flipchart; visualisation aids for presentation; demonstration material

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

AB 1 4018 Extension and Communication

SA 5 4018 (elective module)

study semester: 5 (full time)
5 (part time)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Seminar	15 h	Literature review	20 h
Exercise	15 h	Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Dahlhaus

Lecturers

Prof. Dr. Tobias Dahlhaus, Douglas Beard

Teaching contents

Lecture: Role and scope of agricultural extension; principles of human behaviour and behavioural change; agricultural extension paradigms; selected extension approaches and models; basic skills of extension agents; interpersonal communication; intercultural communication competence; culture and perception of self and others; emotion and conflict; listening; verbal messages; non-verbal messages; visualizing of complex data; diffusion of innovations theory; agriculture innovation systems and stakeholders in agriculture extension; innovations and innovation networks in agriculture; agricultural extension as public vs. private good; principles of project management

Communication Seminar: Students will present and discuss topics covered during the entire module.

Exercise: Students apply and practice theoretical communicative concepts in simulations, partner exercises and video-taped role plays. Students will receive peer and instructor feedback. Further, in groups of 4-6 students, students are confronted with a close-to-real decision problem of a typical farm (e.g., machinery investment, farm expansion, business diversification). During the course of the semester, students will complete the problem-solving cycle in a step-by-step manner identifying, analysing and evaluating potential solutions and presenting their final recommendations to a fictional client during a role play situation.

Learning objectives

On successful completion of this module, students should

- be able to identify key concepts and principles of interpersonal and intercultural communication¹
- be able to apply effective verbal, non-verbal, and intercultural communication techniques in advisory contexts³
- be able to demonstrate the ability to initiate, sustain, and conclude professional conversations, including managing emotionally charged interactions³
- be able to explain advantages and disadvantages of major models of agricultural extension²

- be able to explain how agricultural innovations emerge and spread in the context of innovation systems²
- be able to apply the concepts and frameworks of advisory communication and project management to a hypothetical client situation in the context of agribusiness³
- be able to analyse advisory situations and current developments in agricultural extension using relevant theoretical frameworks⁴
- be able to evaluate alternative solutions to farm-level decision problems using structured problem-solving methods⁵
- be able to design appropriate communication strategies and project-management approaches for a hypothetical advisory case⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; exercise; role play; simulations; video feedback; self-study; group work and presentation; excursion

Entrance requirements

Mandatory: None

Recommended: None

Reading list

- Munter: Guide to Managerial Communication
- Parhizgar: Multicultural Behavior and Global Business Environments
- DeVito: The Interpersonal Communication Book
- Zelazny: Say it with Charts
- Hoffmann and Christinck: Rural Extension Vol. I + II
- Leeuwis and van den Ban: Communication for Rural Innovation: Rethinking Agricultural Extension
- Ison and Russell: Agricultural Extension and Rural Development
- Friga and Rasiel: The McKinsey Mind: Understanding and Implementing the Problem-solving Tools and Management Techniques of the World's Top Strategic Consulting Firm

Examination in winter term 2026/27

graded exam: 1. written exam, 60 minutes; 2. attestation from passed exercises
certificate for exercise

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; pin-board; teaching videos; video camera

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence			X
Methodological competence		X	
Social competence	X		

last amended: May 2026

Teaching and learning methods

Lecture; seminar; exercise; self-study; group work, basic lab techniques, excursions

Entrance requirements

Mandatory: None

Recommended: Agronomy I and Animal Husbandry (AB 1 4003); Agronomy II and horticulture (AB 2 4022)

Reading list

Vaclavik and Christian: Essentials of Food Science
Campbell-Platt: Food Science and Technology
Manning: Developing Smart Agri-Food Supply Chains
Thompson: Fruit and Vegetables

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; A/V media; case studies, laboratory equipment

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

AB 3 4043 Environmental, Agricultural and Food Law
SA 5 4043 (elective module)

Study Semester: 5 (full time) **Credit Points (ECTS):** 5
 5 (part time)

Workload

Contact time		Self-study	
Lecture	30 h	Preparation for contact time	40 h
Seminar	30 h	Literature review	20 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Tobias Wünscher

Lecturers

Markus Hawickenbrauck

Teaching contents

History, principles and political background of environmental, agricultural and food law; basics of law; relevant national, European and international legal frameworks and regulations; regulatory and enforcement strategies; special aspects of environmental, agricultural and food law in Europe (e.g. property rights in agriculture, laws on agricultural inputs, administrative law, company law, criminal law, labour law); administration of environmental, agricultural and food law in Europe; compliance and non-compliance

In the seminar, students present and discuss current relevant topics based on selected literature.

Learning objectives

On successful completion of this module, students should

- be able to describe the basic legal frameworks of environmental, agricultural and food law¹
- be able to explain the relevant approaches for regulation and enforcement of agricultural, environmental and food law²
- be able to determine when and where farmers and agribusiness enterprises need to seek legal advice in the fields of environmental, agricultural and/or food law³
- be able to examine the impact of European and international law and regulations on agribusiness value chains⁴
- be able to develop a coherent legal argument or policy proposal that addresses a contemporary challenge in environmental, agricultural, or food law, integrating relevant national, European, and international regulatory frameworks⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; exercise; self-study; group work and presentation; excursion

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Bell, McGillivray: Environmental law

Fortin: Food regulation – law, science, policy and practice

Atwood, Thompson, Willett: Food law

Schneider: Food, farming and sustainability – readings in agricultural law

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; case studies; videos

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence			X
Social competence			X

last amended: May 2026

Teaching and learning methods

Lecture; self-study; group work and presentations; business case studies; simulation

Entrance requirements

Mandatory: None

Recommended: Financial Accounting (AB 2 4023)

Reading list

Weygandt et al.: Managerial Accounting
Braun and Tietz: Managerial Accounting
Horngren et al.: Introduction to Management Accounting

Examination in winter term 2026/27

graded exam: written exam, 120 minutes

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration materials; videos; computer; Excel

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; self-study; practical trials in food technology center; group work

Entrance requirements

Mandatory: None

Recommended: Agronomy I and Animal Husbandry (AB 1 4003); Agronomy II and Horticulture (AB 2 4022); Quality of Plant and Animal Products (AB 3 4042)

Reading list

Campbell-Platt: Food Science and Technology
Bylund: Dairy Processing Handbook
Fellows: Food Processing Technology
Berk: Food Process Engineering and Technology
Bender: Introduction to Nutrition and Metabolism

Examination in winter term 2026/27

graded exam: written exam, 120 minutes
certificate for lab course

Teaching materials and media

Beamer; whiteboard; flipchart; hand-outs; demonstration material; relevant equipment in food technology center; electronic learning platform (Moodle)

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026

Teaching and learning methods

Lecture; exercise; self-study; group work

Entrance requirements

Mandatory: none

Recommended: none

Reading list

International Standards ISO 9000 ff, 14000 ff, 45001, 19011, 26000, 22000, 14040
Andrews and Pardy: Integrated Management Systems
Zink: Total Quality Management as a Holistic Management Concept
Goetsch: Quality Management for Organizational Excellence: Introduction to Total Quality
Ferret, Hughes and Hughes: International Safety and Health at Work
Hauschild, Rosenbaum and Olsen: Life Cycle Assessment

Examination in winter term 2026/27

graded exam: 1. written exam, 120 minutes; 2. assignments

Teaching materials and media

Beamer; white/black board; hand-outs; flipchart; visualisation aids for presentation; demonstration material; A/V media; case studies

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 5 WPF_2 Module from any Bachelor Study Course at the Faculty of Life Sciences at Rhine-Waal University of Applied Sciences

Study Semester:	5 (full time) 5 (part time)	Credit Points (ECTS):	5
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Workload

Contact time		Self-study	
	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Peter F. W. Simon

Lecturers

All lecturers of the faculty

Teaching contents

Depending on the chosen module to be elected from any bachelor study course of faculty of Life Sciences

Learning objectives

On successful completion of this module, students should

- have acquired knowledge from other areas of the faculty and deepened or enlarged their horizon¹
- understand the importance of getting information beyond their specialisation²
- be able to implement alternative ways and approaches to problem solving³
- be able to compare contents and learning outcomes of other study courses with their own achievements⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Depending on chosen module

Entrance requirements

Depending on chosen module

Reading list

Depending on chosen module

Examination

graded exam: depends on chosen module

Teaching materials and media

Depending on chosen module

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			

last amended: May 2026

SA 6 4991 Internship or Study Abroad

Study Semester: 6 (full time)
8&9 (part time) **Credit Points (ECTS):** 30

Workload

Contact time	Self-study
Sum	Sum 900 h

Total workload: 900 h

Coordinator

Prof. Dr. Florian Wichern

Lecturers

Depends on selected activity

Teaching contents

Internship: Within the internship the students are required to work in one or more functional divisions/branches of a company to implement knowledge and methods acquired during their study courses. The students are requested to consider the coherencies of economic, social and environmental aspects. After finishing the internship, the experience gained must be summarized in a written report according to criteria defined beforehand by the student and the supervising professor. The internship can also be pursued abroad.

Study abroad: As an alternative to the internship the students may choose to study a semester at a university abroad in order to deepen their theoretical and practical knowledge. Modules at the guest university abroad should complement the modules already completed in the own degree programme. The students attend the selected classes and pass the relevant exams. On completion of their study abroad, students should be able to discuss relevant issues in a cross cultural and academic surrounding. Upon agreement of study abroad student and supervisor fix the intended outcomes. After the return experience gained must be summarized in a written report according to criteria defined beforehand by the student and the supervising professor. Upon return from study abroad the supervisor will check the written report based on the following criteria: expectations vs. the achievements actually made, validity of experiences for the studies, active learning, structuring of experiences achieved, effective competence to solve problems in an unfamiliar surrounding. Furthermore, the cross-cultural competences should be presented and discussed with the other participants of the study abroad course.

Learning objectives

Internship: The learning outcomes result from the selected activity and the business environment of companies, organisations and institutions. It is necessary that these partners and the university agree on contents and outcomes in order to allow for an appropriate coordination of the study.

Study abroad: The learning outcomes depend on where and how the study abroad is pursued. The student has to coordinate the selection of classes with the supervisor of this module for recognition of assembled ECTC. On completion of their study abroad, students should be able to discuss with other experts in a cross cultural and academic surrounding. At the same time students should improve their language skills in an authentic surrounding.

- The students learn to consider the social impact of professional decisions^{2,3} and thus deepen their capacity to engage in society^{2,3}

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Depends on selected activity

Entrance requirements

Mandatory: Minimum of 90 ECTS and all modules of the first 2 semesters

Recommended:

Reading list

Depends on selected activity

Examination

Internship: written report

Study abroad: successful completion of 15 ECTC; written report; presentation to supervisor of study abroad

Teaching materials and media

Depends on selected activity

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence		X	
Methodological competence		X	
Social competence		X	

last amended: May 2026

SA 7 4995 Applied Excursions

AB 7 4195

Study Semester: all (full time)
all (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
Lecture		Preparation for contact time	30 h
Seminar		Literature review	
Exercise	120 h	Preparation for exams	
Sum	120 h	Sum	30 h

Total workload: 150 h

Module coordinator

Prof. Dr. Matthias Kleinke

Lecturers

All lecturers of the faculty

Teaching contents

Principles and concepts of farming regionally and internationally; different concepts of land use; land use diversity; sustainability of farming systems; technologies in farming and food processing; regional and international markets, business models and economics of land use and food systems; agri-food supply and value chains; agribusiness management and logistics; development and social interactions in rural areas; sustainability management, environmental and agricultural policy; nature conservation and farming

Learning objectives

On successful completion of this module, students should

- have acquired and broadened their discipline-specific knowledge^{1,3,4}
- know the principles of different farming systems regionally and internationally¹
- understand the conceptual and practical differences between types of farming and land use²
- be able to critically discuss economic, social and ecological aspects of different farming approaches and land use systems⁴
- be able to analyse the scientific/academic and societal relevance of the behaviour of all actors in the supply chain⁴
- be able to evaluate the ecological sustainability, social integrity and economical profitability of different agricultural, land use and food systems⁵

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Lecture; seminar; self-study; group work; excursion; case studies; lab course; field trip

Entrance requirements

Mandatory: None

Recommended: None

Reading list

Various literature for the preparation of the respective topic possible

Examination

certificate for participation in a total of 100 hours excursions

Certificates of participation are awarded and collected on each excursion depending on duration and effort.

Teaching materials and media

Excursion; beamer; group work; hand-outs; demonstration material; A/V media

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence	X		

last amended: May 2026

SA 7 4971 Project reg. Academic Principles and Methods in Preparation of Bachelor Thesis (elective module)

Study Semester: 7 (full time)
10 (part time) **Credit Points (ECTS):** 10

Workload

Contact time		Self-study	
Project practice-oriented	30 h	Preparation for contact time	20 h
		Literature review	50 h
		practical, scientific work	180 h
		writing project report	20 h
Sum	30 h	Sum	270 h

Total workload: 300 h

Module coordinator

Prof. Dr. Matthias Kleinke

Lecturers

all lecturers of the faculty

Teaching contents

The student should be prepared for his or her bachelor thesis through applied research. As a rule, the intended supervisor of the thesis will enable the student to gain theoretical and practical experience by working independently on a scientific topic that is preferably close to the planned thesis. All aspects of scientific work are taken up here, i.e. in addition to practical work (e.g. in the laboratory), in particular literature studies on the content and methodological preparation of the topic, experiment planning, scientifically appropriate documentation and writing of a final report, as well as presentation of the (interim) results in status seminars and oral final presentation if necessary.

The planned workload of 300 hours is to be completed as a rule during a continuous period of 6 weeks after completion of the internship, whereby the contact time and self-study portions can vary depending on the type of research activity. The figures given in the above table are therefore to be understood as a guideline.

The project for the preparation of the Bachelor's thesis can also be carried out in the company of the internship.

Learning objectives

On successful completion of this module, students should

- be able to work independently with scientific literature³
- be able to apply methods of theoretical and scientific work^{1,3}
- be able to correctly document scientific work³
- have deepened their specialist knowledge on specific topics^{1,3,4}
- have expanded their ability to work in a team³

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

practical scientific work

Entrance requirements

Mandatory: None

Recommended: Internship or study abroad (SA 6 4991); relevant basic courses of the semesters 1–5 according to the choice of topic

Reading list

Depending on the chosen subject area, scientific literature is made available by the supervisor or procured by the student.

Examination

certificate: depends on chosen project

Teaching materials and media

Relevant subject-related literature; if applicable, relevant laboratory equipment

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence		X	

last amended: May 2026

SA 550 Language Course for Students (without and with previous knowledge) (elective module)

Study Semester: 1–7 (winter term/summer term)

Credit Points (ECTS): 5

Workload

Contact time		Self-study	
Language course	52 h	Preparation for contact time	20 h
		Mandatory Exercises Moodle/ Self study	58 h
		Preparation for exams	20 h
Sum	52 h	Sum	98 h

Total workload: 150 h

Module coordinator

CIL: Office of Languages and Intercultural Communication

Lecturers

Ratka Sozovska, Corinna Roth and freelance lecturers

Teaching contents

Module contents are based on the “can-do statements” of the Common European Framework of Reference for Languages (CEFR) for the levels A1–B2. All four skills areas – Listening, Speaking, Reading, Writing – are practiced.

Learning objectives

The main objective of these modules is to develop students' verbal and written communication skills as well as to impart to them effective general learning and communication strategies. Upon successful completion of these modules, students should be able to navigate common everyday situations using linguistic means of communication according to the respective level.

- 1 2 3

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Classroom instruction; mandatory exercises in Moodle; self-study

Entrance requirements

Further information can be found in the “Module Guide for Credit-Bearing Language Courses” on the HSRW homepage.

Reading list

Further information can be found in the “Module Guide for Credit-Bearing Language Courses” on the HSRW homepage.

Examination

certificate: see the module description provided by the International Centre

Teaching materials and media

Beamer; white/black board; hand-outs; visualisation aids for presentation; demonstration material;
Webex

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence		X	
Methodological competence			X
Social competence	X		

last amended: May 2026

SA 7 WPF_3 Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences

Study Semester: 7 (full time)
5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Peter F. W. Simon

Lecturers

All lecturers of the university

Teaching contents

Depending on the chosen module to be elected from any bachelor study course of Rhine-Waal University

Learning objectives

On successful completion of this module, students should

- have acquired knowledge from other areas of the university and deepened or enlarged their horizon¹
- understand the importance of getting information beyond their specialisation²
- be able to implement alternative ways and approaches to problem solving³
- be able to compare contents and learning outcomes of other study courses with their own achievements⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Depending on chosen module

Entrance requirements

Depending on chosen module

Reading list

Depending on chosen module

Examination

graded exam: depends on chosen module

Teaching materials and media

Depending on chosen module

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

SA 7 WPF_4 Module from any Bachelor Study Course at Rhine-Waal University of Applied Sciences

Study Semester: 7 (full time)
5 (part time) **Credit Points (ECTS):** 5

Workload

Contact time		Self-study	
	60 h	Preparation for contact time	30 h
		Literature review	30 h
		Preparation for exams	30 h
Sum	60 h	Sum	90 h

Total workload: 150 h

Module coordinator

Prof. Dr. Peter F. W. Simon

Lecturers

All lecturers of the university

Teaching contents

Depending on the chosen module to be elected from any bachelor study course of Rhine-Waal University

Learning objectives

On successful completion of this module, students should

- have acquired knowledge from other areas of the university and deepened or enlarged their horizon¹
- understand the importance of getting information beyond their specialisation²
- be able to implement alternative ways and approaches to problem solving³
- be able to compare contents and learning outcomes of other study courses with their own achievements⁴

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Depending on chosen module

Entrance requirements

Depending on chosen module

Reading list

Depending on chosen module

Examination

graded exam: depends on chosen module

Teaching materials and media

Depending on chosen module

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence		X	
Social competence			X

last amended: May 2026

Study Semester:	7 (full time) 11 (part time)	Credit Points (ECTS):	12
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Workload

Contact time		Self-study	
Sum		Sum	360 h

Total workload: 360 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

All lecturers of the faculty

Teaching contents

The contents of the bachelor thesis are specific and have to be coordinated with the chosen/elected instructor/lecturer. The assigned task will be adequately described and documented as well as the chosen approach, methodology and results.

Learning objectives

On successful completion of this module, students should

- demonstrate that they are able to complete a praxis-oriented task from their field of study without help and within an allotted period of time³
- be able to implement technical knowledge in a scientifically appropriate way^{3, 4}
- be able to structure the necessary processes and tasks necessary for solving the conceptual formulation, control their progress and adjust if necessary³
- be able to document their starting point, the chosen approach and their findings in such a way that they fulfil the requirements of a scientific publication³

¹Knowledge; ²Comprehension; ³Application; ⁴Analysis; ⁵Synthesis and judgement

Teaching and learning methods

Entrance requirements

Mandatory: Minimum of 180 ECTS

Recommended:

Reading list

Depending on chosen subject/task

Examination

graded exam: written thesis of approx. 40–100 pages

Teaching materials and media

specific

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			

last amended: May 2026

SA 7 4994 Colloquium

Study Semester:	7 (full time) 11 (part time)	Credit Points (ECTS):	3
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Workload

Contact time		Self-study	
Sum		Sum	90 h

Total workload: 90 h

Module coordinator

Prof. Dr. Florian Wichern

Lecturers

All lecturers of the faculty

Teaching contents

The content of the colloquium is based on the bachelor thesis.

Learning objectives

The students present the results of their bachelor thesis during the colloquium. They put their research and findings in a context with the practical approach and present their findings in a scientific and structured way. The students justify their chosen approach autonomously by taking into consideration how far their results were influenced by assumptions/presuppositions and simplifications. They are able to analyze questions regarding their thesis and their findings and to answer these within the frame of the technical and non-technical context.

Teaching and learning methods

Entrance requirements

Mandatory: Minimum of 207 ECTS

Recommended:

Reading list

Examination

graded exam: presentation and oral exam, max. 45 minutes

Teaching materials and media

specific

Areas of competence

Area of competence	Core area	Partly relevant	Of minor relevance
Professional competence	X		
Methodological competence	X		
Social competence			X

last amended: May 2026