Modulhandbuch

Course Book

M.Sc. Agricultural and Food Economics (AFECO)

Studienbeginn ab WS 2020/2021

Beginning of studies from WS 2020/2021

Modul-Übersicht/ Directory of modules

Abkürzungen/Abbreviations:

Häufigkeit/Course cycle

SS=Sommersemester/Summer semester

WS=Wintersemester/Winter semester

Verwendbarkeit des Moduls/Study program allocation

P/C=Pflichtmodul/Compulsory

WP/E=Wahlpflichtmodul/Elective

fWP/O=freies Wahlpflichtmodul/Optional

PM=Projektmodul/Project module

Lehr- und Lernformen/Teaching and learning methodes

V/L=Vorlesung/Lecture

Ü/T=Übung/Tutorial

S=Seminar

P=Praktikum/Practical training

E=Exkursion/Excursion

prÜ/pT=praktische Übung/ Practical course

PS=Projektseminar/Project seminar

T/sT=Tutorium/Student tutorial

K/C=Kolloquium/Colloquium

AG/SG=Arbeitsgemeinschaft/Study group

B-Arb/BT=Bachelorarbeit/Bachelorthesis

M-Arb/MT=Masterarbeit/Masterthesis

Mit Asterisk (*) gekennzeichnet: Lehrveranstaltungen, für die gemäß § 13 Abs. 6 der POO als Voraussetzung für die Teilnahme an Modulprüfungen die verpflichtende Teilnahme festgelegt ist. Die Pflicht zur Teilnahme besteht dann zusätzlich zu etwaigen sonstigen aufgeführten Studienleistungen.

Marked with an asterisk (*): Courses for which, in accordance with § 13 Paragraph 6 of the POO, compulsory attendance is specified as a prerequisite for taking module examinations. The compulsory attendance then exists in addition to any other listed academic achievements.

Compulsory modules

30 ECTS-CP must be completed.

Module Title: Extended Methods of Empirical Research

Module ID/Code: BAS-110 [780761110]

1. Content and intended learning outcomes

Learning content:	Ethics in empirical research Quantitative Research Introduction into R; statistical distribution theory; Bayes theorem; refresher matrix algebra for statistical analysis; linear regression analysis and Gauss Markov theorem; use of non-metric (dummy) variables; logistic regression; inference and hypothesis testing; time trend analysis Qualitative Research Research in Social Science; philosophy of science; key aspects of qualitative research; grounded theory; methods of qualitative research (observation, interview, focus groups); application of qualitative research

Learning outcomes

After a successful completion of the course, the students…
- can describe ethical codes in empirical research.
- explain the concepts of statistical distribution theory and understand Bayes theorem.
- comprehend the theoretical basics of linear regression and logistics regression.
- can prepare data for analysis and perform empirical research using OLS.
- are able to generate and test hypotheses (t-test, F-test and Anova) and to interpret p-values.
- are able to perform a trend analysis for typical time series data along the agri-food chain.
- will be able to interpret statistical software outputs.
- can explain major epistemological approaches in social science, different ways of scientific reasoning and the basic assumptions of critical rationalism and the positivism dispute.
- are able to describe the key aspects and quality criteria in qualitative research and how it differentiates from quantitative research.
- can summarize different methods of qualitative research.
- will be able to discuss a research topic in a group, develop a qualitative survey and apply a Grounded Theory approach to analyze interview data.
- will be able to interpret, reflect on study results and present those.

2. Prerequisites

obligatory	
recommended	Introductory course in methods of empirical research
Maximum number of students	60 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	1.+2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Quantitative Methods	English	60	2,0	30,0	45,0
T*	during the semester	Quantitative Methods: Exercises with R	English	30	2,0	30,0	75,0
L	during the semester	Qualitative Methods	English	60	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS+SS	270	2	9,0

Module Title: Extended Methods of Empirical Research				
Module ID/Code: BAS-110 [780761110]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [780761119]		graded	English	67%
Assignment [780761118]	Contributions to group and team submissions e.g. research question, interview guides, reports or term papers, presentations. Will be verified through a common group work protocol., Regular and active participation in group meetings, group discussions.	graded	English	33%
Academic Achievements				
10. Module coordination				
Module coordinator				
Prof. Dr. Monika Hartmann				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
The computer Lab is necessary for the exercises with R (see above)				

Module Title: Excursion in Agricultural and Food Economics

Module ID/Code: BAS-120 [780761120]

1. Content and intended learning outcomes

Learning content:	Visits to farms, to enterprises along the food chain, to institutions relevant to agricultural and food economics and policy; Preparation of presentations about and background information to contemporary problems and settings, future challenges and sustainability. Discussion of topics related to the research programs of the ILR, and the faculty.

Learning outcomes

After a successful completion of the course, the students…
- are able to identify main issues that are sector-relevant.
- are able to present sector-relevant information in a condensed manner.
- have the ability to discuss sector-relevant future challenges.
- can link information of different perspectives and teaching modules to explain real situations in agriculture, in the food chain and in rural areas, to discuss future challenges.
- are able to transfer knowledge into practice.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	1.+2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
E* (blocked)	full-day block	Excursions, lasting 1 to 5 days to domestic and international destinations	English	40	3,0	48,0	62,0
S*	during the semester	Excursion background block seminar	English	60	1,0	20,0	50,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS+SS	180	2	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none		not graded		

Academic Achievements

- In total participation in and proof of five days of excursion
- Two active pre-excursion presentations: one poster presentation and one presentation in free format
- Active participation in discussions on the excursion and pre-excursion presentations

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Microeconomics

Module ID/Code: BAS-130 [780761130]

1. Content and intended learning outcomes

Learning content:	Choice and demand: utility maximization, expenditure minimization, Slutsky equation market demand, welfare measures Product supply and factor demand: production functions, cost minimization, profit maximization Coordination of supply and demand through - competitive markets for products and primary factors - Strategic interaction (game theory), common pool recources, imperfect competition

Learning outcomes

After a successful completion of the course, the students…
- are able to explain the neoclassical theory of supply, demand and markets at a formal mathematical level.
- are able to formulate and solve unconstrained and constrained optimization problems and apply optimization tools to solve quantitative economic problems.
- analyse the description of economic decision problems and choose and apply the appropriate tool from set of possibilities.
- learned to apply calculus and spreadsheet tools to economic decision problems.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Microeconomics	English	120	3,0	45,0	60,0
T		Microeconomics	English	50	1,0	15,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780761139]		graded	English	50%
Assignment [780761138]		graded	English	50%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Organizational Management

Module ID/Code: BAS-140 [780761140]

1. Content and intended learning outcomes

Learning content:	Participants are able to apply theory concepts of management and organization to the particularities of the enterprises and chains that are operating mainly in the sectors of agriculture, food and supporting industries. Moreover, participants will have to compare, present and discuss different seminal scientific articles stemming from the domains of Strategic Management (e.g. Resource-based view), Organizational Management (e.g. Value chain analysis), Entrepreneurship (e.g. business models) and related areas. These theory concepts are also applied and discussed to case studies drawn from leading international business schools (e.g. Harvard Business School).

Learning outcomes

After a successful completion of the course, the students…
- are able to recall and describe the main theories constituting the pillars of management and organization.
- can relate various theoretical approaches and views and recognise differences and similarities among them.
- can extract relevant information from scientific literature and relate practical industrial cases with the theory.
- can summarise and discuss scientific management literature.
- illustrate the fields of applications of various theories and give examples thereof.
- identify managerial problems, find potential solutions, and formulate an action strategy.
- are able to illustrate case studies as well as relate managerial theories with "real world" examples.
- select and apply the most approapriate strategic tools to practical managerial cases.
- summarise scientific articles and present them in class.
- are able to compare different theoretical management approaches.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	50 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	50	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Presentation [780761149]		graded	English	33%
Assignment [780761148]		graded	English	67%

Academic Achievements

Module Title: Organizational Management
Module ID/Code: BAS-140 [780761140]
10. Module coordination
Module coordinator
Dr. David Antons
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Harvard cases (Harvard Business School) need to be bought, approx 5 € / case

Module Title: Risk Management in the Agribusiness

Module ID/Code: BAS-150 [780761150]

1. Content and intended learning outcomes

Learning content:	Different concepts of risk measures and risk management; risk management instruments in the agricultural and food sector; theoretical concepts addressing risk in decision making; accompanying exercises and case studies

Learning outcomes

After a successful completion of the course, the students…
- identify different types of risks in the agri-food sector.
- discuss and apply different risk measures.
- classify and critically discuss the role of risk for current issues in the agri-food sector.
- name important risk management tools for the agri-food sector and understand their function.
- understand relevant theories and concepts for decision-making under risk.
- apply theories and concepts of decision-making under risk and risk management to relevant issues using empirical methods (and software).

2. Prerequisites

obligatory	
recommended	Extended Methods of Empirical Research (BAS-110)
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Risk Management Lecture	English	50	1,0	14,0	22,0
T		Risk Management Practical	English	50	1,0	14,0	40,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	90	1	3,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [90 min] [780761157]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Niklas Möhring

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Major or Minor Agribusiness (ABS)

Requirements for the Major Specification:
- Modules accounting for a minimum of 30 ECTS-CP in the Major Specification
- The Research Seminar is in the Major Specification
- The Master Thesis is in the Major Specification

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: Financial Accounting

Module ID/Code: ABS-100 [780762100]

1. Content and intended learning outcomes

Learning content:	Students learn about the annual financial statements as required by German commercial law (HGB) and as proposed by the Agricultural Ministry for farms. A deeper insight into Accounting is offered. Students will understand the balance sheet and the financial statement of a firm, being able to analyse it for rentability, solvency and stability of a firm.

Learning outcomes

After a successful completion of the course, the students…
- are able to solve accounting tasks.
- assign the legal frame to accounting.
- analyse annual financial statements.
- identify key figures (financial ratios) from financial statements.
- rate the economic situation of firms.

2. Prerequisites

obligatory	
recommended	Bachelor course in Financial Accounting like Ökonomie II offered in Bonn
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.
M.Ed. Agricultural Science (Teacher's Training)	E	2.
M.Ed. Agricultural Science (Teacher's Training)	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Financial Accounting	German	15	2,0	28,0	62,0
T	during the semester	Accounting and analyzing financial statements	German	15	2,0	28,0	62,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [90 min] [780762107]	Presentation	graded	German	

Academic Achievements

10. Module coordination

Module coordinator

Dr. Hermann Trenkel

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Methods in Management Research

Module ID/Code: ABS-120 [780762120]

1. Content and intended learning outcomes

Learning content:	This course provides an introduction to various qualitative and quantitative research methods which are particularly relevant for management research, whether in an academic or corporate setting. Some examples of these methods are surveys, means-end chain modeling, social network analysis, patents and data analysis, group concept mapping, structural equation modeling, choice modelling, and science-fiction prototyping. In this way, the course is set up to both introduce and facilitate the application of these methods for a range of relevant units of analysis: products, processes, companies, entire supply chain, or even the broader development of technology innovation systems in the setting of agribusiness. Where applicable, students will also become acquainted with relevant softwares and databases, all with the goal of being able to use these methods for conducting their own studies in the field of management. This course is especially recommended for students interested in a master thesis with the Chair of Technology and Innovation Management in Agribusiness.

Learning outcomes

After a successful completion of the course, the students…
- will be able to identify and typify relevant research problems for various contexts of the agribusiness sector.
- will be able to independently compare and distinguish among different types of research methods.
- will be able to implement research problems and methods to obtain accurate and informative results.
- will be able to analyse (qualitative or quantitative) data, and discuss important findings of their research.
- will be able to assess, evaluate and justify their choice of research methods for answering research questions.
- will be able to independently conduct studies, from formulating their research questions to discussing results.

2. Prerequisites

obligatory	
recommended	BAS-110 Extended Methods of Empirical Research
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Applied Planning Methods in Agribusiness	English	25	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780762129]		graded	English	50%
Oral exam [780762128]		graded	English	50%

Academic Achievements

Module Title: Methods in Management Research
Module ID/Code: ABS-120 [780762120]
10. Module coordination
Module coordinator
Dr. David Antons
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Not offered in WS 23/24

Module Title: Investment and Financing

Module ID/Code: ABS-130 [780762130]

1. Content and intended learning outcomes

Learning content:	Planning and evaluation of single investment projects using dynamic concepts; simultaneous planning of investment and financing, overview and analysis of typical and novel, sustainable investment projects in the agricultural and food sector; financial management and evaluation in the agricultural and food sector; evaluating investments under uncertainty

Learning outcomes

After a successful completion of the course, the students…
- understand theoretical concepts for the assessment of investment and financing decisions, critically reflect on them and apply them to typical problems of agricultural enterprises.
- identify and quantify risks for investments in agriculture.
- Understand and critically reflect on relevant concepts for investments under risk and apply them to relevant examples from agriculture.
- recognize the relevance of the concepts learned for current issues in agriculture (e.g., sustainability and resilience).
- understand investment decisions in new, agriculture-related instruments and concepts ("investments in nature"), and analyze and critically reflect on their implementation and societal costs and benefits.

2. Prerequisites

obligatory	
recommended	Risk Management in Agribusiness, Microeconomics, Extended Methods of Empirical Research, Agricultural Production Economics
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Ed. Agricultural Science (Teacher's Training)	E	3.
M.Ed. Nutrition Science and Home Economics (Teacher's Training)	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Investment	English	40	1,5	23,0	47,0
L (blocked)	full-day block	Financing (optional in German)	German	40	0,5	8,0	12,0
T	during the semester	Investment	English	40	2,0	30,0	60,0
L	during the semester	Financing	English	40	0,5	8,0	12,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [90 min] [780762139]		graded	English	

Academic Achievements

Module Title: Investment and Financing
Module ID/Code: ABS-130 [780762130]
10. Module coordination
Module coordinator
Prof. Dr. Niklas Möhring
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Dr. Gerd Wesselmann (former director of WGZ Bank) teaches only in German. An English alternative is offered.

Module Title: Agricultural Production Economics

Module ID/Code: ABS-210 [780762210]

1. Content and intended learning outcomes

Learning content:	Fundamentals of agricultural production economics and management; factors influencing the operational outcome and sustainability of farms; theoretical and applied efficiency and productivity analysis; management challenges related to agricultural production; farm production organization.

Learning outcomes

After a successful completion of the course, the students…
- understand the fundamental theories and concepts of agricultural production economics.
- understand and critically reflect on the relevance of theories and concepts for important current issues in agriculture (e.g., transformation to sustainable and resilient production systems).
- integrate interdisciplinary insights (e.g. from agronomy or ecology) into models and theories of production economics.
- critically question the limits of the introduced fundamental theories and concepts and understand approaches that go beyond them.
- apply the theories, concepts and models they have learned theoretically, algebraically and empirically to relevant problems of agricultural production.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theory	English	30	2,0	28,0	42,0
T	during the semester	Application	English	30	2,0	28,0	82,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [90 min] [780762219]		graded	English	

Academic Achievements

Module Title: Agricultural Production Economics
Module ID/Code: ABS-210 [780762210]
10. Module coordination
Module coordinator
Prof. Dr. Niklas Möhring
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Strategic Technology and Innovation Management

Module ID/Code: ABS-230 [780762230]

1. Content and intended learning outcomes

Learning content:	The main focus of this course relates to the ability of organizations to innovate, including the tools, frameworks, processes, strategies, and structures that are relevant. Thus, this course will provide a detailed overview of strategic technology and innovation management tools; explore how these help to support and design the management of innovative projects and organizations; assist in the creation of an innovation-oriented and innovation-supporting environment; and facilitate the development and evaluation of appropriate strategies for the implementation of new product and technology development processes. Discussion of how to appropriately utilize tools for the development and implementation of strategic innovation concepts in the context of agribusiness receives specific emphasis, by means of case-study discussions, in-class assignments, guest lectures, and, ultimately, the generation of a unique business model as part of an end-of-semester design-thinking workshop.

Learning outcomes

After a successful completion of the course, the students…
- interpret, explain, and summarize relevant issues and stages of new product management and development.
- characterize and classify different forms and types of innovations in the context of agribusiness.
- execute and apply corporate foresight and technology forecasting tools, such as patent analysis.
- differentiate and attribute types of innovation strategies alongside their fit within specific organizational structures.
- summarize and organize the challenges and opportunities of open innovation in the context of agribusiness, including with regard to management of intellectual property.
- summarize and provide examples of the various ways to structure innovation processes, as well as compare and contrast these from one another.
- classify and differentiate the various sources of innovative ideas as well as their relative suitability for distinct types of projects and within different organizations.
- critically apply and appraise conceptual tools and frameworks toward the analysis of relevant cases from agribusiness.
- generate potential business models and evaluate and explore the needs of customers in the context of agribusinessby means of design-thinking approaches.

2. Prerequisites

obligatory	BAS-140 Organizational Management
recommended	
Maximum number of students	15 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Strategic Technology and Innovation Management in Agribusiness	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report [780762239]	Project Report	graded	English	30%
Oral exam [780762238]		graded	English	70%

Academic Achievements

Module Title: Strategic Technology and Innovation Management
Module ID/Code: ABS-230 [780762230]
10. Module coordination
Module coordinator
Dr. David Antons
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Seminar Economics of Sustainable Agricultural Production Systems

Module ID/Code: ABS-300 [780762360]

1. Content and intended learning outcomes

Learning content:	Case studies related to agri-business and productivity analysis and planning problems, application of efficiency analysis and implementation with statistical software.

Learning outcomes

After a successful completion of the course, the students…
- name and critically reflect on relevant challenges for agricultural production systems and their sustainability and resilience.
- apply the relevant theories and methods in the field of production economics and decision theory to problems of agricultural production and the food value chain.
- develop, evaluate and implement research designs to answer specific research questions using the appropriate quantitative methods.
- discuss empirical results and relate them to current scientific literature and discuss and derive societal implications.Forschungstechniken wie die Strukturierung eines Planungsproblems, die Datenerfassung und das Datenmanagement anwenden.

2. Prerequisites

obligatory	Passed exam in module BAS-110 and one of the modules BAS-130 or ABS-210
recommended	
Maximum number of students	12 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S	during the semester		English	12	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report (presentation) [780762369]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Niklas Möhring

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Seminar in Innovation Management and Entrepreneurship

Module ID/Code: ABS-310 [780762310]

1. Content and intended learning outcomes

Learning content:	Participants learn how to prepare presentations related to the specific topics focused on technology and innovation management as well as Entrepreneurship in the domain of life sciences and sustainability transition. They learn how to lead and moderate discussions and to conceptualize a managerial system for problem support in enterprises, institutions and other organizations in the future. They learn how to select an appropriate theoretical framework on the specific research topic and how to deliver a consistent report on it.

Learning outcomes

After a successful completion of the course, the students…
- are able to identify significant scientific literature and relate it to a specific topic.
- understand and classify cross-wise information from scientific literature.
- are able to collect and organise scientific content to produce an original contribution both in form of a presentation and a paper.
- can lead and moderate a discussion about leading edge topics.
- are able to produce a scientific review paper.

2. Prerequisites

obligatory	BAS-140 Organizational Management
recommended	
Maximum number of students	15 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S	during the semester		English	25	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report (presentation) [780762319]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Dr. David Antons

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Special Project in Technology and Innovation Management

Module ID/Code: ABS-320 [780762320]

1. Content and intended learning outcomes

Learning content:	Research project in line with a topic from the field of "Technology and Innovation Management in Agribusiness". Specific topic and form of deliverable (paper, report, poster, documentation,...) to be agreed upon between student and coordinator.

Learning outcomes

After a successful completion of the course, the students…
- obtain deep knowledge of selected technology and innovation management issues.
- enhance their understanding of managerial and strategic concepts.
- achieve skills in literature and data analysis.
- are able to apply theories, tools and methods from the innovation management domain to current societal and economic debate.

2. Prerequisites

obligatory	BAS-140 or ABS-230 with 1.3 or better have to be completed at the start of this module
recommended	ABS-120 Methods in Management Research
Maximum number of students	3 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
PS	during the semester	Special project	English	3	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Project work [780762329]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Dr. David Antons

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Not offered in WS 22/23

Module Title: Special Project in Production Economics

Module ID/Code: ABS-340 [780762340]

1. Content and intended learning outcomes

Learning content:	Special research-oriented project work for early stage research projects mutually agreed upon between student and coordinator. Topics are from the field of production economics, where interdisciplinary research topics are encouraged. Form of deliverable (paper, report, poster, documentation,…) to be agreed upon between student and coordinator in the first two weeks.

Learning outcomes

After a successful completion of the course, the students…
- define a relevant research question for current challenges in agricultural production.
- develop an analytical framework to answer it.
- discuss results, identify shortcomings of the approach used and suggest possible solutions.

2. Prerequisites

obligatory	ABS-210 with 1.3 or better and APO-230 with 1.7 or better have to completed at the start of this module
recommended	BAS-110 Extended Methods of Empirical Research
Maximum number of students	3 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
PS	during the semester		English	3	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Project work [780762349]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Niklas Möhring

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Specific form of report (paper, data and technical documentation) to be agreed upon between student and coordinator within the first two weeks.

Module Title: Bio-Economic Modelling At Farm-Scale

Module ID/Code: ENV-240 [780764240]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are farm-scale simulation models?
2. Introduction to Linear Programming
2.1 Assumptions of Linear Programming
2.2 Primal and dual solution
3. Introduction to GAMS
3.1 Language structure
3.2 A first simple GAMS model of a farm
4. Modelling core bio-economic interactions at farm scale
4.1 Herd dynamics, requirements and cost minimal feed mix
4.2 Crops, rotations, cropping intensity
4.3 Labour use
4.4 Combing the elements, integrating environment indicators
5. Modeling Investments and Financing Decisions
5.1 Maximizing Net Present Value
5.2 Accounting for depreciation
5.3 Indivisibilities in investments
5.4 Full financial plan and income tax
6. Modeling Risk and risk behavior
6.1 State of nature, decision under uncertainty, MOTAD and Target MOTAD
6.2 State contingent decision variables
6.3 Dynamic stochastic programming

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of farm-scale bio-economic models and describe the interactions inside and between various sub-systems inside a farm as expressed in a formal optimization model.
- will be able to write simple or change more complex farm-scale bio-economic models in the software package GAMS.
- will be able to analyze the outcome of such a model against the background of micro-economic theory.
- will be able to evaluate the impact of drivers of farm management decisions such as changes in input/output prices or farm-scale policies on economic and environmental indicators based on the application of a bio-economic model.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS-130 and a course on risk management such as BAS-150. Both courses are obligatory in the AFECO program.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

Module Title: Bio-Economic Modelling At Farm-Scale				
Module ID/Code: ENV-240 [780764240]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Term paper [780764249]		graded	English	
Academic Achievements				
10. Module coordination				
Module coordinator				
PD Dr. Wolfgang Britz				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.				

Module Title: Food Marketing

Module ID/Code: MAC-100 [780765100]

1. Content and intended learning outcomes

Learning content:	Marketing Concept: Gain insights into the impact of marketing (attitudes, behaviour change, conditioning, external influences), neuromarketing, the role of the competitive environment (information technology, concentration, sourcing cooperations, competition, buyer power, vertical integration), the marketing fields of action (product, price, distribution and promotion) with specific focus on food enterprises. Marketing management: Apply marketing stragegies (e.g. brand portfolio strategy, segmentation policy) in a competitive environment using an interactive simulation game, analyze and evaluate market information based on research studies for the development of marketing strategies.

Learning outcomes

After a successful completion of the course, the students…
- can describe relevant psychological and sociological constructs to understand the impact of marketing.
- have an overview on competitive conditions in food markets with a focus on German food markets.
- know the marketing fields of action and opportunities to apply instruments in the competitive surrounding of food markets.
- explain the differences in the impact of marketing strategies depending on the market environment (e.g. market structure).
- can analyse consumer reactions based on psychological and sociological constructs.
- are able to analyse developments in food value chains.
- able to develop and implement marketing strategies at firm level in a highly competitive environment.
- are able to analyze and interpret market information based on research studies.
- are able to present, discuss and defend marketing strategies implemented.

2. Prerequisites

obligatory	
recommended	Knowlege about the food sector
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Marketing	English	20	2,0	30,0	50,0
T	during the semester	Marktstrat Simulation Game	English	20	2,0	30,0	70,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780765109]		graded	English	60%
Presentation [780765108]		graded	English	40%

Academic Achievements

Module Title: Food Marketing
Module ID/Code: MAC-100 [780765100]
10. Module coordination
Module coordinator
Jeanette Klink-Lehmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Food security and sustainable food systems

Module ID/Code: APO-260 [780763260]

1. Content and intended learning outcomes

Learning content:	Students will learn to look at agriculture and nutrition through a food systems lens and understand synergies and tradeoffs between human health and planetary health goals. Concepts and measurement of food security, dietary quality, and the triple burden of malnutrition, as well as related policy interventions, will be discussed. Links between agriculture, biodiversity, climate change, diets, nutrition, and health will be analyzed from a global perspective and with empirical examples from low-, middle-, and high-income countries. Case studies will be used to evaluate specific food systems topics from a comprehensive sustainable development perspective. Case studies will include topics such as organic farming, GMOs, meat consumption, palm oil, nutrition-sensitive agriculture, and the supermarket revolution, among others.

Learning outcomes

After a successful completion of the course, the students…
- are able to define key terms related to food security and sustainable diets.
- can explain how food systems relate to the various sustainable development goals (SDGs).
- can identify policy needs and analyze the sustainability implications of specific interventions.
- can evaluate the arguments in the public debate around sustainable agriculture and nutrition.
- can construct and use dietary surveys and nutrition assessment tools.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	3.
M.Sc. Nutrition Science	E	3.
M.Sc. Molecular Food Technology	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	120	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763269]		graded	English	

Academic Achievements

Module Title: Food security and sustainable food systems
Module ID/Code: APO-260 [780763260]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Probabilistic Programming for Applied Agricultural Economics

Module ID/Code: APO-320 [780763320]

1. Content and intended learning outcomes

Learning content:	Students learn to apply Probabilistic Programming to answer quantitative causal research questions. Probabilistic Programming is a novel data science tool combining Bayesian Statistical Modelling, elements of Machine Learning, and standard econometrics. The course contributes to the master's degree by deepening student's quantitative skills and extending their methodical toolkit. Students will learn a basic workflow to perform theory-guided, applied statistical analysis of questions relevant to policy and business. The workflow is intensively practiced with guided coding examples and exercises (in Python and the NumPyro framework). Along the way, the course covers the basics of Bayesian modeling and how to interpret Bayesian modeling results. The course contributes to student's skills relevant to data analytic jobs in research or the private sector.

Learning outcomes

After a successful completion of the course, the students…
- are able to interpret Bayesian modeling results.
- are able to compute statistics of interest from Bayesian model results.
- are able to apply Probabilistic Programming for their own empirical application (e.g. the Master Thesis or following data science projects).
- are able to explain and evaluate the benefits of (Bayesian) Probabilistic Programming approaches compared to other commonly applied econometric approaches.
- have obtained (python) coding experience and data science skills beneficial for the future academic or private sector job market.

2. Prerequisites

obligatory	none
recommended	One of either APO-230 or ENV-130
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theory	English	20	2,0	30,0	60,0
pT	during the semester	Application	English	20	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763329]		graded	English	

Academic Achievements

Module Title: Probabilistic Programming for Applied Agricultural Economics
Module ID/Code: APO-320 [780763320]
10. Module coordination
Module coordinator
Dr. Hugo Storm
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Guided coding examples and exercises will be provided in Python, but no previous Python experience is required. It is sufficient that students have gained some previous experience in coding in general, for example by completing either APO-230 or ENV-130 (both using R) successfully. Nevertheless, a strong interest and motivation to learn Python basics is expected. Background Links: - Ghahramani, Zoubin. 2015. “Probabilistic Machine Learning and Artificial Intelligence.” Nature 521 (7553): 452–59. - McElreath, Richard. 2020. Statistical Rethinking: A Bayesian Course with Examples in R and Stan. Chapman and Hall/CRC. - Thomas Heckelei, Hugo Storm, Kathy Baylis. 2023. Probabilistic Programming for Embedding Theory and Quantifying Uncertainty in Econometric Analysis. Keynote, XVII EAAE Congress 2023 Rennes. https://github.com/hstorm/pp_eaae_rennes - NumPyro Documentation: https://num.pyro.ai/en/stable/

Module Title: Satellite Data in Agricultural Economics

Module ID/Code: ENV-320 [780764320]

1. Content and intended learning outcomes

Learning content:	Introduction and Overview, a primer on satellite data, opportunities arising from satellite data, what can be measured with satellite data, pitfalls, impact evaluations using satellite data, final discussion and conclusion.

Learning outcomes

After a successful completion of the course, the students…
- are able to work with data in Google Earth Engine and in R.
- understand potentials and pitfalls of satellite data in agricultural, environmental, and resource economics.
- can compute geospatial measures and statistics, such as distances between features, or local averages of variables.
- can transform maps into tables.
- have a working knowledge of how to answer economic questions with geospatial data.

2. Prerequisites

obligatory	none
recommended	Statistics, Econometrics, Impact Evaluation, GIS, R, Foundations of Agricultural, Environmental, and Resource Economics, Google Earth Engine, Python
Maximum number of students	16 students

3. Study program allocation

Study program	**Compulsory/ Elective**	**Semester**
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	**Interval**	**Topic**	**Language of instruction**	**Group size**	**SWS**	**Workload [h]**	
						Contact time	**Self-study**
L	during the semester	Lecture Satellite Data	English	16	1,5	23,0	47,0
T	during the semester	Lecture Satellite Data	English	16	0,5	8,0	12,0
L	during the semester	Lecture Analysis and Modelling	English	16	1,5	23,0	47,0
T	during the semester	Lecture Analysis and Modelling	English	16	0,5	8,0	12,0

5. Course cycle	**6. Workload [h]**	**7. Duration**	**8. Credits (ECTS)**
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [90 min] [780764329]		graded	English	100%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. David Wüpper

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R

Module ID/Code: ENV-270 [780764270]

1. Content and intended learning outcomes

Learning content:	Students will learn how to effectively prepare and visualize data and research results in different ways. Different types of data visualization in particular different kinds of plotting methods will be shown and applied in exercises. Particular emphasis will be given to spatial data and GIS analyses. Students will learn about the basics of GIS and spatial data projections, different spatial data types including raster and vector data, how to import and visualize them and how to combine them in spatial analyses. They will specifically learn how to work with spatial data in R and how to use this free and open source tool to visualize their results in publication ready maps. Students will apply the methods to visualize data of their own choice and present their results during the course.

Learning outcomes

After a successful completion of the course, the students…
- understand the peculiarities of different data formats and how to work with them.
- understand the basics of GIS.
- are able to work with different data in R.
- are able to visualize different data in R.
- conduct spatial analyses with data of different formats.
- are able to apply the packages and methods learned to their own case studies.
- are able to conduct their own analyses and to visualize publication-ready maps.

2. Prerequisites

obligatory	
recommended	Experience with R (programming) is recommended
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Data Wrangling, Visualization and GIS Data Analysis with R	English	25	2,0	30,0	60,0
T	during the semester	Solving Exercises Together	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report [780764279]		graded	English	50%
Presentation [780764278]	Submission of all reports	graded	English	50%

Academic Achievements

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R
Module ID/Code: ENV-270 [780764270]
10. Module coordination
Module coordinator
Jun.-Prof. Dr. Lisa Biber-Freudenberger
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Research Seminar in Agribusiness

Module ID/Code: ABS-330 [780762330]

1. Content and intended learning outcomes

Learning content:	Literature reviews, preparation of a research concept and a thesis proposal; scientific presentations and discussions of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- can describe the problem background of a chosen topic after conducting a literature review.
- can infer a research question or a testable hypothesis from a problem statement.
- can assess, select and compare state-of-the-art research articles in the relevant field.
- have determined an approproate methodology relevant for the research question(s).
- have developed the concept of their Master thesis, including work plan and expected outcomes.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	ABS-120 Methods in Management Research
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for ABS	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	30	2,0	60,0	20,0
S*	during the semester	Own research, writing a term paper	English	30	0,0	0,0	100,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report (presentation) [780762339]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Dr. Daniel Hermann

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Writing guidelines and info leaflet about the Master thesis process can be found under: https://www.afeco.uni-bonn.de/while-studying

Major or Minor Agricultural and Development Policy (APO)

Requirements for the Major Specification:
- Modules accounting for a minimum of 30 ECTS-CP in the Major Specification
- The Research Seminar is in the Major Specification
- The Master Thesis is in the Major Specification

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: European and International Agricultural Policy

Module ID/Code: APO-110 [780763110]

1. Content and intended learning outcomes

Learning content:	1) Theoretical Background for evaluating agricultural policies, reference to e.g. (new) welfare economics, cost-benefit analysis, public choice 2) Economic analysis of agricultural policies of important global players (e.g. EU, US, China), developing, transition countries 3) Current topics and future challenges in international agricultural policy (e.g. rural development, sustainable intensification)

Learning outcomes

After a successful completion of the course, the students…
- will be able to recall the agricultural policy portfolios of important global players.
- will be able to critically discuss the outcomes of different existing studies in view of assumptions made.
- will be able to apply economic theory in analysing exemplary agricultural policies.
- will be able to select and apply relevant economic theories to real-world policy issues.

2. Prerequisites

obligatory	
recommended	Module BAS-130 "Microeconomics"
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1./3.
M.Ed. Agricultural Science (Teacher's Training)	E	1./3.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	European and International Agricultural Policy	English	120	3,0	45,0	40,0
T	during the semester	European and International Agricultural Policy	English	30	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763119]		graded	English	50%
Oral exam [15 min] [780763118]		graded	English	50%

Academic Achievements

Module Title: European and International Agricultural Policy
Module ID/Code: APO-110 [780763110]
10. Module coordination
Module coordinator
Dr. Arnim Kuhn
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Applied Trade Theory and Policy

Module ID/Code: APO-120 [780763120]

1. Content and intended learning outcomes

Learning content:	Why do we observe trade? Technological differences (Ricardian model), differences in factor endowments (Heckscher-Ohlin Model), increasing returns to scale Who gains and who loses from trade? Gains from trade: the country perspective, gains from trade: the "within country" or agent perspective, deviations from the perfect market assumption What are the trade and welfare impacts of specific policies? Import tariffs, import quotas, export subsidies, non-tariff measures What are the gains of trade agreements? Multilateral trade agreements (WTO), regional trade agreements, regional versus multilateral agreements How do multinational firms affect trade?

Learning outcomes

After a successful completion of the course, the students…
- are able to explain the principles of classical and new economic theories of international trade determining trade patterns between countries.
- are able to identify the limitations of the theories and apply them to predefined research problems in the field of agricultural and food trade.
- are able to assess the trade and welfare impacts of trade policies independently in the context of exercises.
- are able to assess contributions and limitations of academic literature on trade issue's.
- have learned to apply spreadsheets and formal analytics to solve economic trade problems.

2. Prerequisites

obligatory	
recommended	Module BAS-130|ARTS-AE6 or similar knowledge in microeconomics at master level
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Applied Trade Theory and Policy	English	120	3,0	45,0	40,0
T	during the semester	Solving theoretical and practical problems	English	20	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763129]		graded	English	

Academic Achievements

Module Title: Applied Trade Theory and Policy
Module ID/Code: APO-120 [780763120]
10. Module coordination
Module coordinator
Prof. Dr. Thomas Heckelei
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Applied Modelling of Agricultural Systems

Module ID/Code: APO-220 [780763220]

1. Content and intended learning outcomes

Learning content:

In this course, the students jointly develop an or improve an existing partial or general equilibrium model and apply it to a topic chosen by them:

- Decision on the topic to analyze - the supervisor will propose topics based on contact to institutions such as OECD, FAO or the EU Commission
- Decision on the appropriate type of simulation model (partial or general equilibrium, details on model structure) to apply
- Acquisition of the necessary data and parameters
- Coding of the model respectively the changes to an exisiting model
- Mapping of the policy question into an appropriate shock definition of the equilibrium model
- Performing and analyzing counterfactual runs
- Documentation of the model (online, report)
- Preparation of a presentation (ca. 30-45 minutes) and a report (ca. 50 page) for the client

Students will present and disucss their findings after the end of the term in a video-conference or a meeting with the client with whom they will also share their report. The students organize the work themselves (milestones and their timining, labour division in groups). The supervisor will monitor and support the process when needed, especially with regard to technical and methodological questions.

Learning outcomes

After a successful completion of the course, the students…
- will have successfully applied a policy relevant equilibrium model.
- will have analyzed a real-world policy question based on quantitative tools.
- will have evaluated the impact of changes in policies on quantities, prices and welfare based on the application on the chosen and expanded equilibrium model.
- will synthetize these impacts in a presentation for the client and jointly document and comment them in a larger report.

2. Prerequisites

obligatory	
recommended	A course on partial and general equilibrium model such as "Partial and General Equilibrium Modelling" APO-250 (offered in 2. term of AFECO program)
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj	during the semester		English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

Module Title: Applied Modelling of Agricultural Systems				
Module ID/Code: APO-220 [780763220]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Report (presentation) [780763229]		graded	English	50%
Report [780763228]		graded	English	50%
Academic Achievements				
10. Module coordination				
Module coordinator				
PD Dr. Wolfgang Britz				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
Not offered in WS 22/23 Presentation for client will be schuled after end of term, Report has to be handed in 8 weeks after end of term Students will receive a course license for GAMS. Examples of past clients and themes: FAO (Rome): analysis of climate change impacts on agri-food markets in developing countries; OECD (Paris): analysis of the impact of the US/China trade ware on selected agri-food markets; GIZ (Bonn): analysis of policy options to foster the self-sufficiency in Western African rice markets; World Bank (Washington D.C.): Analysis of climate change impacts on households in selected developing countries in the context of the Socio-Economic Pathway 2				

Module Title: Advanced Applied Econometrics

Module ID/Code: APO-230 [780763230]

1. Content and intended learning outcomes

Learning content:	- Review of the General Linear Model, OLS and GLS practicing matrix algebra - Model specification (functional form and variable choice) - Endogenous regressors (instrumental variable estimation, Generalised Method of Moments, identification strategies) - Panel data analysis - Maximum Likelihood Estimation - Limited dependent variable models

Learning outcomes

After a successful completion of the course, the students…
- are able to correctly interpret excerpts from econometric textbooks and articles.
- are able to apply matrix algebra in the context of statistics.
- are capable of applying econometric methods to estimate quantitative economic models derived from economic theory.
- select appropriate econometric methods based on the analysis of the data situation and research question.
- correctly use and interpret outputs from econometric software packages.

2. Prerequisites

obligatory	Passed exam in module BAS-110
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Advanced Applied Econometrics	English	120	3,0	45,0	40,0
T		Advanced Applied Econometrics	English	20	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763239]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

11. Further information

Module Title: Development Economics

Module ID/Code: APO-240 [780763240]

1. Content and intended learning outcomes

Learning content:	Empirical patterns in economic development, economic growth models, causes of differential economic growth and development across countries, including the role of institutions, labor markets and migration. Sustainable management of natural resources for development and poverty reduction: key theoretical concepts, critical discussion of empirical policy problems, specifically, regarding water and land management, energy access and transition, the impact of high resource endowments on development, opportunities and challenges posed by climate change in developing countries.

Learning outcomes

After a successful completion of the course, the students…
- are able to describe key concepts and structure of economic growth models and drivers of socio-economic development.
- can explain the role of institutions, labor markets, migration and sustainable natural resource management for economic development.
- are able to apply learned concepts for analysis of development polices.
- can contrast methods for conducting research on sustainable natural resource management topics.
- will appraise empirical examples through case studies.
- are able to generalize lessons learnt from case studies to broader development issues.

2. Prerequisites

obligatory	
recommended	Modules "Advanced Applied Econometrics", "Research Seminar on agricultural and development policy" and "Economics of Sustainability"
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Development Economics	English	25	2,0	30,0	60,0
T	during the semester	Assignement	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763249]		graded	English	

Academic Achievements

Module Title: Development Economics
Module ID/Code: APO-240 [780763240]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Partial and General Equilibrium Modelling

Module ID/Code: APO-250 [780763250]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are simulation models acting at market scale?
2. Introduction to GAMS
- Language structure
- A single market model in GAMS
3. Multi-Commodity models (MCMs)
- A simple multi-market model in GAMS
- Introducing policy instruments in a MCM
- Armington approach and spatial arbitrage
- Presentation of three MCMs: the Policy Evaluation Model of the OECD, the AgriSpace model for Norway and CAPRI
4. Computable General Equilibrium models
- The structure of a Social Accounting Matrix
- Typical structure of a CGE (production function, final demand, trade representation)
- SAM calibration and calibrating a CGE against the SAM
- Trade in CGEs (Armington, CET, Melitz model)
- Scenario analysis with CGEBox

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of partial and general equilibrium models and describe the interactions inside and between these building blocks as expressed in their equations.
- will be able to change equilibrium models in the software package GAMS and conduct counterfactual analysis.
- will be able to analyze the outcome of such models against the background of micro-economic theory and their knowledge of agri-food markets and more general of the economic system.
- will be able to evaluate the impact of changes in policies on quantities, prices and welfare based on the application of equilibrium models.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS 130. That course is obligatory in the AFECO program. A course on Global Food Markets and Systems (BAS 140) is helpful.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763259]		graded	English	

Academic Achievements

Module Title: Partial and General Equilibrium Modelling
Module ID/Code: APO-250 [780763250]
10. Module coordination
Module coordinator
PD Dr. Wolfgang Britz
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.

Module Title: Food security and sustainable food systems

Module ID/Code: APO-260 [780763260]

1. Content and intended learning outcomes

Learning content:	Students will learn to look at agriculture and nutrition through a food systems lens and understand synergies and tradeoffs between human health and planetary health goals. Concepts and measurement of food security, dietary quality, and the triple burden of malnutrition, as well as related policy interventions, will be discussed. Links between agriculture, biodiversity, climate change, diets, nutrition, and health will be analyzed from a global perspective and with empirical examples from low-, middle-, and high-income countries. Case studies will be used to evaluate specific food systems topics from a comprehensive sustainable development perspective. Case studies will include topics such as organic farming, GMOs, meat consumption, palm oil, nutrition-sensitive agriculture, and the supermarket revolution, among others.

Learning outcomes

After a successful completion of the course, the students…
- are able to define key terms related to food security and sustainable diets.
- can explain how food systems relate to the various sustainable development goals (SDGs).
- can identify policy needs and analyze the sustainability implications of specific interventions.
- can evaluate the arguments in the public debate around sustainable agriculture and nutrition.
- can construct and use dietary surveys and nutrition assessment tools.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	3.
M.Sc. Nutrition Science	E	3.
M.Sc. Molecular Food Technology	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	120	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763269]		graded	English	

Academic Achievements

Module Title: Food security and sustainable food systems
Module ID/Code: APO-260 [780763260]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Seminar Policy Analysis

Module ID/Code: APO-300 [780763300]

1. Content and intended learning outcomes

Learning content:	Topical issues on agricultural policy at European and international level will be analysed in presentations and written term papers.

Learning outcomes

After a successful completion of the course, the students…
- can identify and apply the relevant theories and methods in the field of economic policy analysis to policy issues related to the agricultural and food sector.
- are able to correctly apply research techniques such as structuring research papers, literature search, referencing and technical writing.
- are able to present research results using appropriate techniques and can efficiently moderate a scientific discussion.
- are able to develop and judge research designs in order to answer specific research questions with the appropriate qualitative or quantitative methods.
- are able to discuss research results and relate it to state-of-the-art academic literature and to derive policy implications.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S	during the semester	Policy Analysis	English	15	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763309]		graded	English	67%
Presentation [780763308]		graded	English	33%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Special Project in Agricultural and Development Policy

Module ID/Code: APO-310 [780763310]

1. Content and intended learning outcomes

Learning content:	Research topics from the field of Agricultural and Development Policy. Specific topic and form of deliverable (paper, report, poster, documentation....) to be agreed upon between student and coordinator.

Learning outcomes

After a successful completion of the course, the students…
- are able to explain a selected policy issue correctly and with depth.
- have selected and applied theories and appropriate qualitative or quantitative tools of analysis to answer a specific policy related reseach question.
- have evaluated alternative options to analyse policies or evaluated alternative policies with respect to economic impacts.
- have synthesized academic literature and their own research work to contribute to a current policy debate and to identify still existing research gaps.

2. Prerequisites

obligatory	Two out of the modules APO-110, APO-220, APO-230, APO-240, APO-250 have to be completed with simple average at or below 1.3 at the start of this module
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
PS	during the semester	Special project	English	3	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Project work [780763319]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Probabilistic Programming for Applied Agricultural Economics

Module ID/Code: APO-320 [780763320]

1. Content and intended learning outcomes

Learning content:	Students learn to apply Probabilistic Programming to answer quantitative causal research questions. Probabilistic Programming is a novel data science tool combining Bayesian Statistical Modelling, elements of Machine Learning, and standard econometrics. The course contributes to the master's degree by deepening student's quantitative skills and extending their methodical toolkit. Students will learn a basic workflow to perform theory-guided, applied statistical analysis of questions relevant to policy and business. The workflow is intensively practiced with guided coding examples and exercises (in Python and the NumPyro framework). Along the way, the course covers the basics of Bayesian modeling and how to interpret Bayesian modeling results. The course contributes to student's skills relevant to data analytic jobs in research or the private sector.

Learning outcomes

After a successful completion of the course, the students…
- are able to interpret Bayesian modeling results.
- are able to compute statistics of interest from Bayesian model results.
- are able to apply Probabilistic Programming for their own empirical application (e.g. the Master Thesis or following data science projects).
- are able to explain and evaluate the benefits of (Bayesian) Probabilistic Programming approaches compared to other commonly applied econometric approaches.
- have obtained (python) coding experience and data science skills beneficial for the future academic or private sector job market.

2. Prerequisites

obligatory	none
recommended	One of either APO-230 or ENV-130
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theory	English	20	2,0	30,0	60,0
pT	during the semester	Application	English	20	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763329]		graded	English	

Academic Achievements

Module Title: Probabilistic Programming for Applied Agricultural Economics
Module ID/Code: APO-320 [780763320]
10. Module coordination
Module coordinator
Dr. Hugo Storm
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Guided coding examples and exercises will be provided in Python, but no previous Python experience is required. It is sufficient that students have gained some previous experience in coding in general, for example by completing either APO-230 or ENV-130 (both using R) successfully. Nevertheless, a strong interest and motivation to learn Python basics is expected. Background Links: - Ghahramani, Zoubin. 2015. “Probabilistic Machine Learning and Artificial Intelligence.” Nature 521 (7553): 452–59. - McElreath, Richard. 2020. Statistical Rethinking: A Bayesian Course with Examples in R and Stan. Chapman and Hall/CRC. - Thomas Heckelei, Hugo Storm, Kathy Baylis. 2023. Probabilistic Programming for Embedding Theory and Quantifying Uncertainty in Econometric Analysis. Keynote, XVII EAAE Congress 2023 Rennes. https://github.com/hstorm/pp_eaae_rennes - NumPyro Documentation: https://num.pyro.ai/en/stable/

Module Title: Satellite Data in Agricultural Economics

Module ID/Code: ENV-320 [780764320]

1. Content and intended learning outcomes

Learning content:	Introduction and Overview, a primer on satellite data, opportunities arising from satellite data, what can be measured with satellite data, pitfalls, impact evaluations using satellite data, final discussion and conclusion.

Learning outcomes

After a successful completion of the course, the students…
- are able to work with data in Google Earth Engine and in R.
- understand potentials and pitfalls of satellite data in agricultural, environmental, and resource economics.
- can compute geospatial measures and statistics, such as distances between features, or local averages of variables.
- can transform maps into tables.
- have a working knowledge of how to answer economic questions with geospatial data.

2. Prerequisites

obligatory	none
recommended	Statistics, Econometrics, Impact Evaluation, GIS, R, Foundations of Agricultural, Environmental, and Resource Economics, Google Earth Engine, Python
Maximum number of students	16 students

3. Study program allocation

Study program	**Compulsory/ Elective**	**Semester**
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	**Interval**	**Topic**	**Language of instruction**	**Group size**	**SWS**	**Workload [h]**	
						Contact time	**Self-study**
L	during the semester	Lecture Satellite Data	English	16	1,5	23,0	47,0
T	during the semester	Lecture Satellite Data	English	16	0,5	8,0	12,0
L	during the semester	Lecture Analysis and Modelling	English	16	1,5	23,0	47,0
T	during the semester	Lecture Analysis and Modelling	English	16	0,5	8,0	12,0

5. Course cycle	**6. Workload [h]**	**7. Duration**	**8. Credits (ECTS)**
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [90 min] [780764329]		graded	English	100%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. David Wüpper

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Research Seminar in Agricultural and Development Policy

Module ID/Code: APO-330 [780763330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal, presentations of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- can describe the problem background of a chosen topic after conducting a literature review.
- can infer a research question or a testable hypothesis from a problem statement.
- can assess, select and compare state-of-the-art research articles in the relevant field.
- have determined an appropriate methodology relevant for the research question(s) after evaluation of alternative approaches.
- have developed the concept of their Master thesis, including work plan and expected outcomes.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for APO	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	15	2,0	30,0	30,0
S*	during the semester	Own research, writing term paper	English	15	0,0	0,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763339]	Regular participation to learn from others	graded	English	67%
Presentation [780763338]	Regular participation to learn from others	graded	English	33%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Major or Minor Resource and Environmental Economics (ENV)

Requirements for the Major Specification:
- Modules accounting for a minimum of 30 ECTS-CP in the Major Specification
- The Research Seminar is in the Major Specification
- The Master Thesis is in the Major Specification

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: Economics on Sustainability

Module ID/Code: ENV-100 [780764100]

1. Content and intended learning outcomes

Learning content:	Basic approaches of ecological and environmental economics; intertemporal allocation of renewable and non-renewable resources; Hartwick-rule; definition and indicators for sustainability (genuine savings); environmental Kuznets curve and pollution haven hypothesis; life-cycle-analysis and rebound-effects, food consumption and sustainability, monetary valuation of environmental impacts;

Learning outcomes

After a successful completion of the course, the students…
- can define basic concepts of sustainability and ecological and environmental economics.
- are able to translate welfare functions into preferences and vice versa.
- can interpret economic models and their assumptions.
- are able to apply economic theory to problems of environmental economics (e. g. renewable resources).
- can evaluate the pros and cons of different policies.
- are able to apply economic theory to real world problems.
- can systematically organize their arguments in the form of essays.
- are able to extract the gist of scientific articles.
- can discuss scientific articles.

2. Prerequisites

obligatory	
recommended	solid knowledge of microeconomics, institutional economics and welfare theory
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	economics on sustainability	English	20	2,0	30,0	40,0
T	during the semester	economics on sustainability	English	20	2,0	30,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [120 min] [780764109]		graded	English	

Academic Achievements

Module Title: Economics on Sustainability
Module ID/Code: ENV-100 [780764100]
10. Module coordination
Module coordinator
Prof. Dr. Jan Börner
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Environmental Economics and Policies

Module ID/Code: ENV-110 [780764110]

1. Content and intended learning outcomes

Learning content:	General environmental policy: Public goods, Common pool resources and institutions, Theoretically optimal policy instruments (Coase, Pigou); pragmatic policy instruments (with real world examples): environmental liability, command and control approaches, taxes, subsidies, emission trading; Asymetric information and incentive compatible instruments; eco-tax and double dividend; Agricultural environmental policy: Property rights, taxes and agri-environmental measures (AEM), performance based AEM, auctions in AEM; influences from other sectors on agri-environmental policy implications.

Learning outcomes

After a successful completion of the course, the students…
- can use neoclassical and institutional economics to analyze environmental policy.
- can discuss complex matters grounded in economic theory.
- identify implicit assumptions of certain economic approaches.
- systematically organize their argumentation.
- apply the concepts learned to new policy fields.
- compare different research approaches to empirical questions.

2. Prerequisites

obligatory	
recommended	solid knowledge of microeconomics and institutional economics as well as welfare economics
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	enironmental economics and policies	English	20	2,0	30,0	40,0
T	during the semester	environmental economics and policies	English	20	2,0	30,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [120 min] [780764119]		graded	English	

Academic Achievements

Module Title: Environmental Economics and Policies
Module ID/Code: ENV-110 [780764110]
10. Module coordination
Module coordinator
Prof. Dr. Jan Börner
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
11. Further information

Module Title: Impact evaluation of conservation & development projects and environmental policies

Module ID/Code: ENV-130 [780764130]

1. Content and intended learning outcomes

Learning content:	- Role of impact evaluation in guiding the design of development and environmental conservation initiatives - Understanding and developing a theory of change - Overview, hands-on application, and critical assessment of quantitative evaluation methods including experimental and quasi-experimental research designs - Evaluation case studies; advanced topics, such as impact heterogeneity and mediation analysis.

Learning outcomes

After a successful completion of the course, the students…
- know alternative quantitative evaluation methods and their underlying assumptions.
- understand how different types of biases affect evaluations of development and conservation initiatives.
- apply selected evaluation methods to real world problems.
- critically interpret findings from evaluation studies.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Impact Evaluation	English	25	2,0	30,0	60,0
T	during the semester	Exercise	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780764139]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
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Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Complex systems modeling of human-environment interactions

Module ID/Code: ENV-140 [780764140]

1. Content and intended learning outcomes

Learning content:

1. Introduction
   - Human-environment (H-E) interactions in social-ecologial systems
   - Complex systems, Critical transitions and Resilience
   - Modeling as a way to make sense of the world
   - Basic introduction to python as a common-purpose programming language
2. Game theory: Modeling strategic interactions
   - Cooperation as collective action to maintain the commons
3. Dynamical systems: Modeling change and stability
   - Interacting cause and effect relationships
   - Ball-and-cup resilience
4. Agent-based modelling: Modeling collective behavior from interacting agents
   - Diverse, boundedly rational agents under inequality
5. Synthesis: Modeling intelligent agents as dynamical systems

Learning outcomes

After a successful completion of the course, the students…
- can state different modeling approaches to human-environment interactions and describe their underlying assumptions.
- can contrast the characteristics of different modeling approaches to H-E interactions and explain their comparative advantages.
- can write simple models or alter more difficult models of H-E interactions in python.
- can analyze such models of H-E interactions regarding phenomena in complex systems.
- are able to critque model results on the basis of a model's assumptions.
- can explain models efficiently, synthesise model results and summarize both in written and oral form.

2. Prerequisites

obligatory	
recommended	basic knowledge in microeconomics (game theory), dynamical systems, and in a general-purpose programming language is an advantage
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Complex H-E models	English	20	2,0	42,0	93,0
T	during the semester	Implementing and analyzing H-E models	English	20	2,0	14,0	31,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report [780764149]		graded	English	50%
Presentation [780764148]		graded	English	50%

Academic Achievements

Module Title: Complex systems modeling of human-environment interactions
Module ID/Code: ENV-140 [780764140]
10. Module coordination
Module coordinator
Jun. Prof. Dr. Wolfram Barfuss
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Advanced Environmental Economics

Module ID/Code: ENV-210 [780764210]

1. Content and intended learning outcomes

Learning content:	Critical interpretation and discussion of theoretical models and applications in environmental and resource economics. Examples from forest and biodiversity conservation, pollution and waste, non-renewable resources, trans-boundary resource use, and international environmental agreements.

Learning outcomes

After a successful completion of the course, the students…
- know alternative theoretical approaches in environmental and resource economics.
- understand the implications of assumptions in formal economic models for real world applications.
- apply theory and numerical techniques to solve common problems in environmental and resource economics.

2. Prerequisites

obligatory	
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Advanced Environmental Economics	English	25	2,0	30,0	0,0
T	during the semester	Assignment	English	25	2,0	30,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Oral exam [20 min] [780764219]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
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Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Bio-Economic Modelling At Farm-Scale

Module ID/Code: ENV-240 [780764240]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are farm-scale simulation models?
2. Introduction to Linear Programming
2.1 Assumptions of Linear Programming
2.2 Primal and dual solution
3. Introduction to GAMS
3.1 Language structure
3.2 A first simple GAMS model of a farm
4. Modelling core bio-economic interactions at farm scale
4.1 Herd dynamics, requirements and cost minimal feed mix
4.2 Crops, rotations, cropping intensity
4.3 Labour use
4.4 Combing the elements, integrating environment indicators
5. Modeling Investments and Financing Decisions
5.1 Maximizing Net Present Value
5.2 Accounting for depreciation
5.3 Indivisibilities in investments
5.4 Full financial plan and income tax
6. Modeling Risk and risk behavior
6.1 State of nature, decision under uncertainty, MOTAD and Target MOTAD
6.2 State contingent decision variables
6.3 Dynamic stochastic programming

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of farm-scale bio-economic models and describe the interactions inside and between various sub-systems inside a farm as expressed in a formal optimization model.
- will be able to write simple or change more complex farm-scale bio-economic models in the software package GAMS.
- will be able to analyze the outcome of such a model against the background of micro-economic theory.
- will be able to evaluate the impact of drivers of farm management decisions such as changes in input/output prices or farm-scale policies on economic and environmental indicators based on the application of a bio-economic model.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS-130 and a course on risk management such as BAS-150. Both courses are obligatory in the AFECO program.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

Module Title: Bio-Economic Modelling At Farm-Scale				
Module ID/Code: ENV-240 [780764240]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Term paper [780764249]		graded	English	
Academic Achievements				
10. Module coordination				
Module coordinator				
PD Dr. Wolfgang Britz				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.				

Module Title: Seminar on Environmental Economics and Policy

Module ID/Code: ENV-300 [780764300]

1. Content and intended learning outcomes

Learning content:	Topical and policy relevant issues in environmental and ecological economics. Examples: Policies for tropical forest conservation, sustainable green and bioeconomy, international trade and the environment.

Learning outcomes

After a successful completion of the course, the students…
- obtain deep knowledge of selected environmental policy issues.
- are able to interpret advanced concepts in environmental policy analysis.
- can apply environmental and ecological economic concepts to topical policy debates.
- are able to analyze quantitative and qualitative data using empirical methods from environmental economics.
- can synthesize complex debates on environmental policy design.

2. Prerequisites

obligatory	
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	15 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S* (blocked)	full-day block	Seminar, Friday block in November	English	15	4,0	60,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780764309]	Regular participation	graded	English	50%
Presentation [780764308]	Regular participation	graded	English	30%
Project work [780764307]	Regular participation	graded	English	20%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Special Project in Environmental Economics

Module ID/Code: ENV-310 [780764310]

1. Content and intended learning outcomes

Learning content:	Topic from the field of Environmental, Ecological or Resource Economics. Specific topic and form of deliverable (term paper, report, poster, documentation,...) to be agreed upon between student and coordinator.

Learning outcomes

After a successful completion of the course, the students…
- obtain deep knowledge of selected environmental policy issues.
- are able to interpret advanced environmental and ecological economic concepts.
- can apply environmental and ecological economic concepts to topical policy debates.
- can apply advanced skills in literature and data analysis.
- are able to synthesize complex debates on environmental policy design.

2. Prerequisites

obligatory	ENV-100 and ENV-110 and ENV-130 have to be completed at or below 1.7 at the start of this module
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	3 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
PS	during the semester	Special project	English	3	2,0	20,0	160,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Project work [780764319]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
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Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Sustainability and Risk	
Module ID/Code: ENV-260 [780764260]	
1. Content and intended learning outcomes	
Learning content:	Knowledge about sustainability, risk(s) and transformation is key to understanding the societal challenges of global change and to considering them in one's own field of action. In this course we take an interdisciplinary approach to teaching these concepts integrating knowledge from social and natural theory and science. Starting from the current state of global sustainability problems and transformation perspectives as well as associated political processes, this interdisciplinary and multi-perspective course first illustrates the fundamentals of the terms 'sustainability', 'risk' and ' transformation' as well as other related concepts and terms. Building on this theoretical unterpinning, particular attention is paid to the 2030 Agenda for Sustainable Development by critically discussing aspects such as implementation and measurement of the Sustainable Development Goals (SDGs) including the basics and critical aspects of economic growth. Furthermore, we explore how farmers, consumers and insurances take decisions in the face of increasing risks associated with global change as well as transformation. This is done by providing insights into the field of sustainable consumption, such as on types, motives and barriers of sustainable production and consumption, as well as on measures to promote sustainable consumer behaviour. We furthermore explore how natural ecosystems manage risks and if and how these principles could be also applied in an agricultural context e.g. in the context of pest management. Furthermore, we introduce complex systems thinking as a tool to deal with risks. The examples used during the course often refer to agriculture and the food industry, but are intentionally not limited to them. Besides the continuous use of built-in short exercises, interactive teaching formats (e.g. live quizzes, case studies, simulation game), students will be engaged in lively discussions on the topics and encouraged to bring in own perspectives. As a basis for the grading, students will engage in group work to develop and implement either a board game or a small self-experiment (will be decided each year) incorporating aspects of risks, sustainability or transformation. The results of this group work will be presented during a public game or poster presentation.
Learning outcomes	
After a successful completion of the course, the students… - know about the different scientific and political debates as well as their development in the context of sustainability, risks and transformation. - have developed a general and interdisciplinary understanding of complex challenges and concepts related to sustainability, risks and transformation. - understand the practical challenges and chances related to these concepts for agriculture in different contexts (different countries, different farm sizes etc.). - are able to apply these concepts in the context of research questions related to agriculture and land use.	
2. Prerequisites	
obligatory	
recommended	
Maximum number of students	50 students

Module Title: Sustainability and Risk

Module ID/Code: ENV-260 [780764260]

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	C	3.
M.Sc. Crop Sciences	E Focus PERC	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	80	4,0	45,0	135,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Presentation [780764269]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Jun.-Prof. Dr. Lisa Biber-Freudenberger

Teaching person

The teaching persons in the current semester can be found in basis:
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Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

External guests e.g. farmers to talk about their perspectives on sustainability, risks and transformation

Module Title: Advanced Applied Econometrics

Module ID/Code: APO-230 [780763230]

1. Content and intended learning outcomes

Learning content:	- Review of the General Linear Model, OLS and GLS practicing matrix algebra - Model specification (functional form and variable choice) - Endogenous regressors (instrumental variable estimation, Generalised Method of Moments, identification strategies) - Panel data analysis - Maximum Likelihood Estimation - Limited dependent variable models

Learning outcomes

After a successful completion of the course, the students…
- are able to correctly interpret excerpts from econometric textbooks and articles.
- are able to apply matrix algebra in the context of statistics.
- are capable of applying econometric methods to estimate quantitative economic models derived from economic theory.
- select appropriate econometric methods based on the analysis of the data situation and research question.
- correctly use and interpret outputs from econometric software packages.

2. Prerequisites

obligatory	Passed exam in module BAS-110
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Advanced Applied Econometrics	English	120	3,0	45,0	40,0
T		Advanced Applied Econometrics	English	20	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763239]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

11. Further information

Module Title: Agricultural Production Economics

Module ID/Code: ABS-210 [780762210]

1. Content and intended learning outcomes

Learning content:	Fundamentals of agricultural production economics and management; factors influencing the operational outcome and sustainability of farms; theoretical and applied efficiency and productivity analysis; management challenges related to agricultural production; farm production organization.

Learning outcomes

After a successful completion of the course, the students…
- understand the fundamental theories and concepts of agricultural production economics.
- understand and critically reflect on the relevance of theories and concepts for important current issues in agriculture (e.g., transformation to sustainable and resilient production systems).
- integrate interdisciplinary insights (e.g. from agronomy or ecology) into models and theories of production economics.
- critically question the limits of the introduced fundamental theories and concepts and understand approaches that go beyond them.
- apply the theories, concepts and models they have learned theoretically, algebraically and empirically to relevant problems of agricultural production.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theory	English	30	2,0	28,0	42,0
T	during the semester	Application	English	30	2,0	28,0	82,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [90 min] [780762219]		graded	English	

Academic Achievements

Module Title: Agricultural Production Economics
Module ID/Code: ABS-210 [780762210]
10. Module coordination
Module coordinator
Prof. Dr. Niklas Möhring
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Ethics in Food Consumption and Production

Module ID/Code: MAC-230 [780765230]

1. Content and intended learning outcomes

Learning content:	- Introduction to ethics: ethical theories, ethical arguments - Application of ethical reasoning to food topics (e. g., global hunger, food biotechnology, livestock welfare/animal rights). - Ethics and consumer choice: determinants of (non-)ethical consumption (behavioural consumer models); influencing consumer choice (e.g. food labelling policies; nudges). - Ethics and businesses (in the food sector): Role of businesses in society, Corporate Social Responsibility (CSR) related concepts, effects of CSR (empirical evidence), CSR communication. - Case studies regarding ethical consumerism and CSR in the food sector.

Learning outcomes

After a successful completion of the course, the students…
- are able to describe ethical theories and theories and concepts related to responsible firm conduct.
- can explain ethical arguments and different views regarding the role of businesses in society.
- summarise relevant empirical studies investigating responsible/ ethical behaviour.
- can apply relevant theories and concepts to ethical issues in the food sector.
- can critically assess ethical cases with relevance to the food sector.
- are able to conduct their own evaluation of a specific case linked to the food sector.
- are able to discuss and reflect on own findings and on research of others.
- have developed skills in producing a scientific presentation.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Ethics in Food Consumption and Production	English	20	2,4	36,0	50,0
T	during the semester	Discussion of ethical issues related to (food) consumption and production	English	20	0,8	12,0	20,0
PS	during the semester	Case studies regarding ethics in the food sector.	English	20	0,8	12,0	50,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

Module Title: Ethics in Food Consumption and Production				
Module ID/Code: MAC-230 [780765230]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Project work [780765239]		graded	English	60%
Assignment [780765238]		graded	English	40%
Academic Achievements				
10. Module coordination				
Module coordinator				
Prof. Dr. Monika Hartmann				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				

Module Title: Partial and General Equilibrium Modelling

Module ID/Code: APO-250 [780763250]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are simulation models acting at market scale?
2. Introduction to GAMS
- Language structure
- A single market model in GAMS
3. Multi-Commodity models (MCMs)
- A simple multi-market model in GAMS
- Introducing policy instruments in a MCM
- Armington approach and spatial arbitrage
- Presentation of three MCMs: the Policy Evaluation Model of the OECD, the AgriSpace model for Norway and CAPRI
4. Computable General Equilibrium models
- The structure of a Social Accounting Matrix
- Typical structure of a CGE (production function, final demand, trade representation)
- SAM calibration and calibrating a CGE against the SAM
- Trade in CGEs (Armington, CET, Melitz model)
- Scenario analysis with CGEBox

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of partial and general equilibrium models and describe the interactions inside and between these building blocks as expressed in their equations.
- will be able to change equilibrium models in the software package GAMS and conduct counterfactual analysis.
- will be able to analyze the outcome of such models against the background of micro-economic theory and their knowledge of agri-food markets and more general of the economic system.
- will be able to evaluate the impact of changes in policies on quantities, prices and welfare based on the application of equilibrium models.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS 130. That course is obligatory in the AFECO program. A course on Global Food Markets and Systems (BAS 140) is helpful.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763259]		graded	English	

Academic Achievements

Module Title: Partial and General Equilibrium Modelling
Module ID/Code: APO-250 [780763250]
10. Module coordination
Module coordinator
PD Dr. Wolfgang Britz
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.

Module Title: Food security and sustainable food systems

Module ID/Code: APO-260 [780763260]

1. Content and intended learning outcomes

Learning content:	Students will learn to look at agriculture and nutrition through a food systems lens and understand synergies and tradeoffs between human health and planetary health goals. Concepts and measurement of food security, dietary quality, and the triple burden of malnutrition, as well as related policy interventions, will be discussed. Links between agriculture, biodiversity, climate change, diets, nutrition, and health will be analyzed from a global perspective and with empirical examples from low-, middle-, and high-income countries. Case studies will be used to evaluate specific food systems topics from a comprehensive sustainable development perspective. Case studies will include topics such as organic farming, GMOs, meat consumption, palm oil, nutrition-sensitive agriculture, and the supermarket revolution, among others.

Learning outcomes

After a successful completion of the course, the students…
- are able to define key terms related to food security and sustainable diets.
- can explain how food systems relate to the various sustainable development goals (SDGs).
- can identify policy needs and analyze the sustainability implications of specific interventions.
- can evaluate the arguments in the public debate around sustainable agriculture and nutrition.
- can construct and use dietary surveys and nutrition assessment tools.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	3.
M.Sc. Nutrition Science	E	3.
M.Sc. Molecular Food Technology	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	120	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763269]		graded	English	

Academic Achievements

Module Title: Food security and sustainable food systems
Module ID/Code: APO-260 [780763260]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Probabilistic Programming for Applied Agricultural Economics

Module ID/Code: APO-320 [780763320]

1. Content and intended learning outcomes

Learning content:	Students learn to apply Probabilistic Programming to answer quantitative causal research questions. Probabilistic Programming is a novel data science tool combining Bayesian Statistical Modelling, elements of Machine Learning, and standard econometrics. The course contributes to the master's degree by deepening student's quantitative skills and extending their methodical toolkit. Students will learn a basic workflow to perform theory-guided, applied statistical analysis of questions relevant to policy and business. The workflow is intensively practiced with guided coding examples and exercises (in Python and the NumPyro framework). Along the way, the course covers the basics of Bayesian modeling and how to interpret Bayesian modeling results. The course contributes to student's skills relevant to data analytic jobs in research or the private sector.

Learning outcomes

After a successful completion of the course, the students…
- are able to interpret Bayesian modeling results.
- are able to compute statistics of interest from Bayesian model results.
- are able to apply Probabilistic Programming for their own empirical application (e.g. the Master Thesis or following data science projects).
- are able to explain and evaluate the benefits of (Bayesian) Probabilistic Programming approaches compared to other commonly applied econometric approaches.
- have obtained (python) coding experience and data science skills beneficial for the future academic or private sector job market.

2. Prerequisites

obligatory	none
recommended	One of either APO-230 or ENV-130
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theory	English	20	2,0	30,0	60,0
pT	during the semester	Application	English	20	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763329]		graded	English	

Academic Achievements

Module Title: Probabilistic Programming for Applied Agricultural Economics
Module ID/Code: APO-320 [780763320]
10. Module coordination
Module coordinator
Dr. Hugo Storm
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Guided coding examples and exercises will be provided in Python, but no previous Python experience is required. It is sufficient that students have gained some previous experience in coding in general, for example by completing either APO-230 or ENV-130 (both using R) successfully. Nevertheless, a strong interest and motivation to learn Python basics is expected. Background Links: - Ghahramani, Zoubin. 2015. “Probabilistic Machine Learning and Artificial Intelligence.” Nature 521 (7553): 452–59. - McElreath, Richard. 2020. Statistical Rethinking: A Bayesian Course with Examples in R and Stan. Chapman and Hall/CRC. - Thomas Heckelei, Hugo Storm, Kathy Baylis. 2023. Probabilistic Programming for Embedding Theory and Quantifying Uncertainty in Econometric Analysis. Keynote, XVII EAAE Congress 2023 Rennes. https://github.com/hstorm/pp_eaae_rennes - NumPyro Documentation: https://num.pyro.ai/en/stable/

Module Title: Satellite Data in Agricultural Economics

Module ID/Code: ENV-320 [780764320]

1. Content and intended learning outcomes

Learning content:	Introduction and Overview, a primer on satellite data, opportunities arising from satellite data, what can be measured with satellite data, pitfalls, impact evaluations using satellite data, final discussion and conclusion.

Learning outcomes

After a successful completion of the course, the students…
- are able to work with data in Google Earth Engine and in R.
- understand potentials and pitfalls of satellite data in agricultural, environmental, and resource economics.
- can compute geospatial measures and statistics, such as distances between features, or local averages of variables.
- can transform maps into tables.
- have a working knowledge of how to answer economic questions with geospatial data.

2. Prerequisites

obligatory	none
recommended	Statistics, Econometrics, Impact Evaluation, GIS, R, Foundations of Agricultural, Environmental, and Resource Economics, Google Earth Engine, Python
Maximum number of students	16 students

3. Study program allocation

Study program	**Compulsory/ Elective**	**Semester**
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	**Interval**	**Topic**	**Language of instruction**	**Group size**	**SWS**	**Workload [h]**	
						Contact time	**Self-study**
L	during the semester	Lecture Satellite Data	English	16	1,5	23,0	47,0
T	during the semester	Lecture Satellite Data	English	16	0,5	8,0	12,0
L	during the semester	Lecture Analysis and Modelling	English	16	1,5	23,0	47,0
T	during the semester	Lecture Analysis and Modelling	English	16	0,5	8,0	12,0

5. Course cycle	**6. Workload [h]**	**7. Duration**	**8. Credits (ECTS)**
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [90 min] [780764329]		graded	English	100%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. David Wüpper

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R

Module ID/Code: ENV-270 [780764270]

1. Content and intended learning outcomes

Learning content:	Students will learn how to effectively prepare and visualize data and research results in different ways. Different types of data visualization in particular different kinds of plotting methods will be shown and applied in exercises. Particular emphasis will be given to spatial data and GIS analyses. Students will learn about the basics of GIS and spatial data projections, different spatial data types including raster and vector data, how to import and visualize them and how to combine them in spatial analyses. They will specifically learn how to work with spatial data in R and how to use this free and open source tool to visualize their results in publication ready maps. Students will apply the methods to visualize data of their own choice and present their results during the course.

Learning outcomes

After a successful completion of the course, the students…
- understand the peculiarities of different data formats and how to work with them.
- understand the basics of GIS.
- are able to work with different data in R.
- are able to visualize different data in R.
- conduct spatial analyses with data of different formats.
- are able to apply the packages and methods learned to their own case studies.
- are able to conduct their own analyses and to visualize publication-ready maps.

2. Prerequisites

obligatory	
recommended	Experience with R (programming) is recommended
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Data Wrangling, Visualization and GIS Data Analysis with R	English	25	2,0	30,0	60,0
T	during the semester	Solving Exercises Together	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report [780764279]		graded	English	50%
Presentation [780764278]	Submission of all reports	graded	English	50%

Academic Achievements

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R
Module ID/Code: ENV-270 [780764270]
10. Module coordination
Module coordinator
Jun.-Prof. Dr. Lisa Biber-Freudenberger
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Research Seminar in Resource and Environmental Economics

Module ID/Code: ENV-330 [780764330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal; presentations of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- synthesize the scientific state of the art in a self-selected field of research.
- construct a conceptual framework in social science / environmental economics.
- develop and present a research proposal.
- engage in scientific debates.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	15 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for ENV	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	15	2,0	30,0	30,0
S*	during the semester	Own research, writing term paper	English	15	0,0	0,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780764339]	Regular participation to learn from others and enable others to learn	graded	English	60%
Presentation [780764338]	Regular participation to learn from others and enable others to learn	graded	English	40%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Major or Minor Market and Consumer Research (MAC)

Requirements for the Major Specification:
- Modules accounting for a minimum of 30 ECTS-CP in the Major Specification
- The Research Seminar is in the Major Specification
- The Master Thesis is in the Major Specification

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: Global Agricultural and Food Markets

Module ID/Code: MAC-130 [780765130]

1. Content and intended learning outcomes

Learning content:	- Supply, demand, trade of major food markets (European/global) - Interdependencies between agricultural and food markets - Legal framework for international markets - Private versus public standards in agricultural and food markets - Relevance and evaluation of Non-Tariff Trade Barriers in agicultural and food markets - Relevant actors on agricultural and food markets - Spatial and enterprise concentration in the agricultural up- and downstream sector - Basics of modelling agricultural markets

Learning outcomes

After a successful completion of the course, the students…
- can describe key European and global agricultural and food markets.
- can explain the impact of interdependencies between agricultural and food markets.
- are able to analyse developments on agricultural and food markets based on economic theories.
- can describe the basic framework for international trade provided by the WTO.
- can explain the relevance, the international framework of NTB in agricultural and food markets.
- are able to evaluate the welfare effects of NTB under different assumptions.
- comprehend the difference between private and public standards in world agricultural and food markets.
- can explain and structure relevant actors of international agricultural and food markets.
- can explain the need for coordination within food value chains depending on product and value chain characteristics.
- can evaluate results of agricultural models.
- are able to combine insights generated in class to a specific case and present/ discuss in class.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Knowledge wrt and tools to analyse Global Food Market and Systems	English	25	2,0	30,0	45,0
S	during the semester	Combine insights generated in class to a specific case	English	25	1,0	15,0	45,0
T	during the semester	Analyse/evaluate intervention and situation in markets	English	25	1,0	15,0	30,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

Module Title: Global Agricultural and Food Markets				
Module ID/Code: MAC-130 [780765130]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [780765139]		graded	English	60%
Presentation [780765138]		graded	English	40%
Academic Achievements				
10. Module coordination				
Module coordinator				
Dr. Johannes Simons				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				

Module Title: Food Marketing

Module ID/Code: MAC-100 [780765100]

1. Content and intended learning outcomes

Learning content:	Marketing Concept: Gain insights into the impact of marketing (attitudes, behaviour change, conditioning, external influences), neuromarketing, the role of the competitive environment (information technology, concentration, sourcing cooperations, competition, buyer power, vertical integration), the marketing fields of action (product, price, distribution and promotion) with specific focus on food enterprises. Marketing management: Apply marketing stragegies (e.g. brand portfolio strategy, segmentation policy) in a competitive environment using an interactive simulation game, analyze and evaluate market information based on research studies for the development of marketing strategies.

Learning outcomes

After a successful completion of the course, the students…
- can describe relevant psychological and sociological constructs to understand the impact of marketing.
- have an overview on competitive conditions in food markets with a focus on German food markets.
- know the marketing fields of action and opportunities to apply instruments in the competitive surrounding of food markets.
- explain the differences in the impact of marketing strategies depending on the market environment (e.g. market structure).
- can analyse consumer reactions based on psychological and sociological constructs.
- are able to analyse developments in food value chains.
- able to develop and implement marketing strategies at firm level in a highly competitive environment.
- are able to analyze and interpret market information based on research studies.
- are able to present, discuss and defend marketing strategies implemented.

2. Prerequisites

obligatory	
recommended	Knowlege about the food sector
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Marketing	English	20	2,0	30,0	50,0
T	during the semester	Marktstrat Simulation Game	English	20	2,0	30,0	70,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780765109]		graded	English	60%
Presentation [780765108]		graded	English	40%

Academic Achievements

Module Title: Food Marketing
Module ID/Code: MAC-100 [780765100]
10. Module coordination
Module coordinator
Jeanette Klink-Lehmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Food Industrial Economics

Module ID/Code: MAC-110 [780765110]

1. Content and intended learning outcomes

Learning content:	The module provides students with an understanding of the impact of industry structure and firms' behavior on economic performance and welfare and for the rationale of government intervention in imperfect competitive markets. It covers topics related to - Structure and characteristics of the European food sector - Competition (competition concepts, competition policy in Europe) - Structure Conduct Performance framework; - Market structure (barriers to entry/exit; monopoly/monospony power, dominant firm, oligopoly) - Business conduct (cooperative and non-cooperative strategies, price discrimination, product differentiation and monopolitistic competition, advertisement, information policy).. - Market performance (level and persistence). - Real-world cases dealing with Structural Economic issues and focusing on agricultural and food markets.

Learning outcomes

After a successful completion of the course, the students…
- are able to describe main characteristics of the European food sector.
- can explain the interdependencies between market structure, conduct and performance.
- can apply concepts used in industrial economics.
- can analyse interactions between firms using game theory.
- can analyse the impact of different market structures and firms' strategies.
- are able to critically evaluate the effects of business strategies on firms' performance and consumer/societal welfare.
- can explain and give examples for the role of economic policy in imperfect competitive markets.
- are able to relate presented theories to real world cases with relevance to the food sector, analyze and evaluate those cases, discuss policy implications.

2. Prerequisites

obligatory	
recommended	BAS-130 or equivalent knowledge
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Food Industrial Economics	English	20	2,5	30,0	50,0
T	during the semester	Exercise: Solving problems in Industrial Economics	English	20	1,0	15,0	20,0
PS	during the semester	Case studies of IE with relevance for the food sector.	English	20	0,5	8,0	57,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

Module Title: Food Industrial Economics				
Module ID/Code: MAC-110 [780765110]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Written exam [780765119]		graded	English	70%
Project work [780765118]		graded	English	30%
Academic Achievements				
10. Module coordination				
Module coordinator				
Prof. Dr. Monika Hartmann				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				

Module Title: Behavioral Economics in Agri-Food markets

Module ID/Code: MAC-120 [780765120]

1. Content and intended learning outcomes

Learning content:	Rational choice in neoclassical economics, bounded rationality, framing, anchoring and endowment effects, status quo bias, heuristics and cognitive errors, nudging, libertarian paternalism, experimental economics, altruism, fairness and reciprocity, introduction to cognitive neuroscience.

Learning outcomes

After a successful completion of the course, the students…
- can outline the concept of rational choice in neoclassical economics and it's shortcomings in explaining real world human behaviour.
- explain key concepts in behavioral economics like bounded rationality, framing, anchoring and endowment effects, status quo bias, heuristics and cognitive errors, nudging, altruism, fairness and reciprocity.
- can describe how experiments are conducted in behavioral economics and construct an experimental setup for a given research question.
- discuss ethics in behavioral economics, focusing in particular on nudging and libertarian paternalism.
- can comprehend, present and discuss experimental scientific papers.
- explain different methods of cognitive neuroscience.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Behavioral Economics	English	20	3,0	45,0	60,0
S	during the semester	Behavioral Economics	English	20	1,0	15,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [60 min] [780765129]		graded	English	70%
Presentation [780765128]		graded	English	30%

Academic Achievements

Module Title: Behavioral Economics in Agri-Food markets
Module ID/Code: MAC-120 [780765120]
10. Module coordination
Module coordinator
Jeanette Klink-Lehmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Advanced Methods of Market and Consumer Research

Module ID/Code: MAC-210 [780765210]

1. Content and intended learning outcomes

Learning content:	The module provides insights into theories and methods concerning the measurement and analysis of consumers' attitudes, perceptions, evaluations, and preferences using non-parametric tests, moderation/mediation analysis, regression models, factor analysis, structural equation modelling, cluster analysis, and (discrete) choice experiments.

Learning outcomes

After a successful completion of the course, the students…
- are able to prepare data for a subsequent statistical analysis.
- are able to perform hypothesis testing using parametric and non-parametric tests.
- are able to perform empirical research applying the method(s) taught in class.
- are able to evaluate the analytic results obtained from the statistical software.
- are able to identify appropriate research methods for a research problem.
- are able to understand respective methods from a theoretical point of view.
- are able to present and reflect results obtained from empirical analysis.

2. Prerequisites

obligatory	
recommended	Module BAS-110
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Theories and methods of empirical research	English	20	2,0	30,0	70,0
T	during the semester	Conduct empirical research	English	20	2,0	30,0	50,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780765219]		graded	English	60%
Project work [780765218]		graded	English	40%

Academic Achievements

Module Title: Advanced Methods of Market and Consumer Research
Module ID/Code: MAC-210 [780765210]
10. Module coordination
Module coordinator
Jeanette Klink-Lehmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Communication in the Food Sector

Module ID/Code: MAC-220 [780765220]

1. Content and intended learning outcomes

Learning content:	- Information Economics - Communication Theory and Communication Models - Media Research (e.g. Uses and Gratification Approach, Agenda-Setting, Knowledge Gap, Cultivation Theory); - Perception and Communication (e.g. Narrative Paradigm, Dissonance Theory, Attitude Change); - Marketing; Advertising and commercials in the food sector; Labelling policies

Learning outcomes

After a successful completion of the course, the students…
- define and describe important conceptualizations of communication research.
- are able to identify and distinguish different models of communication and to give examples.
- are able to explain different approaches and theories related to (mass) media research.
- can identify different marketing and advertising strategies in the food sector and are able to give examples.
- are able to apply conceptual knowledge of communication and perception theories and relate them to marketing issues in the agri-food sector and to nutrition education policies.
- are able to elaborate, organize and present their results.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	20	3,0	45,0	75,0
S	during the semester		English	20	1,0	15,0	45,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780765229]		graded	English	70%
Presentation [780765228]		graded	English	30%

Academic Achievements

Module Title: Communication in the Food Sector
Module ID/Code: MAC-220 [780765220]
10. Module coordination
Module coordinator
Dr. Johannes Simons
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Ethics in Food Consumption and Production

Module ID/Code: MAC-230 [780765230]

1. Content and intended learning outcomes

Learning content:	- Introduction to ethics: ethical theories, ethical arguments - Application of ethical reasoning to food topics (e. g., global hunger, food biotechnology, livestock welfare/animal rights). - Ethics and consumer choice: determinants of (non-)ethical consumption (behavioural consumer models); influencing consumer choice (e.g. food labelling policies; nudges). - Ethics and businesses (in the food sector): Role of businesses in society, Corporate Social Responsibility (CSR) related concepts, effects of CSR (empirical evidence), CSR communication. - Case studies regarding ethical consumerism and CSR in the food sector.

Learning outcomes

After a successful completion of the course, the students…
- are able to describe ethical theories and theories and concepts related to responsible firm conduct.
- can explain ethical arguments and different views regarding the role of businesses in society.
- summarise relevant empirical studies investigating responsible/ ethical behaviour.
- can apply relevant theories and concepts to ethical issues in the food sector.
- can critically assess ethical cases with relevance to the food sector.
- are able to conduct their own evaluation of a specific case linked to the food sector.
- are able to discuss and reflect on own findings and on research of others.
- have developed skills in producing a scientific presentation.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.
M.Ed. Agricultural Science (Teacher's Training)	E	1.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Ethics in Food Consumption and Production	English	20	2,4	36,0	50,0
T	during the semester	Discussion of ethical issues related to (food) consumption and production	English	20	0,8	12,0	20,0
PS	during the semester	Case studies regarding ethics in the food sector.	English	20	0,8	12,0	50,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

Module Title: Ethics in Food Consumption and Production				
Module ID/Code: MAC-230 [780765230]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Project work [780765239]		graded	English	60%
Assignment [780765238]		graded	English	40%
Academic Achievements				
10. Module coordination				
Module coordinator				
Prof. Dr. Monika Hartmann				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				

Module Title: Seminar Markets and Consumers

Module ID/Code: MAC-300 [780765300]

1. Content and intended learning outcomes

Learning content:	In depth insights into a topical issue linked to agricultural and food markets, food marketing or consumer behavior. Knowledge with respect to research techniques (e.g. literature search, gathering and analysing data), paper writing (structuring research papers, technical writing guidelines) and presentation and discussion of own results as well as moderation of discussions.

Learning outcomes

After a successful completion of the course, the students…
- recall relevant results of the current state of research into the selected topic.
- are able to identify and and explain theories and methods from the fields of microeconomics, industrial economics marketing and/ or behavioral economics relevant to the selected topic.
- are able to autonomously apply theories and methods from the fields of microeconomics, industrial economics marketing and/ or behavioral economics relevant to the selected topic.
- are able to derive testable hypotheses or research questions from relevant theoretical models and from a review of the relevant literature.
- acquired expertise in gathering primary data or identifying suitable secondary data and in analysing the data.
- are able to discuss and reflect on own findings and on research of others.
- are able to write a scientific paper.
- are able to create a scientific presentation.
- are able to moderate a session.

2. Prerequisites

obligatory	
recommended	BAS-110; MAC-210 or APO-220
Maximum number of students	12 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Marketing and Market Analysis	English	12	4,0	60,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780765309]	Regular participation	graded	English	70%
Presentation [780765308]	Regular participation	graded	English	30%

Academic Achievements

Module Title: Seminar Markets and Consumers
Module ID/Code: MAC-300 [780765300]
10. Module coordination
Module coordinator
Prof. Dr. Monika Hartmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Special Project in Market and Consumer Research

Module ID/Code: MAC-310 [780765310]

1. Content and intended learning outcomes

Learning content:	Topic from the field of Market and Consumer Research. On the topic and form of deliverable(s) (e.g. term paper, poster) student and coordinator of the module have to agree.

Learning outcomes

After a successful completion of the course, the students…
- can research topic in the field of market and consumer research.
- are able to identify and explain theory/ies and method(s) relevant for their research project.
- can apply (an) appropriate theory/ies and method(s) for their research project.
- identify and select appropriate methods in data analysis.
- are able to select (an) appropriate theory/ies and method(s) for their research project and evaluate own research results.
- can reflect their own research results against the state of the art in the field of their research project.

2. Prerequisites

obligatory	Two MAC modules have to be completed with the simple average at or below 1.3
recommended	MAC-210 or APO-220
Maximum number of students	3 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2./3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
PS	during the semester		English	3	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Project work [780765319]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Monika Hartmann

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Advanced Applied Econometrics

Module ID/Code: APO-230 [780763230]

1. Content and intended learning outcomes

Learning content:	- Review of the General Linear Model, OLS and GLS practicing matrix algebra - Model specification (functional form and variable choice) - Endogenous regressors (instrumental variable estimation, Generalised Method of Moments, identification strategies) - Panel data analysis - Maximum Likelihood Estimation - Limited dependent variable models

Learning outcomes

After a successful completion of the course, the students…
- are able to correctly interpret excerpts from econometric textbooks and articles.
- are able to apply matrix algebra in the context of statistics.
- are capable of applying econometric methods to estimate quantitative economic models derived from economic theory.
- select appropriate econometric methods based on the analysis of the data situation and research question.
- correctly use and interpret outputs from econometric software packages.

2. Prerequisites

obligatory	Passed exam in module BAS-110
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Advanced Applied Econometrics	English	120	3,0	45,0	40,0
T		Advanced Applied Econometrics	English	20	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763239]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

11. Further information

Module Title: Food security and sustainable food systems

Module ID/Code: APO-260 [780763260]

1. Content and intended learning outcomes

Learning content:	Students will learn to look at agriculture and nutrition through a food systems lens and understand synergies and tradeoffs between human health and planetary health goals. Concepts and measurement of food security, dietary quality, and the triple burden of malnutrition, as well as related policy interventions, will be discussed. Links between agriculture, biodiversity, climate change, diets, nutrition, and health will be analyzed from a global perspective and with empirical examples from low-, middle-, and high-income countries. Case studies will be used to evaluate specific food systems topics from a comprehensive sustainable development perspective. Case studies will include topics such as organic farming, GMOs, meat consumption, palm oil, nutrition-sensitive agriculture, and the supermarket revolution, among others.

Learning outcomes

After a successful completion of the course, the students…
- are able to define key terms related to food security and sustainable diets.
- can explain how food systems relate to the various sustainable development goals (SDGs).
- can identify policy needs and analyze the sustainability implications of specific interventions.
- can evaluate the arguments in the public debate around sustainable agriculture and nutrition.
- can construct and use dietary surveys and nutrition assessment tools.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	3.
M.Sc. Nutrition Science	E	3.
M.Sc. Molecular Food Technology	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	120	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763269]		graded	English	

Academic Achievements

Module Title: Food security and sustainable food systems
Module ID/Code: APO-260 [780763260]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Food, Health and Policy: A multidisciplinary Problem Based Learning perspective

Module ID/Code: MAC-320 [780765320]

1. Content and intended learning outcomes

Learning content:	Through Problem-based learning (PBL), this course aims to challenge students to develop critical thinking skills and a systems approach to policy-making problems. In a dynamic and creative environment, students will be required to apply nexus thinking to understand problematics, reflect on potential solutions, and create policy recommendations. PBL is an active learning methodology that can enhance knowledge retention and increase motivation, among other benefits. By discussing the unique characteristics of the cases presented in class, students will not only gain an understanding of the underlying policy theories but will also be tasked with developing practical approaches to solving the problems that combine health and food debates. Drawing on the concepts of Utopia/Dystopia, foodscapes/health scares, culture, and diet-related diseases, students will go beyond mere case analysis and generate innovative solutions with an open-minded approach To facilitate this process, students will be organized into small subgroups for hands-on training and provided with limited introductory lectures. The majority of their learning experience will involve working in diverse groups and receiving guidance through tutoring sessions that support the development of their final written and oral group presentations.

Learning outcomes

After a successful completion of the course, the students…
- Develop this interrelated multidisciplinary critical thinking.
- Explain how food systems relate to health system.
- Understand and explain social, cultural, and technical relations between food systems, health, and policies.
- Approach the learning of food, health and policy with critical and creative methodologies to increase undersanding, keep complexity and improve science communication.
- Critically evaluate and synthesise food policies; interpret the problem definition, assumptions, and effects on the current food and health system, and comprehend the implications of specific interventions.
- Identify policies, generate arguments to develop recommendations that tackle challenges at the nexus of food, health, and society.
- Summarize and translate results of policy analysis with a sustainability approach in mind, with the objective to achieve effective science communication.

2. Prerequisites

obligatory	none
recommended	- Ernährungspolitik (BSc.) with Prof. Dr. Dominic Lemken - From AFECO MSc: MAC and APO track.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Nutrition Science	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Dystopi,Food and health system,policy analysis	English	20	1,0	11,0	8,0
T*	during the semester	Case study, Nourishing frame	English	20	1,0	11,0	26,0
Proj* (blocked)	full-day block	Case study, Creative communication	English	0	0,0	0,0	34,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	90	1	3,0

Module Title: Food, Health and Policy: A multidisciplinary Problem Based Learning perspective				
Module ID/Code: MAC-320 [780765320]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Report [780765329]	Regular participation. At least 75% presence (Including Hybrid sessions)	graded	English	70%
Presentation [780765328]	Full participation	graded	English	30%
Academic Achievements				
10. Module coordination				
Module coordinator				
Prof. Dr. Dominic Lemken				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
We intend to take advantage of the hybrid approach that can be used in teaching. Therefore some lectures will be in person and some online.				

Module Title: Research Seminar in Market and Consumer Research

Module ID/Code: MAC-330 [780765330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal, presentations of the state of the art in a thematic field of Market and Consumer Research; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- gained proficiency in synthesizing the state of the art in the field of their research project.
- are able to select and comprehend (an) appropriate theory/ies for their research project.
- know how to derive testable hypotheses or research questions from relevant theoretical models and from a review of the relevant literature.
- have decided for an appropriate methodology to be applied in their research project.
- are able to plan a research project.
- can moderate and conduct a scientific discussion.
- can give examples for a number of research topics in the field and explain the results.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	MAC-210 or APO-220
Maximum number of students	10 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for MAC	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Guidelines, Presentations, Discussions, Feedback Sessions	English	10	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780765339]	Regular participation (see below)	graded	English	67%
Presentation [780765338]	Regular participation (see below)	graded	English	33%

Academic Achievements

Module Title: Research Seminar in Market and Consumer Research
Module ID/Code: MAC-330 [780765330]
10. Module coordination
Module coordinator
Prof. Dr. Monika Hartmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Regular participation is requested to learn from others (regarding topics, methods, presentation styles), gain experience how to moderate and discuss other topics.

Minor Development Economics (DEV)

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: Development Economics

Module ID/Code: APO-240 [780763240]

1. Content and intended learning outcomes

Learning content:	Empirical patterns in economic development, economic growth models, causes of differential economic growth and development across countries, including the role of institutions, labor markets and migration. Sustainable management of natural resources for development and poverty reduction: key theoretical concepts, critical discussion of empirical policy problems, specifically, regarding water and land management, energy access and transition, the impact of high resource endowments on development, opportunities and challenges posed by climate change in developing countries.

Learning outcomes

After a successful completion of the course, the students…
- are able to describe key concepts and structure of economic growth models and drivers of socio-economic development.
- can explain the role of institutions, labor markets, migration and sustainable natural resource management for economic development.
- are able to apply learned concepts for analysis of development polices.
- can contrast methods for conducting research on sustainable natural resource management topics.
- will appraise empirical examples through case studies.
- are able to generalize lessons learnt from case studies to broader development issues.

2. Prerequisites

obligatory	
recommended	Modules "Advanced Applied Econometrics", "Research Seminar on agricultural and development policy" and "Economics of Sustainability"
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Development Economics	English	25	2,0	30,0	60,0
T	during the semester	Assignement	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763249]		graded	English	

Academic Achievements

Module Title: Development Economics
Module ID/Code: APO-240 [780763240]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Module Title: Impact evaluation of conservation & development projects and environmental policies

Module ID/Code: ENV-130 [780764130]

1. Content and intended learning outcomes

Learning content:	- Role of impact evaluation in guiding the design of development and environmental conservation initiatives - Understanding and developing a theory of change - Overview, hands-on application, and critical assessment of quantitative evaluation methods including experimental and quasi-experimental research designs - Evaluation case studies; advanced topics, such as impact heterogeneity and mediation analysis.

Learning outcomes

After a successful completion of the course, the students…
- know alternative quantitative evaluation methods and their underlying assumptions.
- understand how different types of biases affect evaluations of development and conservation initiatives.
- apply selected evaluation methods to real world problems.
- critically interpret findings from evaluation studies.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Impact Evaluation	English	25	2,0	30,0	60,0
T	during the semester	Exercise	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780764139]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Food security and sustainable food systems

Module ID/Code: APO-260 [780763260]

1. Content and intended learning outcomes

Learning content:	Students will learn to look at agriculture and nutrition through a food systems lens and understand synergies and tradeoffs between human health and planetary health goals. Concepts and measurement of food security, dietary quality, and the triple burden of malnutrition, as well as related policy interventions, will be discussed. Links between agriculture, biodiversity, climate change, diets, nutrition, and health will be analyzed from a global perspective and with empirical examples from low-, middle-, and high-income countries. Case studies will be used to evaluate specific food systems topics from a comprehensive sustainable development perspective. Case studies will include topics such as organic farming, GMOs, meat consumption, palm oil, nutrition-sensitive agriculture, and the supermarket revolution, among others.

Learning outcomes

After a successful completion of the course, the students…
- are able to define key terms related to food security and sustainable diets.
- can explain how food systems relate to the various sustainable development goals (SDGs).
- can identify policy needs and analyze the sustainability implications of specific interventions.
- can evaluate the arguments in the public debate around sustainable agriculture and nutrition.
- can construct and use dietary surveys and nutrition assessment tools.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.
M.Sc. Agricultural Science and Resource Management in the Tropics and Subtropics (ARTS)	E	3.
M.Sc. Nutrition Science	E	3.
M.Sc. Molecular Food Technology	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester		English	120	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Written exam [780763269]		graded	English	

Academic Achievements

Module Title: Food security and sustainable food systems
Module ID/Code: APO-260 [780763260]
10. Module coordination
Module coordinator
Prof. Dr. Matin Qaim
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Minor Agroeconomic Modelling (MOD)

Requirements for the Minor Specification:
- Modules accounting to a minimum of 18 ECTS-CP in the Minor Specification

Every module can only be accounted once i.e. either for the Major or Minor Specification.

Module Title: Applied Modelling of Agricultural Systems

Module ID/Code: APO-220 [780763220]

1. Content and intended learning outcomes

Learning content:

In this course, the students jointly develop an or improve an existing partial or general equilibrium model and apply it to a topic chosen by them:

- Decision on the topic to analyze - the supervisor will propose topics based on contact to institutions such as OECD, FAO or the EU Commission
- Decision on the appropriate type of simulation model (partial or general equilibrium, details on model structure) to apply
- Acquisition of the necessary data and parameters
- Coding of the model respectively the changes to an exisiting model
- Mapping of the policy question into an appropriate shock definition of the equilibrium model
- Performing and analyzing counterfactual runs
- Documentation of the model (online, report)
- Preparation of a presentation (ca. 30-45 minutes) and a report (ca. 50 page) for the client

Students will present and disucss their findings after the end of the term in a video-conference or a meeting with the client with whom they will also share their report. The students organize the work themselves (milestones and their timining, labour division in groups). The supervisor will monitor and support the process when needed, especially with regard to technical and methodological questions.

Learning outcomes

After a successful completion of the course, the students…
- will have successfully applied a policy relevant equilibrium model.
- will have analyzed a real-world policy question based on quantitative tools.
- will have evaluated the impact of changes in policies on quantities, prices and welfare based on the application on the chosen and expanded equilibrium model.
- will synthetize these impacts in a presentation for the client and jointly document and comment them in a larger report.

2. Prerequisites

obligatory	
recommended	A course on partial and general equilibrium model such as "Partial and General Equilibrium Modelling" APO-250 (offered in 2. term of AFECO program)
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj	during the semester		English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

Module Title: Applied Modelling of Agricultural Systems

Module ID/Code: APO-220 [780763220]

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report (presentation) [780763229]		graded	English	50%
Report [780763228]		graded	English	50%

Academic Achievements

10. Module coordination

Module coordinator

PD Dr. Wolfgang Britz

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Not offered in WS 22/23

Presentation for client will be schuled after end of term, Report has to be handed in 8 weeks after end of term

Students will receive a course license for GAMS. Examples of past clients and themes: FAO (Rome): analysis of climate change impacts on agri-food markets in developing countries; OECD (Paris): analysis of the impact of the US/China trade ware on selected agri-food markets; GIZ (Bonn): analysis of policy options to foster the self-sufficiency in Western African rice markets; World Bank (Washington D.C.): Analysis of climate change impacts on households in selected developing countries in the context of the Socio-Economic Pathway 2

Module Title: Advanced Applied Econometrics

Module ID/Code: APO-230 [780763230]

1. Content and intended learning outcomes

Learning content:	- Review of the General Linear Model, OLS and GLS practicing matrix algebra - Model specification (functional form and variable choice) - Endogenous regressors (instrumental variable estimation, Generalised Method of Moments, identification strategies) - Panel data analysis - Maximum Likelihood Estimation - Limited dependent variable models

Learning outcomes

After a successful completion of the course, the students…
- are able to correctly interpret excerpts from econometric textbooks and articles.
- are able to apply matrix algebra in the context of statistics.
- are capable of applying econometric methods to estimate quantitative economic models derived from economic theory.
- select appropriate econometric methods based on the analysis of the data situation and research question.
- correctly use and interpret outputs from econometric software packages.

2. Prerequisites

obligatory	Passed exam in module BAS-110
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L		Advanced Applied Econometrics	English	120	3,0	45,0	40,0
T		Advanced Applied Econometrics	English	20	1,0	15,0	80,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Assignment [780763239]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

11. Further information

Module Title: Partial and General Equilibrium Modelling

Module ID/Code: APO-250 [780763250]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are simulation models acting at market scale?
2. Introduction to GAMS
- Language structure
- A single market model in GAMS
3. Multi-Commodity models (MCMs)
- A simple multi-market model in GAMS
- Introducing policy instruments in a MCM
- Armington approach and spatial arbitrage
- Presentation of three MCMs: the Policy Evaluation Model of the OECD, the AgriSpace model for Norway and CAPRI
4. Computable General Equilibrium models
- The structure of a Social Accounting Matrix
- Typical structure of a CGE (production function, final demand, trade representation)
- SAM calibration and calibrating a CGE against the SAM
- Trade in CGEs (Armington, CET, Melitz model)
- Scenario analysis with CGEBox

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of partial and general equilibrium models and describe the interactions inside and between these building blocks as expressed in their equations.
- will be able to change equilibrium models in the software package GAMS and conduct counterfactual analysis.
- will be able to analyze the outcome of such models against the background of micro-economic theory and their knowledge of agri-food markets and more general of the economic system.
- will be able to evaluate the impact of changes in policies on quantities, prices and welfare based on the application of equilibrium models.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS 130. That course is obligatory in the AFECO program. A course on Global Food Markets and Systems (BAS 140) is helpful.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763259]		graded	English	

Academic Achievements

Module Title: Partial and General Equilibrium Modelling
Module ID/Code: APO-250 [780763250]
10. Module coordination
Module coordinator
PD Dr. Wolfgang Britz
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.

Module Title: Bio-Economic Modelling At Farm-Scale

Module ID/Code: ENV-240 [780764240]

1. Content and intended learning outcomes

Learning content:

1. Introduction: Why do we need simulation models? What are farm-scale simulation models?
2. Introduction to Linear Programming
2.1 Assumptions of Linear Programming
2.2 Primal and dual solution
3. Introduction to GAMS
3.1 Language structure
3.2 A first simple GAMS model of a farm
4. Modelling core bio-economic interactions at farm scale
4.1 Herd dynamics, requirements and cost minimal feed mix
4.2 Crops, rotations, cropping intensity
4.3 Labour use
4.4 Combing the elements, integrating environment indicators
5. Modeling Investments and Financing Decisions
5.1 Maximizing Net Present Value
5.2 Accounting for depreciation
5.3 Indivisibilities in investments
5.4 Full financial plan and income tax
6. Modeling Risk and risk behavior
6.1 State of nature, decision under uncertainty, MOTAD and Target MOTAD
6.2 State contingent decision variables
6.3 Dynamic stochastic programming

Learning outcomes

After a successful completion of the course, the students…
- will be able to outline the building blocks of farm-scale bio-economic models and describe the interactions inside and between various sub-systems inside a farm as expressed in a formal optimization model.
- will be able to write simple or change more complex farm-scale bio-economic models in the software package GAMS.
- will be able to analyze the outcome of such a model against the background of micro-economic theory.
- will be able to evaluate the impact of drivers of farm management decisions such as changes in input/output prices or farm-scale policies on economic and environmental indicators based on the application of a bio-economic model.
- will be able to synthetize these impacts in a short report.

2. Prerequisites

obligatory	
recommended	A microeconomics course at master level such as BAS-130 and a course on risk management such as BAS-150. Both courses are obligatory in the AFECO program.
Maximum number of students	20 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L+T	during the semester	includes regular reading and coding assigments	English	20	4,0	56,0	124,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

Module Title: Bio-Economic Modelling At Farm-Scale				
Module ID/Code: ENV-240 [780764240]				
9. Requirements for the rewarding of credits (ECTS)				
Types of Assessment	**Prerequisites for admission to the Assessment**	**Graded yes/no**	**Language (exam)**	**Weighting factor**
Term paper [780764249]		graded	English	
Academic Achievements				
10. Module coordination				
Module coordinator				
PD Dr. Wolfgang Britz				
Teaching person				
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/				
Institute/ Department				
Agrar-, Forst- und Ernährungswissenschaften				
11. Further information				
Students will receive a course license for GAMS. All material including the software code, slides used for teaching are made available via E-Campus. The term paper has to be handed in 8 weeks after semester end.				

Module Title: Advanced Environmental Economics

Module ID/Code: ENV-210 [780764210]

1. Content and intended learning outcomes

Learning content:	Critical interpretation and discussion of theoretical models and applications in environmental and resource economics. Examples from forest and biodiversity conservation, pollution and waste, non-renewable resources, trans-boundary resource use, and international environmental agreements.

Learning outcomes

After a successful completion of the course, the students…
- know alternative theoretical approaches in environmental and resource economics.
- understand the implications of assumptions in formal economic models for real world applications.
- apply theory and numerical techniques to solve common problems in environmental and resource economics.

2. Prerequisites

obligatory	
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Advanced Environmental Economics	English	25	2,0	30,0	0,0
T	during the semester	Assignment	English	25	2,0	30,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Oral exam [20 min] [780764219]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R

Module ID/Code: ENV-270 [780764270]

1. Content and intended learning outcomes

Learning content:	Students will learn how to effectively prepare and visualize data and research results in different ways. Different types of data visualization in particular different kinds of plotting methods will be shown and applied in exercises. Particular emphasis will be given to spatial data and GIS analyses. Students will learn about the basics of GIS and spatial data projections, different spatial data types including raster and vector data, how to import and visualize them and how to combine them in spatial analyses. They will specifically learn how to work with spatial data in R and how to use this free and open source tool to visualize their results in publication ready maps. Students will apply the methods to visualize data of their own choice and present their results during the course.

Learning outcomes

After a successful completion of the course, the students…
- understand the peculiarities of different data formats and how to work with them.
- understand the basics of GIS.
- are able to work with different data in R.
- are able to visualize different data in R.
- conduct spatial analyses with data of different formats.
- are able to apply the packages and methods learned to their own case studies.
- are able to conduct their own analyses and to visualize publication-ready maps.

2. Prerequisites

obligatory	
recommended	Experience with R (programming) is recommended
Maximum number of students	25 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	E	2.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
L	during the semester	Data Wrangling, Visualization and GIS Data Analysis with R	English	25	2,0	30,0	60,0
T	during the semester	Solving Exercises Together	English	25	2,0	30,0	60,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report [780764279]		graded	English	50%
Presentation [780764278]	Submission of all reports	graded	English	50%

Academic Achievements

Module Title: Data Wrangling, Visualization and GIS Data Analysis with R
Module ID/Code: ENV-270 [780764270]
10. Module coordination
Module coordinator
Jun.-Prof. Dr. Lisa Biber-Freudenberger
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information

Practice-oriented Track for Major „Agribusiness“

Each of the four AFECO major tracks (Agribusiness – ABS, Agricultural and Development Policy – APO, Resource and Environmental Economics – ENV, and Consumer and Market Research – MAC) can be combined with a compulsory internship, a research seminar linking the pratice-oriented experience with the development of a research proposal, and with a Master thesis rooted in the work carried out during the internship. This amounts to the completion of a “Practice-oriented Track in [the chosen thematic major track]”.

Students electing to follow a practice-oriented track for their major need to combine the following elements to complete their master program:

- Compulsory modules of the practice-oriented major, in the selected track and amounting to 42 ECTS-CP (the compulsory internship (6 ECTS-CP), the practice-oriented Research Seminar (6 ECTS-CP) and the practice-oriented Master thesis (30 ECTS-CP)

- Elective modules of the selected track amounting to 30 ECTS-CP (as per elective modules listed for each of the Major tracks above)

- Elective and / or free elective modules amounting to 18 ECTS-CP

Module Title: Internship in Agricultural and Food Economics

Module ID/Code: ILR-02 [780760010]

1. Content and intended learning outcomes

Learning content:	Students learn to apply knowledge and skills acquired during the course of study, to execute certain professional skills better and to work independently and expand the professional network. The internship includes a minimum of four weeks of full time work in a relevant field outside the university. It can be performed at research institutes, private companies or governmental and non-governmental institutions. The internship is completed by an internship report and a presentation in class.

Learning outcomes

After a successful completion of the course, the students…
- are able to transfer theoretical knowledge into the professional work environment.
- have aquired knowledge and skills in a professional work environment.
- have the ability to present experiences.
- have gained enhanced reflexion capability on own expectations and experiences.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.-4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
I* (blocked)	full-day block		English	1	0,5	10,0	170,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none				

Academic Achievements

- minimum of four weeks of full time work in a relevant field outside the university
- internship report and presentation

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

* the internship must be arranged by the students and authorized by the internship coordinator prior to the starting date
* only internships completed after award of the Bsc. degree can be considered
language can be German or English

Module Title: Practice-oriented Research Seminar in Agribusiness

Module ID/Code: ABS-331 [780762330]

1. Content and intended learning outcomes

Learning content:	Literature reviews, preparation of a research concept and a thesis proposal; scientific presentations and discussions of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- can describe the problem background of a chosen topic after conducting a literature review.
- can infer a research question or a testable hypothesis from a problem statement.
- can assess, select and compare state-of-the-art research articles in the relevant field.
- have determined an approproate methodology relevant for the research question(s).
- have developed the concept of their Master thesis, including work plan and expected outcomes.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	ABS-120 Methods in Management Research
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for ABS	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	30	2,0	60,0	20,0
S*	during the semester	Own research, writing a term paper	English	30	0,0	0,0	100,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Report (presentation) [780762339]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Dr. Daniel Hermann

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Writing guidelines and info leaflet about the Master thesis process can be found under: https://www.afeco.uni-bonn.de/while-studying

Module Title: Practice-oriented Masterthesis

Module ID/Code: M-402 [8900]

1. Content and intended learning outcomes

Learning content:	Independent work on a research project in the field of the research groups within a given time frame. Details are specified in the examination regulation and examination organization regulation (available only in German). The topic addressed in the thesis must be chosen with the supervisor and thematic links shall be made to the compulsory internship ILR-02.

Learning outcomes

After a successful completion of the course, the students…
- can work independently and efficiently.
- know how to handle feedback from supervisors.
- can define a practice-oriented research question.
- can build a sound theoretical and methodological framework.
- can collect data in a systematic and verifiable manner.
- analyse data critically and correctly.
- can formulate sound conclusions based on a comprehensive discussion of the results.
- can write a comprehensive, consistent and concise thesis.
- The editing time is a minimum of two and a maximum of six months.

2. Prerequisites

obligatory	Registered in either ABS-331 or ENV-331 or MAC-331 or APO-331 depending on the research group of the supervisors and completed at least 60 CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj (blocked)	full-day block	Research project work	English	1	0,0	15,0	885,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	900	1	30,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Masterthesis [8900]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

All independent teaching staff

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Practice-oriented Track for Major „Agricultural and Development Policy“

Each of the four AFECO major tracks (Agribusiness – ABS, Agricultural and Development Policy – APO, Resource and Environmental Economics – ENV, and Consumer and Market Research – MAC) can be combined with a compulsory internship, a research seminar linking the pratice-oriented experience with the development of a research proposal, and with a Master thesis rooted in the work carried out during the internship. This amounts to the completion of a “Practice-oriented Track in [the chosen thematic major track]”.

Students electing to follow a practice-oriented track for their major need to combine the following elements to complete their master program:

- **Compulsory modules of the practice-oriented major, in the selected track and amounting to 42 ECTS-CP (the compulsory internship (6 ECTS-CP), the practice-oriented Research Seminar (6 ECTS-CP) and the practice-oriented Master thesis (30 ECTS-CP)**
- **Elective modules of the selected track amounting to 30 ECTS-CP (as per elective modules listed for each of the Major tracks above)**
- **Elective and / or free elective modules amounting to 18 ECTS-CP**

Module Title: Internship in Agricultural and Food Economics

Module ID/Code: ILR-02 [780760010]

1. Content and intended learning outcomes

Learning content:	Students learn to apply knowledge and skills acquired during the course of study, to execute certain professional skills better and to work independently and expand the professional network. The internship includes a minimum of four weeks of full time work in a relevant field outside the university. It can be performed at research institutes, private companies or governmental and non-governmental institutions. The internship is completed by an internship report and a presentation in class.

Learning outcomes

After a successful completion of the course, the students…
- are able to transfer theoretical knowledge into the professional work environment.
- have aquired knowledge and skills in a professional work environment.
- have the ability to present experiences.
- have gained enhanced reflexion capability on own expectations and experiences.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.-4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
I* (blocked)	full-day block		English	1	0,5	10,0	170,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none				

Academic Achievements

- minimum of four weeks of full time work in a relevant field outside the university
- internship report and presentation

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

* the internship must be arranged by the students and authorized by the internship coordinator prior to the starting date
* only internships completed after award of the Bsc. degree can be considered
language can be German or English

Module Title: Practice-oriented Research Seminar in Agricultural and Development Policy

Module ID/Code: APO-331 [780763330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal, presentations of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- can describe the problem background of a chosen topic after conducting a literature review.
- can infer a research question or a testable hypothesis from a problem statement.
- can assess, select and compare state-of-the-art research articles in the relevant field.
- have determined an appropriate methodology relevant for the research question(s) after evaluation of alternative approaches.
- have developed the concept of their Master thesis, including work plan and expected outcomes.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for APO	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	15	2,0	30,0	30,0
S*	during the semester	Own research, writing term paper	English	15	0,0	0,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780763339]	Regular participation to learn from others	graded	English	67%
Presentation [780763338]	Regular participation to learn from others	graded	English	33%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Thomas Heckelei

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Practice-oriented Masterthesis

Module ID/Code: M-402 [8900]

1. Content and intended learning outcomes

Learning content:	Independent work on a research project in the field of the research groups within a given time frame. Details are specified in the examination regulation and examination organization regulation (available only in German). The topic addressed in the thesis must be chosen with the supervisor and thematic links shall be made to the compulsory internship ILR-02.

Learning outcomes

After a successful completion of the course, the students…
- can work independently and efficiently.
- know how to handle feedback from supervisors.
- can define a practice-oriented research question.
- can build a sound theoretical and methodological framework.
- can collect data in a systematic and verifiable manner.
- analyse data critically and correctly.
- can formulate sound conclusions based on a comprehensive discussion of the results.
- can write a comprehensive, consistent and concise thesis.
- The editing time is a minimum of two and a maximum of six months.

2. Prerequisites

obligatory	Registered in either ABS-331 or ENV-331 or MAC-331 or APO-331 depending on the research group of the supervisors and completed at least 60 CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj (blocked)	full-day block	Research project work	English	1	0,0	15,0	885,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	900	1	30,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Masterthesis [8900]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

All independent teaching staff

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Practice-oriented Track for Major „Resource and Environmental Economics“

Each of the four AFECO major tracks (Agribusiness – ABS, Agricultural and Development Policy – APO, Resource and Environmental Economics – ENV, and Consumer and Market Research – MAC) can be combined with a compulsory internship, a research seminar linking the pratice-oriented experience with the development of a research proposal, and with a Master thesis rooted in the work carried out during the internship. This amounts to the completion of a “Practice-oriented Track in [the chosen thematic major track]”.

Students electing to follow a practice-oriented track for their major need to combine the following elements to complete their master program:

- **Compulsory modules of the practice-oriented major, in the selected track and amounting to 42 ECTS-CP (the compulsory internship (6 ECTS-CP), the practice-oriented Research Seminar (6 ECTS-CP) and the practice-oriented Master thesis (30 ECTS-CP)**
- **Elective modules of the selected track amounting to 30 ECTS-CP (as per elective modules listed for each of the Major tracks above)**
- **Elective and / or free elective modules amounting to 18 ECTS-CP**

Module Title: Internship in Agricultural and Food Economics

Module ID/Code: ILR-02 [780760010]

1. Content and intended learning outcomes

Learning content:	Students learn to apply knowledge and skills acquired during the course of study, to execute certain professional skills better and to work independently and expand the professional network. The internship includes a minimum of four weeks of full time work in a relevant field outside the university. It can be performed at research institutes, private companies or governmental and non-governmental institutions. The internship is completed by an internship report and a presentation in class.

Learning outcomes

After a successful completion of the course, the students…
- are able to transfer theoretical knowledge into the professional work environment.
- have aquired knowledge and skills in a professional work environment.
- have the ability to present experiences.
- have gained enhanced reflexion capability on own expectations and experiences.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.-4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
I* (blocked)	full-day block		English	1	0,5	10,0	170,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none				

Academic Achievements

- minimum of four weeks of full time work in a relevant field outside the university
- internship report and presentation

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

* the internship must be arranged by the students and authorized by the internship coordinator prior to the starting date
* only internships completed after award of the Bsc. degree can be considered
language can be German or English

Module Title: Practice-oriented Research Seminar in Resource and Environmental Economics

Module ID/Code: ENV-331 [780764330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal; presentations of the state of the art in a thematic field which is close to the research question; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- synthesize the scientific state of the art in a self-selected field of research.
- construct a conceptual framework in social science / environmental economics.
- develop and present a research proposal.
- engage in scientific debates.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	Environmental Economics and Policy, Economics on Sustainability
Maximum number of students	15 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for ENV	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Class discussions, presentations, feedback sessions	English	15	2,0	30,0	30,0
S*	during the semester	Own research, writing term paper	English	15	0,0	0,0	120,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780764339]	Regular participation to learn from others and enable others to learn	graded	English	60%
Presentation [780764338]	Regular participation to learn from others and enable others to learn	graded	English	40%

Academic Achievements

10. Module coordination

Module coordinator

Prof. Dr. Jan Börner

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Module Title: Practice-oriented Masterthesis

Module ID/Code: M-402 [8900]

1. Content and intended learning outcomes

Learning content:	Independent work on a research project in the field of the research groups within a given time frame. Details are specified in the examination regulation and examination organization regulation (available only in German). The topic addressed in the thesis must be chosen with the supervisor and thematic links shall be made to the compulsory internship ILR-02.

Learning outcomes

After a successful completion of the course, the students…
- can work independently and efficiently.
- know how to handle feedback from supervisors.
- can define a practice-oriented research question.
- can build a sound theoretical and methodological framework.
- can collect data in a systematic and verifiable manner.
- analyse data critically and correctly.
- can formulate sound conclusions based on a comprehensive discussion of the results.
- can write a comprehensive, consistent and concise thesis.
- The editing time is a minimum of two and a maximum of six months.

2. Prerequisites

obligatory	Registered in either ABS-331 or ENV-331 or MAC-331 or APO-331 depending on the research group of the supervisors and completed at least 60 CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj (blocked)	full-day block	Research project work	English	1	0,0	15,0	885,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	900	1	30,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Masterthesis [8900]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

All independent teaching staff

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

Practice-oriented Track for Major „Market and Consumer Research“

Each of the four AFECO major tracks (Agribusiness – ABS, Agricultural and Development Policy – APO, Resource and Environmental Economics – ENV, and Consumer and Market Research – MAC) can be combined with a compulsory internship, a research seminar linking the pratice-oriented experience with the development of a research proposal, and with a Master thesis rooted in the work carried out during the internship. This amounts to the completion of a “Practice-oriented Track in [the chosen thematic major track]”.

Students electing to follow a practice-oriented track for their major need to combine the following elements to complete their master program:

- Compulsory modules of the practice-oriented major, in the selected track and amounting to 42 ECTS-CP (the compulsory internship (6 ECTS-CP), the practice-oriented Research Seminar (6 ECTS-CP) and the practice-oriented Master thesis (30 ECTS-CP)

- Elective modules of the selected track amounting to 30 ECTS-CP (as per elective modules listed for each of the Major tracks above)

- Elective and / or free elective modules amounting to 18 ECTS-CP

Module Title: Internship in Agricultural and Food Economics

Module ID/Code: ILR-02 [780760010]

1. Content and intended learning outcomes

Learning content:	Students learn to apply knowledge and skills acquired during the course of study, to execute certain professional skills better and to work independently and expand the professional network. The internship includes a minimum of four weeks of full time work in a relevant field outside the university. It can be performed at research institutes, private companies or governmental and non-governmental institutions. The internship is completed by an internship report and a presentation in class.

Learning outcomes

After a successful completion of the course, the students…
- are able to transfer theoretical knowledge into the professional work environment.
- have aquired knowledge and skills in a professional work environment.
- have the ability to present experiences.
- have gained enhanced reflexion capability on own expectations and experiences.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.-4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
I* (blocked)	full-day block		English	1	0,5	10,0	170,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none				

Academic Achievements

- minimum of four weeks of full time work in a relevant field outside the university
- internship report and presentation

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

* the internship must be arranged by the students and authorized by the internship coordinator prior to the starting date
* only internships completed after award of the Bsc. degree can be considered
language can be German or English

Module Title: Practice-oriented Research Seminar in Market and Consumer Research

Module ID/Code: MAC-331 [780765330]

1. Content and intended learning outcomes

Learning content:	Literature studies, preparation of a research concept and a proposal, presentations of the state of the art in a thematic field of Market and Consumer Research; scientific discussion of own research topic and topic of others in the seminar.

Learning outcomes

After a successful completion of the course, the students…
- gained proficiency in synthesizing the state of the art in the field of their research project.
- are able to select and comprehend (an) appropriate theory/ies for their research project.
- know how to derive testable hypotheses or research questions from relevant theoretical models and from a review of the relevant literature.
- have decided for an appropriate methodology to be applied in their research project.
- are able to plan a research project.
- can moderate and conduct a scientific discussion.
- can give examples for a number of research topics in the field and explain the results.

2. Prerequisites

obligatory	48 ECTS-CP
recommended	MAC-210 or APO-220
Maximum number of students	10 students

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C for MAC	3.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
S*	during the semester	Guidelines, Presentations, Discussions, Feedback Sessions	English	10	2,0	30,0	150,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Term paper [780765339]	Regular participation (see below)	graded	English	67%
Presentation [780765338]	Regular participation (see below)	graded	English	33%

Academic Achievements

Module Title: Practice-oriented Research Seminar in Market and Consumer Research
Module ID/Code: MAC-331 [780765330]
10. Module coordination
Module coordinator
Prof. Dr. Monika Hartmann
Teaching person
The teaching persons in the current semester can be found in basis: https://basis.uni-bonn.de/
Institute/ Department
Agrar-, Forst- und Ernährungswissenschaften
11. Further information
Regular participation is requested to learn from others (regarding topics, methods, presentation styles), gain experience how to moderate and discuss other topics.

Module Title: Practice-oriented Masterthesis

Module ID/Code: M-402 [8900]

1. Content and intended learning outcomes

Learning content:	Independent work on a research project in the field of the research groups within a given time frame. Details are specified in the examination regulation and examination organization regulation (available only in German). The topic addressed in the thesis must be chosen with the supervisor and thematic links shall be made to the compulsory internship ILR-02.

Learning outcomes

After a successful completion of the course, the students…
- can work independently and efficiently.
- know how to handle feedback from supervisors.
- can define a practice-oriented research question.
- can build a sound theoretical and methodological framework.
- can collect data in a systematic and verifiable manner.
- analyse data critically and correctly.
- can formulate sound conclusions based on a comprehensive discussion of the results.
- can write a comprehensive, consistent and concise thesis.
- The editing time is a minimum of two and a maximum of six months.

2. Prerequisites

obligatory	Registered in either ABS-331 or ENV-331 or MAC-331 or APO-331 depending on the research group of the supervisors and completed at least 60 CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj (blocked)	full-day block	Research project work	English	1	0,0	15,0	885,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	900	1	30,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Masterthesis [8900]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

All independent teaching staff

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

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11. Further information

Free elective module

A maximum of 12 ECTS-CP can be completed from free elective modules.

Module Title: Internship in Agricultural and Food Economics

Module ID/Code: ILR-01 [780760010]

1. Content and intended learning outcomes

Learning content:	Students learn to apply knowledge and skills acquired during the course of study, to execute certain professional skills better and to work independently and expand the professional network. The internship includes a minimum of four weeks of full time work in a relevant field outside the university. It can be performed at research institutes, private companies or governmental and non-governmental institutions. The internship is completed by an internship report and a presentation in class.

Learning outcomes

After a successful completion of the course, the students…
- are able to transfer theoretical knowledge into the professional work environment.
- have aquired knowledge and skills in a professional work environment.
- have the ability to present experiences.
- have gained enhanced reflexion capability on own expectations and experiences.

2. Prerequisites

obligatory	
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	2.-4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
I* (blocked)	full-day block		English	1	0,5	10,0	170,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	180	1	6,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
none				

Academic Achievements

- minimum of four weeks of full time work in a relevant field outside the university
- internship report and presentation

10. Module coordination

Module coordinator

Dr. Nicolas Gerber

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information

* the internship must be arranged by the students and authorized by the internship coordinator prior to the starting date
* only internships completed after award of the Bsc. degree can be considered
language can be German or English

Modultitel:	**Seminar zur Betriebsentwicklung im Organischen Landbau**
Modulnr./-code:	NPW-052 [780800520]

1. Inhalt und Qualifikationsziele

Inhalte:	Inhalte sind die Analyse des Ist-Zustands realer ökologisch wirtschaftender Betriebe bzw. konventioneller Umstellungsbetriebe und Erarbeitung von Optimierungspotenzialen hinsichtlich Fruchtfolgegestaltung, Nährstoff- und Humusbilanz, Tierhaltung und -fütterung, Umwelt- und Naturschutzleistungen sowie Arbeitsorganisation und Betriebswirtschaft. In Kleingruppen von Studierenden werden die Bereiche Pflanzenbau, Tierhaltung, Ökonomie und Naturschutz bearbeitet. Die Gruppen zu Pflanzenbau und Naturschutz werden durch Lehrende des Fachgebietes AOL betreut, die Gruppen zu Tierhaltung und Ökonomie haben die Möglichkeit sich mit Öko-FachberaterInnen auszutauschen. Im Wintersemester werden nach einer gemeinsamen Vorbesprechung auf einer gemeinsamen Exkursion, evtl. ergänzt durch weitere, individuelle Besuche der Studierenden, die nötigen Daten mittels BetriebsleiterInnenbefragung gesammelt. Die Daten werden in der Mitte des Semesters im Rahmen eines Kolloquiums qualitativ dargestellt, und die Studierenden legen ein Konzept dafür vor, wie sie die Daten im Laufe des Semesters für die quantitative Abbildung des Ist-Zustands und die Analyse eines gemeinsam festgelegten Optimierungspotenzials nutzen werden. Die Daten werden dann unter Zuhilfenahme von validierten Methoden (u.a. Naturschutzleistungen: ÖKABB und Methode nach Gottwald und Stein-Bachinger 2016) und geeigneter Software (z.B. Nährstoff- und Humusbilanzen: REPRO, Fruchtfolgeplanung: ROTOR) ausgewertet. Abschließend werden die Ergebnisse mit den BetriebsleiterInnen und FachberaterInnen diskutiert.

Qualifikationsziele/ Kompetenzen

Nach erfolgreichem Abschluss des Moduls, können die Studierenden…
- vorhandenes Grundlagenwissen aus dem Bachelorstudium vertiefen und verknüpfen.
- multifunktionale Effekte landwirtschaftlicher Betriebe verstehen und benennen.
- mit verschiedenen Modellen zur Bewertung landwirtschaftlicher Betriebe umgehen.
- einen realen landwirtschaftlichen Betrieb mit moderner Methodik erfassen und optimieren.
- Effekte der landwirtschaftlichen Produktion auf das Agrarökosystem beurteilen.
- Optimierungsansätze auf Betriebsebene auf wissenschaftlicher Basis entwickeln.
- Fachwissen aus der eigenen Spezialisierung im Masterstudium kontextualisieren und interdisziplinär in einer angewandten Fragestellung zusammenführen.
- mit BetriebsleiterInnen und FachberaterInnen kommunizieren.
- autökologische Kenntnisse ausgewählter Arten- bzw. Artengruppen anwenden, um die Bedeutung bestimmter Betriebsrequisiten für die Biodiversität einschätzen zu können.

2. Voraussetzungen für die Teilnahme am Modul

Verpflichtend nachzuweisen	
empfohlen	
Beschränkung der Teilnehmerzahl	25 Studierende

3. Verwendbarkeit des Moduls

Studiengang/Teilstudiengang	**Pflicht/ Wahlpflicht**	**Fachsemester**
M.Sc. Agricultural and Food Economics (AFECO)	fWP	3.
M.Sc. Naturschutz und Landschaftsökologie	fWP	3.
M.Sc. Nutzpflanzenwissenschaften	WP SP PERC	3.
M.Sc. Tierwissenschaften	fWP	3.

4. Lehr- und Lernformen

LV-Art	**Durch-führung**	**Thema**	**Unterrichts-sprache**	**Gruppen-größe**	**SWS**	**Workload [h]**	
						Präsenz-zeit	**Selbst-studium**
S	Semester-begleitend	Datenerhebung, Betriebsanalyse, Optimierung	Deutsch	25	2,0	30,0	150,0

5. Häufigkeit	**6. Arbeitsaufwand [h]**	**7. Dauer**	**8. ECTS-LP**
WS	180	1	6,0

Modultitel:	**Seminar zur Betriebsentwicklung im Organischen Landbau**			
Modulnr./-code:	NPW-052 [780800520]			
9. Voraussetzungen für die Vergabe von Leistungspunkten entsprechend dem ECTS				
Prüfungsform	**Zulassungsvoraussetzung**	**Benotet/ unbenotet**	**Prüfungs-sprache**	**Gewichtung**
Präsentation [780800529]		benotet	Deutsch	33%
Bericht [780800528]		benotet	Deutsch	67%
Studienleistung(en)				
10. Modulorganisation				
Modulverantwortliche(r)				
Prof. Dr. Thomas Döring				
Lehrende(r)				
Die durchführenden Lehrpersonen im aktuellen Semester finden Sie in basis: https://basis.uni-bonn.de/				
Anbietende Organisationseinheit(en)				
Agrar-, Forst- und Ernährungswissenschaften				
11. Sonstiges				
Gottwald F. & Stein-Bachinger K. (2016): Landwirtschaft für Artenvielfalt - Ein Naturschutzmodul für ökologisch bewirtschaftete Betriebe. 2. Auflage, 208 S. www.landwirtschaft-artenvielfalt.de Küstermann, B., Christen, O., Hülsbergen, K.-J., 2009: Modelling nitrogen cycles of farming systems as basis of site- and farm-specific nitrogen management. Agriculture, Ecosystems and Environment. 135, 70-80 Modernes Agrarmanagement: Betriebswirtschaftliche Analyse- und Planungsverfahren | Oliver Mußhoff, Norbert Hirschauer | ISBN: 9783800652525 | Verlag Vahlen 4. Auflage 2016. https://www.beck-elibrary.de/10.15358/9783800644575/modernes-agrarmanagement				

Masterthesis

The masterthesis credits 30 ECTS-CP.

Module Title: Masterthesis

Module ID/Code: M-401 [8900]

1. Content and intended learning outcomes

Learning content:	Independent work on a research project in the field of the research groups within a given time frame. Details are specified in the examination regulation and examination organization regulation (available only in German).

Learning outcomes

After a successful completion of the course, the students…
- can work independently and efficiently.
- know how to handle feedback from supervisors.
- can define a research question.
- can build a sound theoretical and methodological framework.
- can collect data in a systematic and verifiable manner.
- analyse data critically and correctly.
- can formulate sound conclusions based on a comprehensive discussion of the results.
- can write a comprehensive, consistent and concise thesis.
- The editing time is a minimum of two and a maximum of six months.

2. Prerequisites

obligatory	Registered in either ABS-330 or ENV-330 or MAC-330 or APO-330 depending on the research group of the supervisors and completed at least 60 CP
recommended	
Maximum number of students	

3. Study program allocation

Study program	Compulsory/ Elective	Semester
M.Sc. Agricultural and Food Economics	C	4.

4. Teaching and learning methodes

Type of course	Interval	Topic	Language of instruction	Group size	SWS	Workload [h]	
						Contact time	Self-study
Proj (blocked)	full-day block	Research project work	English	1	0,0	15,0	885,0

5. Course cycle	6. Workload [h]	7. Duration	8. Credits (ECTS)
WS/SS	900	1	30,0

9. Requirements for the rewarding of credits (ECTS)

Types of Assessment	Prerequisites for admission to the Assessment	Graded yes/no	Language (exam)	Weighting factor
Masterthesis [8900]		graded	English	

Academic Achievements

10. Module coordination

Module coordinator

All independent teaching staff

Teaching person

The teaching persons in the current semester can be found in basis:
https://basis.uni-bonn.de/

Institute/ Department

Agrar-, Forst- und Ernährungswissenschaften

11. Further information