Georg-August-Universität
Göttingen

Directory of Modules

für den Promotionsstudiengang für Agrarwissenschaften (PAG) - zu der Promotionsordnung für die Graduiertenschule Forst- und Agrarwissenschaften (GFA) (Amtliche Mitteilungen I Nr. 47/2015, S. 1402, zuletzt geändert durch Amtliche Mitteilungen I Nr. 8/2022 S. 118)

Modules

Index by areas of study

I. Module directory for the PhD program PAG

Im Rahmen des Promotionsstudiums müssen Leistungen im Umfang von insgesamt wenigstens 20 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden. Doktorandinnen und Doktoranden müssen eines der programmgebundenen Curricula wählen; die Teilnahme am Curriculum des Promotionskollegs "Agrarökonomik" oder des Research Training Groups "Sustainable Food Systems" erfordert eine besondere Zulassung nach den Bestimmungen des jeweiligen Promotionsprogramms.

Within the field of the PhD studies at least 20 C must be succesfully completed according to the following regulations. PhD students have to choose one of the program-bound curricula; the participation in the curricula "Agricultural Economics" or "Sustainable Food Systems" requires a specific admission according to the respective PhD-program.

1. PhD program for Agricultural Sciences in Goettingen

Es müssen Module im Umfang von insgesamt wenigstens 24 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

At least 24 C must be successfully completed according to the following regulations.

a. Professional studies

Es müssen Module im Umfang von insgesamt wenigstens 12 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

At least 12 C must be successfully completed according to the following regulations.

aa. Kolloquien / Colloquia

Es muss eines der folgenden Wahlpflichtmodule im Umfang von 6 C erfolgreich absolviert werden:

One of the following mandatory modules worth at least 6 C must be successfully completed:

bb. Methods

Es sind Module im Umfang von mindestens 6 C erfolgreich zu absolvieren.

One of the following mandatory modules worth at least 6 C must be successfully completed:

b. Key competencies

Es müssen Module im Umfang von insgesamt wenigstens 12 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden:

At least 12 C must be successfully completed according to the following regulations

aa. Kompetenzentwicklung / Skills development

Es müssen mindestens Module im Umfang von 6 C erfolgreich absolviert werden. Promotionsmodule aus dem Bereich "Fachwissen und Methoden", sowie Module aus dem Angebot der GFA im Bereich Schlüsselkompetenzen sind ebenfalls zulässig

At least 6 C must be successfully completed. Alternatively, modules from “Methods and professional knowledge” (a.b) as well as other key competence modules offered by the GFA can be chosen.

bb. Wissenschaftliches Schreiben und Präsentieren / Scientific writing and presentation

Es muss eines der folgenden Wahlpflichtmodule im Umfang von 6 C erfolgreich absolviert werden. Nach Anmeldung für das Modul ist die Anmeldung für ein weiteres der nachfolgenden Module erst zulässig, sofern das zunächst belegte Modul endgültig nicht bestanden wurde oder als nicht bestanden gilt.

One out of the following modules amounting to 6 credits must be fulfilled successfully. After having been registered for the chosen module a registration for another module is not allowed until the candidate has definitively failed the first chosen module or the examination in this module has been counted “failed”.

2. Postgraduate Research Group Agricultural Economics

Es müssen Leistungen im Umfang von insgesamt wenigstens 30 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich erbracht werden. Für Module, die an beteiligten Partnerhochschulen absolviert werden, gelten die dort jeweils gültigen prüfungsrechtlichen Bestimmungen.

At least 30 C must be successfully completed according to the following regulations.

a. Professional studies

Es müssen Module im Umfang von insgesamt wenigstens 24 C nach Maßgabe der nachfolgenden Bestimmungen erfolgreich absolviert werden.

At least 24 C must be successfully completed according to the following regulations.

aa. Methodical-theoretical courses

Es müssen Module im Umfang von insgesamt wenigstens 18 C erfolgreich absolviert werden, die dem nachfolgenden Angebot oder dem Angebot der beteiligten Partnerhochschulen entnommen werden können. Aus den Bereichen "Theorie" und "Empirie" sind Angebote im Umfang von jeweils (mindestens) 6 C zu wählen.

Modules with overall at least 18 C out of the following offer (of which at least one module with at least 6 C from "Theory" and at least one module with at least 6 C from "Empirical Methods" must be successfully completed) or from a partner university must be successfully completed.

i. Theorie (T) / Economic Theory (T)

Aus dem Bereich "Theorie" sind Angebote im Umfang von (mindestens) 6 C zu wählen.

At least 6 C must be succesfully completed from the field "Economic Theory".

P.AG.0075: Consumer economics: theory and application for valuing Non-Market goods (6 C, 3 SWS).....15134

P.PA.T2200: Advanced Supply Chain Management (6 C, 2 SWS).....15160

ii. Empiricism (E)

Aus dem Bereich "Empirie" sind Angebote im Umfang von (mindestens) 6 C zu wählen.

At least 6 C must be successfully completed from the field "Empirical Methods".

P.AG.0074: Empirical research methods in agribusiness (6 C, 3 SWS)..... 15133

P.PA.E0200: Efficiency and productivity analysis 2- Stochastic Approaches (3 C, 2 SWS).....15157

P.PA.E0300: Time series analysis: Applications in agricultural and food economics (3 C, 2 SWS).....15158

iii. Focus areas (S)

Aus dem Bereich „Schwerpunktthema“ sind Angebote im Umfang von (mindestens) 6 C zu wählen. Alternativ können weitere Module aus dem Bereich Theorie (T) oder Empirie (E) gewählt werden.

Within the Focus areas (S) modules worth overall at least 6 C must be successfully completed. Alternatively, other modules from the fields "Economic Theory (T)" and/or "Empirical Methods (E)" can be chosen.

bb. Colloquia

Aus dem Bereich „Kolloquia“ sind Angebote von (mindestens) 6 C zu wählen. Weitere Module des Bereichs „Kolloquia“ können dem fächerübergreifenden Lehrangebot der beteiligten

b. Soft Skills / Key competencies

Es sind wenigstens 6 C aus folgendem Modulangebot zu absolvieren. Weitere Module des Bereichs „Soft Skills“ können dem Lehrangebot der beteiligten Partneruniversitäten entnommen und im Einzelverfahren durch den Graduiertenausschuss anerkannt werden.

At least 6 C must be succesfully completed according to the following regulations. Further modules from the the field "Key competencies" can be chosen from the involved universities and must be accepted by the graduate committee

3. RTG 2654 Sustainable Food Systems

Doktorandinnen und Doktoranden, die im Rahmen des RTG 2654 Sustainable Food Systems promovieren, müssen Module im Umfang von insgesamt wenigstens 30 C nach Maßgabe der folgenden Bestimmungen erfolgreich absolvieren.

At least 30 C must be successfully completed according to the following regulations.

a. Compulsory courses

Es müssen folgende Module im Umfang von insgesamt 21 C erfolgreich absolviert werden:

At least 21 C must be successfully completed:

b. Elective courses

Es müssen Module im Umfang von insgesamt 6 C erfolgreich absolviert werden.

At least 6 C must be successfully completed.

c. Professional skills courses

Es muss das folgende Modul im Umfang von 3 C nach Maßgabe der dort genannten Bestimmungen erfolgreich absolviert werden.

At least 3 C must be successfully completed according to the following regulations.

Georg-August-Universität Göttingen **Module P.AG.0001: PhD Colloquium plants and soils in agriculture**	6 C 3 WLH

Learning outcome, core skills: PhD students practice the scientific presentation of their work. They learn to discuss results and critically reflect on their own work as well as that of their fellow student. Moreover PhD students expand their knowledge of current research in the field of Crop Sciences.	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: PhD Colloquium plants and soils in agriculture (Seminar) *Contents*: Research projects, current status and results of theses in the Agropedology, Grassland Science , Crop Production , Plant Nutrition and Quality Plant-Based Products fields are presented and discussed.	3 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one’s own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Johannes Isselstein
Course frequency: each winter semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module P.AG.0002: Carl Sprengel colloquium**	6 C 3 WLH

Learning outcome, core skills: Students acquire the competence to process and present research results. They will then defend their results in an interdisciplinary discussion.	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Carl Sprengel colloquium (Seminar) *Contents*: The colloquium is organized by external scientists and members of the participating institutes and departments. Students get an overview of current scientific topics in their own and neighboring disciplines. Within the colloquium, students present important results from their own research in a lecture followed by an interdisciplinary discussion (Evaluation seminar)	3 WLH
Examination: Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one’s own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Dr. Bernd Steingrobe
Course frequency: each winter semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 60	

Georg-August-Universität Göttingen **Module P.AG.0004: Ecology seminar**	6 C 3 WLH

Learning outcome, core skills: Students acquire the competence to process and present research results. They will then defend their results in an interdisciplinary discussion.	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Ecology Seminar (Seminar) *Contents*: The colloquium is organized by external scientists and members of the participating institutes and departments. Students get an overview of current scientific topics in their own and neighboring disciplines. Internationally renowned speakers present ecological themes from the fields of Conservation Biology, Plant Ecology, Animal Ecology, Agroecology, Landscape Ecology, and Global Change Biology. Within the colloquium, students present important results from their own research in a lecture followed by an interdisciplinary discussion (Evaluation seminar).	3 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one's own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Catrin Westphal
Course frequency: each semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 35	

Georg-August-Universität Göttingen **Module P.AG.0005: Colloquium animal sciences**	6 C 4 WLH

Learning outcome, core skills: Critical analysis of presented scientific data and derivation of new scientific questions. Presentation and discussion of scientific results to an academic audience.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Colloquium animal sciences (Seminar) *Contents*: Within this course, PhD students present the topics of their research from the general field of Livestock Sciences and leave them open for critical discussion.	4 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one's own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Dr. rer. agr. Sabrina Elsholz
Course frequency: each semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 35	

Georg-August-Universität Göttingen **Module P.AG.0008: Progress in plant breeding research**	6 C 3 WLH

Learning outcome, core skills: The PhD students learn, by the example of their own project, to present and critically discuss a scientific research project. They learn to present the progress of their work on the respective current scientific level and to critically assess the results, conclusions and relevance of their work to the area of research. Furthermore, PhD students learn to support other PhD students in the same process through active discussions.	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Progress in plant breeding research (Seminar) *Contents*: Current topics	3 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one's own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Christian Möllers
Course frequency: each winter semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0020: Scientific writing and publishing in crop sciences**	6 C 4 WLH

Learning outcome, core skills: The module is intended to provide skills and key competencies in the following areas: Structuring and writing of scientific texts in English, layout of graphics and tables, imaging of chemical structures and molecular sequences , literature search, citation, creating presentations in the form of posters and lectures, and reviewing of manuscripts by other authors. The PhD students become familiar with the procedures of the publication process from writing and submission of manuscripts up to peer review.	**Workload:** Attendance time: 40 h Self-study time: 140 h

Course: Scientific writing and publishing in crop sciences (Lecture, Exercise, Seminar) *Contents*: The course consists of a preparatory seminar with the following content focusing on: • Good scientific practice • What is a scientific paper? • Scientific publishing • Poster presentation • Writing grant proposals and submitting papers to journals • Reviewing a scientific manuscript • Communication skills Following these lectures, the PhD students write a publication for a scientific journal under individual guidance of their respective advisor. They also evaluate a separate manuscript written for publication by third parties.	4 WLH
Examination: Homework (max. 15 pages) **Examination requirements:** Drafting a manuscript for publication in a scientific journal; Review of an article	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Stefan Siebert
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0022: Scientific writing and presenting for PhD candidates**	6 C 4 WLH

Learning outcome, core skills: Participants will acquire knowledge mentioned in the ‘Learning Objectives’ section found below and can implement these in the context of practical exercises based on their edited PhD thesis topics.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Scientific writting and presenting for PhD candidates (Exercise, Seminar) *Contents*: Writing scientific essays and monographs, design of tables and graphs, proper citations, creating presentations, structuring and rhetorical design of lectures.	4 WLH
Examination: Presentation (approx. 20 minutes, 50%) und homework (max. 30 pages, 50%) **Examination requirements:** Intensive knowledge and successful implementation of teaching the content of scientific articles and monographs, graphic and table design, presentation and lecture design. Presentation of a rated seminar report (in terms of content Summary and formal review) for an attended seminar preparation, a PowerPoint presentation and holding a lecture. Creation of a scientific publication.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Wolfgang Siegert
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0023: Competence in reseach integrity**	2 C (incl. key comp.: 2 C) 1 WLH

Learning outcome, core skills: Participants will be enabled, according to the guidelines of good scientific practice, to conduct research. They have understood the basic principles of science (trust, honesty, transparency, etc.) and from them they are aware of the growing responsibility to follow them. They are aware of areas of conflict and can apply strategies to avoid and / or resolve conflicts.	**Workload:** Attendance time: 10 h Self-study time: 50 h

Course: Competence in reseach integrity (Seminar) *Contents*: Standards of good scientific practice in the areas of data management, data presentation, scientific publishing, authorship and self-responsible scientific work.	1 WLH
Examination: Oral Presentation (approx. 20 minutes) **Examination requirements:** Active participation, reviewing, presentation and discussion of a case study in the group. Contentwise, topics covered will include datamanagement, data presentation, authorship, supporting committees as well as conflict behavior.	2 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** PD Dr. Martin Potthoff
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 20	

Additional notes and regulations:
PhD Students are not allowed to chose the module P.Forst.113 if they have already chosen P.AG.0023.

Georg-August-Universität Göttingen **Module P.AG.0024: Advanced skills for selecting, reviewing and understanding scientific articles**	3 C 2 WLH

Learning outcome, core skills: Students will learn the necessary skills to select, understand and review scientific publications, as well as to critically evaluate and summarise in writing the methods, techniques and results presented within. These are essential skills necessary for scientific research and the scientific writing of publications.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Advanced skills for selecting, reviewing and understanding scientific articles (Lecture, Exercise) *Contents*: Overview of researching and finding relevant articles, methods utilised for evaluating techniques and results, and the analysis and assessment if suitability of articles for reference purposes. In addition, the writing of English texts will be practiced, using some examples and writing exercises	2 WLH
Examination: Presentation (approx. 60 minutes, 40%) and written report (max. 10 pages, 60%) **Examination requirements:** By applying the skills acquired in the lectures, the students will be required to select a relevant subject area, select a number of journal articles and describe, analyse and evaluate the information. The written report should include a brief summary and critical evaluation of each paper referenced, followed by a short review of the selected subject area.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Alexander Mott
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module P.AG.0042: Bioanalytical techniques in environmental and plant sciences**	6 C 4 WLH

Learning outcome, core skills: The students learn and understand the physico - chemical principles and the areas of application of the presented methods. They are able to practically apply the following methods in the laboratory. 1. Mass spectrometry and ionization techniques 2. Chromatographic and electrophoretic methods for the separation and Analysis of peptides and proteins 3. Biophotonic 4. Immunochemical methods 5. Molecular genetic detection methods	**Workload:** Attendance time: 60 h Self-study time: 120 h

Course: Bioanalytical techniques in environmental and plant sciences (Lecture, Exercise) *Contents*: In many areas of environmental and life sciences, profound knowledge of modern, analytical methods is of fundamental importance. This module focuses on molecular techniques. The theoretical principles that will be tought in this Module are to be supported by the selection and implementation of suitable analytic techniques. In the laboratory, the methods are applied on a practical level.	4 WLH
Examination: Oral examination (approx. 25 minutes) **Examination prerequisites:** Regular participation **Examination requirements:** Very good practical knowledge of mass spectrometry and ionization techniques, chromatographic and electrophoretic methods for the separation and analysis of peptides and proteins, biophotonics, immunochemical methods and molecular genetic verification proceedures. The oral examination encompasses the entire material covered during the semester.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Jens Carsten Niemeyer
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module P.AG.0043: Efficiency and productivity analysis: stochastic approaches**	6 C 3 WLH

Learning outcome, core skills: Students acquire the necessary methods to independently design and implement econometrically-based efficiency and productivity analyses. Students learn how to use various software packages that can be applied in this field. They are able to test both the empirical results as well as economic implications. They understand how to present results, tests and policy implications suitable to the subject in a written or oral fashion	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Efficiency and productivity analysis: stochastic approaches (Lecture, Exercise) *Contents*: This module focuses on econometric methods to increase the efficiency and productivity analysis of companies in the agri-food sector. Particular attention is paid to the explanation of the differences in the values ofefficiency.	3 WLH
Examination: Oral (approx. 30 minutes, 50%) and project work (max. 12 pages, 50%) **Examination requirements:** Profound knowledge of econometric foundations of stochastic frontier anlysis (SFA) ; maximum likelihood estimation: asymptotics, tests, numerical specificities; models with composite error terms; estimate of the production frontier and efficiency of the individual; expansion of behavior-based approaches (cost, profit function); distance functions; productivity breakdown.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Bernhard Brümmer
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0044: Molecular genetics: fundamental techniques in plant pathology and entomology**	6 C 4 WLH

Learning outcome, core skills: The participants will learn basic and advanced techniques of DNA analysis and manipulation, which are used in phytopathology.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Molecular genetics: fundamental techniques in plant pathology and entomology (Internship, Lecture) *Contents*: The module is to provide PhD students in the field of Phytomedicine with the tools for the implementation of molecular biological studies. To achieve this, the following techniques will be discussed theoretically and the following concrete experiments will be conducted: Isolation of nucleic acids (total DNA , plasmids, DNA fragments from gels), plasmid amplification by transformation by E. coli, restriction analysis, DNATyping, southern hybridization using not radiaktiver markings, real - time PCR for the diagnosis of cereal pathogens, DNA cloning.	4 WLH
Examination: Term Paper (max. 10 pages) **Examination requirements:** Very good knowledge of the fundamental and advanced techniques of DNA analysis and manipulation that are being used in phytopathology. A protocol is to be prepared for laboratory experiments and their analyses documenting the success of the conducted experiments and the underlying concepts.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Birger Koopmann
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module P.AG.0045: New methods and developments in animal sciences**	6 C 4 WLH

Learning outcome, core skills: Students will learn the latest methods and techniques mentioned in the 'Teaching Content' section found below. They are able to apply and implement this theoretical, science-based knowledge in practical exercises. Potential problems are to be detected and solutions for them independently developed and presented	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: New methodes and developments in animal sciences (Lecture, Exercise) *Contents*: Learning and application of the latest methods and techniques from the field of Animal Sciences: 1. Advanced methods of breeding and statistical genetics (12 h) 2. Advanced methods of animal nutrition and feed science (12 h) 3. Theoretical and practical behavioral observations and their specific evaluation methods (12 h) 4. Methods for the assessment of production systems (6 h) 5. Specific breeding techniques for fish (4 h) 6. Ultrasound applications in animal breeding (4 h) 7. Carcass classification and meat quality regulations (6h)	4 WLH
Examination: Referat (ca. 30 Minuten, 50%) mit schriftlicher Ausarbeitung (max. 10 Seiten, 50%) **Examination prerequisites:** Participation in the exercises **Examination requirements:** Very good knowledge and ability to apply new methods of animal husbandry, population genetics, animal nutrition, ethology and their specific evaluation methods, evaluation of production systems, specific breeding techniques for fish, the ultrasonic applications in animal breeding and carcass classification and meat quality regulations.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. rer. agr. Sabrina Elsholz
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0046: Methods for quality assessment**	6 C 4 WLH

Learning outcome, core skills: The PhD students learn further analytical methods as well as their theoretical basics which go beyond the range of their actual research. They develop the ability to evaluate the achieved results in broader scientific context. In addition, they further improve their ability to work in a team, mutually discuss information, and share problems and solutions.	**Workload:** Attendance time: 40 h Self-study time: 140 h

Course: Methods for quality assessment (Block course, Exercise) *Contents*: The module is to teach PhD students methods of quality analysis of plant-based materials and products. It is to teach theoretical and experimental basics. Examples of methods : • Compositional analysis by HPLC • thermal properties of starches • Titration • Enzyme kinetics • Sensory of selected foods • Mass spectrometry	WLH
Examination: Projektarbeit (max. 20 Seiten) **Examination prerequisites:** Participation in experimental lab work is mandatory. **Examination requirements:** Complete mastery of theoretical and instrumental fundamentals of methods for analysis of plant products and quality assessment. Scientific analysis of the data obtained by means of statistical methods. A given presentation of the results in comparison with findings in literature.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Susanne Neugart
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 3	

Georg-August-Universität Göttingen **Module P.AG.0047: Linear statistical models with R**	6 C 3 WLH

Learning outcome, core skills: The students learn state-of-the-art methods of statistical data analysis. This is a key competence that is often asked for in job applications.	**Workload:** Attendance time: 30 h Self-study time: 150 h

Course: Linear statistical models with R (Lecture) *Contents*: Introduction to linear statistical models; introduction to the software package „R". The following topics are covered: Experimental design, hypothesis tests, variable types; general linear models (regression, analysis of variance and covariance); generalized linear models; generalized linear mixed models; model selection and information theory.	3 WLH
Examination: Term Paper (max. 20 pages) **Examination prerequisites:** Succeed in all written homework **Examination requirements:** Written thesis on one of the topics described above. Each student has to prove that he/she is able to analyze a given complex dataset on his/her own. The thesis will have to be written in English language. It is also possible to analyze an example dataset from the student´s dissertation thesis.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Catrin Westphal
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 10	

Georg-August-Universität Göttingen **Module P.AG.0060: Advanced methods in animal breeding and statistical genetics**	6 C 4 WLH

Learning outcome, core skills: Participants will gain detailed knowledge of the methods mentioned in the ‘Learning Objectives’ section found below and are able to apply these with appropriate methods (e.g. computer programmes) with simulated and real data.	**Workload:** Attendance time: 60 h Self-study time: 120 h

Course: Advanced methods in animal breeding and statistical genetics (Lecture, Exercise, Seminar) *Contents*: Knowledge of current methodological developments in the field of quantitative-genetic animal breeding and of statistical genetics, including the areas parameter and breeding value estimation in linear and non-linear models, design of breeding plans, description and management of genetic diversity within and between populations, statistical methods of genome analysis, haplotyping linkage mapping and association analyses, population genomics	4 WLH
Examination: Presentation (approx. 30 minutes, 50%) and homework (max. 20 pages, 50%) **Examination requirements:** Very good knowledge of the methodological aspects of their own projects. Participants present the methodological aspects of their own projects as part of an in-depth, compulsory seminar including the methodological principles and also submitting the methodological description in writing. The participants complete module-accompanying graded exercises.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** N. N.
Course frequency: each semester	**Duration:** 2 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0061: Advanced methods and developments in livestock and bio-engineering**	6 C 4 WLH

Learning outcome, core skills: Fundamentals of physics and biology, animal sciences, applied, mathematics, fundamentals of agricultural engineering, basic engineering processes (Mixing, separation, heating, cooling, etc.).	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Advanced methods and developments in livestock and bio-engineering (Lecture, Excursion, Seminar) *Contents*: 1. Process modeling in the following areas of application : 2. Emergence and spread of gaseous and particulate emissions, nitrification and denitrification in nitrogen-containing aqueous media, management and control of air climatic systems. 3. Neural Networks and Fuzzy Logic models and their application in the context of Precision Livestock Farming. 4. Radio Frequency Identification (RFID) in production processes of livestock.	4 WLH
Examination: Presentation (approx. 20 minutes, 50%) and oral (approx. 30 minutes, 50%) **Examination requirements:** In-depth knowledge in the areas of emissions , use of air-climatic systems, neural networks and the use of RFID technology in livestock.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Herman Van den Weghe
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0062: Bacteriology**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
Students will be able independently identify phytopathogenic bacteria, based on symptomatology, by detecting important phenotypic, physiologischbiochemischer features and using modern serological tests. Experimental work will be carried out in groups and the results obtained presented to the entire group and discussed in detail.	Attendance time: 56 h Self-study time: 124 h

Course: Bacteriology (Internship, Lecture) *Contents*: Demonstration of key bacterial diseases in inoculated plants and description of typical features for their diagnosis; general handling phytopathogenic bacteria, isolation methods, cultivation, characterization and identification of phytopathogenic bacteria; inokulationstechniken, physiological typing of phytopathogenic bacteria, using different serological detection methods, resistance testing to bacteria.	4 WLH
Examination: Oral examination (approx. 20 minutes) **Examination prerequisites:** Group protocol and result presentation **Examination requirements:** Very good knowledge of the taxonomy of phytopathogenic bacteria, detection of important bacterial diseases, control of isolation and cultivation techniques of bacterial pathogens. Identification of bacteria on the basis of phenotypic, physiological/ biochemical characteristics. Knowledge of serological detection methods. Possibilities of controlling phytopathogenic bacteria.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Dr. Athanassios Mavridis
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module P.AG.0064: Genome analysis in livestock**	6 C 4 WLH

Learning outcome, core skills: Within different projects students will be familarized with molecular biological techniques including gene isolation and sequencing as well as functional gene analysis. In the course of the project work students will achieve a highly independent experimental level.	**Workload:** Attendance time: 60 h Self-study time: 120 h

Course: Genome analysis in livestock (Exercise) *Contents*: Learning of standard molecular biological techniques (RNA, DNA isolation, DNA-sequencing, construction of DNA libraries, electrophoresis, cloning), use of molecular biological techniques in genetic analysis.	4 WLH
Examination: Project work (max. 30 pages) **Examination requirements:** Profound knowledge of standard molecular biology techniques (RNA, DNA isolation, DNA - sequencing, construction of DNA libraries, electrophoresis, cloning) and the use of molecular biology techniques for genetic analysis. Preparation of a project-based scientific manuscript	6 C

Admission requirements: none	**Recommended previous knowledge:** Knowledge of molecular biology and biotechnology in livestock sciences.
Language: German, English	**Person responsible for module:** Prof. Dr. Dr. Bertram Brenig
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 4	

Georg-August-Universität Göttingen **Module P.AG.0065: Market integration and price transmission**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
PhD students have read relevent journal articles about market integration and price transmission. They understand the methods and results described in these articles. They are able to identify unresolved questions and research needs in this subject area. They are able to plan and perform appropriate research projects. They can discuss the acquired knowledge in this specialization with colleagues, and present before an academic audience.	Attendance time: 60 h Self-study time: 120 h

Course: Market integration and price transmission (Lecture, Exercise) *Contents*: Theory and measurement of the integration of agricultural markets - Reading course foradvanced students.	4 WLH
Examination: Presentation (approx. 20 minutes, 75%) and oral (approx. 20 minutes, 25%) **Examination requirements:** Good knowledge of the determinants of relationships between prices on spatially separated markets, between different prices for agricultural products and between prices at different stages of the food chain. Advanced econometric methods for the analysis of price transmission process (threshold and other non-linear cointegrations-models, Markov-switching-methods, parity bounds models).	6 C

Admission requirements:	**Recommended previous knowledge:**
none	none
Language: English	**Person responsible for module:** Prof. Dr. Stephan von Cramon-Taubadel
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0068: New areas in plant breeding**	6 C 5 WLH

Learning outcome, core skills:	**Workload:**
Learning targets: Understand new methodological approaches in plant breeding and judge and interpret selected results in actual breeding research. Students learn to discuss plant breeding topics professionally. Skills: PhD students learn to compile actual problems or an actual technology in the area of the applied genetics and plant breeding.	Attendance time: 60 h Self-study time: 120 h

Course: New areas in plant breeding (Excursion, Seminar) *Contents*: Seminar with field /greenhouse/lab visits *Contents*: Students will present a scientific manuscript to an audience comprised of Scientists, PhD students, and Masters students. Students will actively participate in the discussion of presentations given by other course presentations. In addition to presenting, students will participate in an excursion to the field/greenhouse/lab to observe and present ongoing research experiments. The topic of a student's seminar talk does not overlap with the topic of the student's dissertation.	5 WLH
Examination: Presentation of a scientific manuscript (20 minutes talk; discussion with no time limitation); topic must not overlap with one's own dissertation **Examination prerequisites:** Regular attendance **Examination requirements:** The students should be able to present and discuss scientific literature within the field of plant breeding, yet outside of their dissertation topics.	6 C

Admission requirements: none	**Recommended previous knowledge:** Basic understanding of genetics and plant breeding
Language: English	**Person responsible for module:** apl. Prof. Dr. Wolfgang Link
Course frequency: each winter semesterDuration: 2 semesters Per semester 20h attendance as seminar and 10h field/ greenhouse/lab visit	**Duration:** 2 semester[s]
Number of repeat examinations permitted: 99 times	**Recommended semester:**
Maximum number of students: 20	

Additional notes and regulations:
The PhD students of this module are invited to attend the Master's course "Journal Club: Evolutionary Genetics and Breeding; module number pending"; symmetrically, the Master students of that module are invited to attend this module (PAG 0068). This will allow the PhD students to give their formal presentation

as described above to a wider audience, hence will give them experience presenting, teaching, and discussing with an audience comprised of a diversity of scientific abilities.

Georg-August-Universität Göttingen **Module P.AG.0069: Crop production in Central Europe including upstream and downstream sectors**	6 C 6 WLH

Learning outcome, core skills: The module is to teach PhD students skills and key competencies in the following areas : • In-depth, direct experience of decision-making, as well as task and organization of political institutions, administration and economy in the context of social demands. • Case-specific, technical training of the participants, including follow-up topics by creating posters.	**Workload:** Attendance time: 80 h Self-study time: 100 h

Course: Crop production in Central Europe including upstream and downstream sectors (Excursion, Seminar) *Contents*: The course consists of preparatory seminars and field trips to companies, research institutes, associations and farms with the following thematic priorities: Getting to know: Plant production in the context of processes in • upstream area (breeding, plant protection, fertilizer, farm equipment) • downstream (food industry) or the entire plant production	6 WLH
Examination: Presentation (approx. 20 minutes) **Examination prerequisites:** Participation in seminars and excursions **Examination requirements:** Profound knowledge of plant production in the context of processes in upstream area (breeding, plant protection, fertilizer, farm equipment) and in downstream area (food industry). Independent analysis of case studies on the topic, including a presentation with preparation and follow-up.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Anne-Katrin Mahlein
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0070: Risk analysis and risk management in agriculture**	6 C 5 WLH

Learning outcome, core skills:	**Workload:**
Students will acquire the methodological tools for measuring, analyzing and managing risks in agricultural business. They are able to identify individual problems and apply appropriate techniques to solve them. They acquire methodological competences that enable the students to conduct their own research.	Attendance time: 64 h Self-study time: 116 h

Course: Risk analysis and risk management in agriculture (Lecture, Exercise) *Contents*: The focus of this module is risk measurement, risk analysis and risk management. The course contents include : • Distributions and stochastic processes • Value-at-risk concept • Risk-programming approaches • Insurance • Valuation of derivatives including real options and weather derivatives.	5 WLH
Examination: Project work (4 x 90 minutes) **Examination requirements:** Very good knowledge of statistical concepts, damage and index-related insurance, dynamic programming and the option pricing theory.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Oliver Mußhoff
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0071: Value-added chain and healthy nutrition**	6 C 4 WLH

Learning outcome, core skills: The connections or feedback mechanisms that exist and how social demands are implemented. are to be taught in this course.	**Workload:** Attendance time: 60 h Self-study time: 120 h

Course: Methods for quality assessment (Lecture, Exercise) *Contents*: The module addresses the interlinking relationships of elements within the value chain in terms of representing and evaluating a healthy diet. The module includes introductory lectures, case studies, project work and excursions .	WLH
Examination: Vortrag (ca. 20 Minuten, 50%); Hausarbeit (max. 15 Seiten, 50%) **Examination requirements:** About the areas in the value chain, such as crop production, including selected upstream and downstream areas of the food industry (first and second processing stage), trade (wholesale and retail , including consulting and Marketing) and the consumer (dietary habits and health aspects) have very good knowledge shall be demonstrated	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Susanne Neugart
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 12	

Georg-August-Universität Göttingen **Module P.AG.0072: Topics in rural development economics II**	6 C 4 WLH

Learning outcome, core skills: The doctoral students gain a deeper understanding of relevant topics of rural development economics. They learn to critically evaluate scientific articles and to highlight and present the important aspects of a scientific article. Based on critical reading of the scientific articles, they also gather experience on how to structure articles and how to formulate concise statements. Moreover, PhD students learn how to write a scientific referee report. Course participants are thus introduced to different aspects of scientific writing and publishing.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Topics in rural development rconomics II (Lecture) *Contents*: This course provides PhD Students with an overview of relevant topics in rural development economics. The module is structured as a reading course, building on selected articles from relevant international journals. Students are required to read announced articles before the classroom sessions, in order to enable a critical debate in class. The course also teaches students on how to write a scientific referee report. PhD students are required to present one of the articles in class and to write a referee report for a scientific paper. The articles selected for the course are clustered around key topics relevant to rural development economics, such as listed below: • The food system transformation and smallholder farmers; • Rural livelihood strategies and income diversification; • Adoption and impacts of modern agricultural technology; • Economics of nutrition and health; • Gender and intra - household resource allocation.	4 WLH
Examination: Presentation (approx. 30 minutes, 50%) and homework (max. 3 pages, 50%) **Examination requirements:** In-depth knowledge on relevant topics of rural development economics. Ability to highlight and critically reflect the important aspects of a scientific article. Preparing a referee report for a scientific paper.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Meike Wollni
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0074: Empirical research methods in agribusiness**	6 C 3 WLH

Learning outcome, core skills: In particular, knowledge on techniques such as preference research (especially discrete-choice-analysis), regression and causality analysis (especially PLS) will be deepened. Prerequisite to taking the course is a basic understanding of empirical social research and statictics.	**Workload:** Attendance time: 44 h Self-study time: 136 h

Course: Empirical research methods in agribusiness (Lecture, Exercise) *Contents*: The module is geared towards doctoral students who conduct an empirical study for their PhD thesis. It contains an overview over available secondary statistics, the steps of method selection, the specific advantages and disadvantages of qualitative and quantitative methods, interviewing techniques, as well as uni-, bi- and multivariate procedures of data analysis.	3 WLH
Examination: Term Paper (max. 20 pages) **Examination requirements:** Deepened knowledge of study design and statistical evaluation procedures	6 C

Admission requirements: Introduction in empirical social sciences; Basic knowledge in statistics and econometrics; Basic knowledge in statistical programmes (SPSS, Stata, R, etc.)	**Recommended previous knowledge:** none
Language: German	**Person responsible for module:** Prof. Dr. Achim Spiller
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0075: Consumer economics: theory and application for valuing Non-Market goods**	6 C 3 WLH

Learning outcome, core skills: The students learn the theories and applications for the valuation of non-market goods.	**Workload:** Attendance time: 40 h Self-study time: 140 h

Course: Consumer economics: theory and application for valuing Non-Market goods I (Lecture, Exercise, Seminar) *Contents*: The methods for valuing non-market good (e.g. health and security systems, climate, clean water and the conservation of habitats) are employed, among other fields, in agricultural and environmental economics. The course will enable students to obtain a fundamental understanding of the theory of non-market goods. They will learn how to use the most important econometric techniques for the application. The course consists of three parts: 1. Introduction to the theory; 2. Introduction to econometric foundations and 3. Practical application of real data.	3 WLH
Examination: Presentation (approx. 75 minutes, 50%) and homework (max. 20 pages, 50%) **Examination requirements:** Theoretical knowledge (measurement of welfare changes, structure of preference, non-use values and values under uncertainty), methods (contingent valuation methods, choice experiments, experimental auction, heterogeneities in non-market evaluations and hedonic techniques) and their application.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Xiaohua Yu
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.AG.0076: Soil biogeochemistry**	6 C 3 WLH

Learning outcome, core skills: The students obtain the competence to process research findings, present them and defend them in an interdisciplinary discussion.	**Workload:** Attendance time: 48 h Self-study time: 132 h

Course: Soil biogeochemistry (Seminar) *Contents*: The seminar will be held by external scientists and members of both soil science departments. The students receive an overview over current scientific topics of their own and neighboring disciplines. During the course of the seminar, the students present important findings from their own research project in a presentation followed by an interdisciplinary discussion (evaluation seminar).	3 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination requirements:** Very good knowledge of one's own field of research.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Iakov Kuzyakov
Course frequency: each semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 40	

Georg-August-Universität Göttingen **Module P.AG.0077: Isotopes in ecosystem sciences**	6 C 3 WLH

Learning outcome, core skills: The students obtain the competence to use different isotope methods in their research.	**Workload:** Attendance time: 48 h Self-study time: 132 h

Course: Isotopes in ecosystem sciences (Lecture, Seminar) *Contents*: The course is geared towards younger scientists who apply or want to apply different tracer methods and isotopes in their experiments. Topics: • introduction to isotopic geochemistry, tracer methods • stable and radioactive isotopes; analytical methods • security and particular characteristics of working with radioactive isotopes • applications in process research • carbon cycle and humus research • interactions soil – plant, rhizosphere • nutrient uptake through the plant • incubation studies on soil respiration and degradation of plant remains and pesticides in the soil • radiocarbon dating, other dating methods • migration / translocation studies • erosion estimation • autoradiography and imaging for allocation studies • sorption and exchange studies • paleo-reconstruction • analyzing results, artifacts and errors, detection limits • coupling of tracer methods and biomarkers	3 WLH
Examination: Presentation (approx. 20 minutes, 50%) and written examination (30 minutes, 50%) **Examination prerequisites:** Participation in lectures and seminars **Examination requirements:** Very good knowledge of isotope applications in ecosystem research	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Iakov Kuzyakov
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted:	**Recommended semester:**

once	
Maximum number of students: 40	

Georg-August-Universität Göttingen **Module P.AG.0082: Colloquium Progress in Plant Nutrition**	6 C 2 WLH

Learning outcome, core skills: Introduction and advancement in independent scientific work: • Presentation and discussion of recent research results • Integration of own results to state of the art • Discussion with specialized audience • Deduction of further research questions based on own results and findings of neighbouring research projects	**Workload:** Attendance time: 48 h Self-study time: 132 h

Course: Colloquium Progress in Plant Nutrition *Contents*: Students hold lectures in the Department of Crop Science, research staff of IAPN and other institutions. PhD students gain a general overview of the current scientific questions in plant nutrition research and related disciplines such as crop physiology, crop science, plant protection, soil hydrology and others.	
Examination: 2 Presentations (à approx. 30 minutes, 60%) with written outline (à max. 10 pages, 40%) **Examination prerequisites:** Participation in 18 colloquia **Examination requirements:** Profound knowledge in the own research fiel**.**	6 C

Admission requirements: none	**Recommended previous knowledge:** According to the subject
Language: German, English	**Person responsible for module:** Prof. Dr. Klaus Dittert
Course frequency: each semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:** 1 - 6
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0083: Colloquium Sugar beet Research**	6 C 3 WLH

Learning outcome, core skills: Guidance to independent scientific work: • Presentation of research results • Integration of own results to state of the art • Discussion with specialized audience • Deducation further research questions	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Colloquium Sugar beet Research *Contents*: Lectures hold by PhD students of the Department of Crop Science, research staff of the IfZ and other institutions. PhD students obtain a general overview of the current scientific questions in sugar beet research and related fields as there are crop science, crop nutrition, physiology, plant protection and others. Die Studierenden bekommen einen Überblick über aktuelle Forschungsthemen der Zuckerrübenforschung und angrenzender Gebiete in den Bereichen Pflanzenbau, Pflanzenernährung, Physiologie, Phytomedizin und weiteren.	3 WLH
Examination: 3 Progress reports (Lecture of 15 minutes, one-page handout), not graded **Examination prerequisites:** Participation of 18 colloquia **Examination requirements:** Profound knowledge of the own research field	6 C

Admission requirements: none	**Recommended previous knowledge:** According to the subject
Language: German, English	**Person responsible for module:** PD Dr. Anne-Katrin Mahlein
Course frequency: each winter semester	**Duration:** 3 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0084: Soil geographical and agroecological field studies**	9 C 6 WLH

Learning outcome, core skills: Fachbezogene Kenntnisse der Bodenbildung und –nutzung, Ökosystemare Zusammenhänge, Biogeochemische Kreisläufe.	**Workload:** Attendance time: 192 h Self-study time: 78 h

Course: Bodengeographische und Agrarökologische Feldübungen (Exercise, Seminar) *Contents*: Die Lehrveranstaltung soll einen Querschnitt durch mehrere Klimazonen aufzeigen: Besonderheiten der Bodenbildung und -nutzung, sowie Landwirtschaft werden in Zusammenhang mit Klima, Vegetation, Geomorphologie, Nährstoff- und Wasserkreisläufen im Ökosystem und Landschaft erläutert. Typische Böden unveränderter, natürlicher Ökosysteme werden selbstständig im Gelände prozessorientiert beschrieben und mit ackerbaulich genutzten Böden verglichen. Rückschlüsse auf die Änderung des Prozessgefüges in Böden durch ackerbauliche Nutzung sollen durch die Doktoranden betreut von den Studenten erarbeitet werden. Großversuche zur Landschafts- und Agrarraumgestaltung, Biosphärenreservate und Naturschutzgebiete sowie und landwirtschaftliche Betriebe verschiedener Betriebsstrukturen werden besichtigt.	9 WLH
Examination: Präsentation (2x ca. 30 Minuten) (Gewichtung 50%) und Hausarbeit (max. 20 Seiten) (Gewichtung 50%) **Examination requirements:** Vorbereitendes Seminar: Pedogeneseprozesse und biogeochemische Stoffkreisläufe entlang des Klimagradienten temperierte Ökosysteme sollen vor dem Hintergrund aktueller biogeochemischer Forschung vorgestellt werden. Um erste Einblicke in Lehrtätigkeit am Interface zur Forschung zu erhalten, sollen die Doktoranden dann im Feld die aktuellen Forschungsthemen mit Master- und Bachelorstudenten in kleinen Gruppen unter Anleitung der Lehrbeauftragten diskutieren. Die aktuellen Themen und Fragestellungen, die sich im Rahmen dieser Diskussionsrunde ergeben, sollen dann im Nachbereitungs-Seminar anhand innovativer, aktueller Prozessstudien ausgeführt und vertieft werden. Über diesen Themenkomplex, sowie die wissenschaftliche Diskussionsrunde mit den MSc und BSc-Studenten im Feld soll dann eine bis zu 20seitige Hausarbeit verfasst werden, die das Thema in der nötigen wissenschaftlichen Tiefe darstellt.	9 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: German, English	**Person responsible for module:** Prof. Dr. Iakov Kuzyakov
Course frequency:	**Duration:**

each summer semester	1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0085: Computing in Science - Basics of Computational Biology**	3 C 2 WLH

Learning outcome, core skills: Students will learn the basics in working with linux operating systems and shell scripting. The scripting language python will be used to introduce the student to the analysis of biological high troughput data.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Computing in Science - Basics of Computational Biology (Lecture, Exercise) *Contents*: Usage of the Linux command line and automatisation of processes with shell scripts. Analysis of large data sets from high throughput methods like Next Generation Sequencing using the scripting language python and published command line tools.	2 WLH
Examination: Term Paper (max. 20 pages) **Examination requirements:** By applying the aquired skills in linux and scripting, students are required to analze a data set from a hight troughput experiment. The written report should include all the commands and scripts used for the analysis as well as a short written summary.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Clemens Falker-Gieske
Course frequency: each semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0087: Advanced Theories of Consumer Research**	6 C 4 WLH

Learning outcome, core skills: Die Promovierenden erhalten einen Überblick über fortgeschrittene Theorien des Konsumentenverhaltens und entwickeln ein Verständnis für grundlegenden Fragestellungen und neuere Fachentwicklungen. Dies befähigt sie, in ihren Promotionen fundierte Hypothesen und Untersuchungsmodelle zu entwickeln.	**Workload:** Attendance time: 56 h Self-study time: 124 h

Course: Fortgeschrittene Theorien der Konsumforschung (Lecture, Seminar) *Contents*: • Konsumforschung als interdisziplinäres Forschungsgebiet • Fachtraditionen • Ökonomische Zugänge • (Sozial-)Psychologische Zugänge • Soziologische Zugänge • Kulturwissenschaftliche Zugänge • Physiologische Zugänge • Ansätze des Neuromarketings • Modellierung des Konsumverhaltens • Neue empirische Ansätze • Anwendungen: Marketing, Verbraucherschutz und Ernährungspolitik *Course frequency:* each winter semester	4 WLH
Examination: Oral Presentation (approx. 30 minutes), not graded **Examination prerequisites:** Anwesenheitspflicht im Seminar **Examination requirements:** Präsentation eines ca. 30-minütigen Forschungsvortrags zu einer der vorgestellten Theorien bzw. Theoriekonstrukte, bezogen auf ein aktuelles Problem z.B. aus dem eigenen Promotionsthema.	6 C

Admission requirements: none	**Recommended previous knowledge:** Grundkenntnisse der empirischen Sozialforschung und der Statistik
Language: English	**Person responsible for module:** Prof. Dr. Achim Spiller
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module P.AG.0089: Advanced Methods in Molecular Life Sciences**	3 C 2 WLH

Learning outcome, core skills: Students learn to plan and design an experimental approach to address a scientific problem in the laboratory. Through autonomous research guided by supervision, students will learn to answer molecular biological questions with current laboratory techniques. Doctoral students will acquire a deep understanding of the underlying techniques and will be able to apply and combine them in a sensible manner. In the form of a presentation, students will learn to present the experimental design, which they have developed, in a convincing manner. Die Studierenden erlernen die Durchführung eines wissenschaftlichen Projekts im Labor zu planen. Durch Selbstrecherche und unter Anleitung lernen die Studierenden mithilfe aktueller Methoden molekularbiologische Fragestellungen zu beantworten. Dabei erlangen die Promotionsstudierenden i. W. eine vertiefte Methodenkompetenz und lernen über das reine Verständins der Methode hinaus, diese sinnvoll einzusetzen und verschiedene Methoden zu kombinieren. Durch Präsentation der Ergebnisse sollen die Studierenden lernen, einen selbst entwickelten Versuchsansatz überzeugend zu präsentieren.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Advanced Methods in Molecular Life Sciences (Lecture, Exercise) *Contents*: Students will receive a molecular biological problem to work on and ultimately solve. After two introductory lectures by the tutors, the participants should work on the problem at the level of the current state of research. Adequate methods should be researched and combined in a reasonable fashion in order to solve the assigned problem. To accomplish this goal, students will receive support during the seminar and example approaches will be presented by the tutors. Concluding students will have to present their approach to solving the problem. Den Studierenden wird ein molekularbiologisches Problem zur Bearbeitung und Lösung gegeben. Nach zwei einführenden Veranstaltungen durch die Dozenten haben die Studierenden die Aufgabe die Fragestellung auf dem aktuellen Stand der Forschung im Detail zu bearbeiten. Dazu sollen adequate Methoden recherchiert und kombiniert werden, um einen experimentellen Ansatz zur Lösung des Problems zu erarbeiten. Dazu wird in weiteren Veranstaltungen Hilfestellung gegeben und es werden exemplarische Ansätze vorgestellt. Abschließend sollen die erarbeiteten Ergebnisse in einer Präsentation vorgestellt werden.	2 WLH
Examination: Oral Presentation (approx. 45 minutes) **Examination requirements:** By giving a presentation students should show that they are capable of presenting state of the art research methods and approaches in a comprehensible manner.	3 C

Admission requirements:	**Recommended previous knowledge:**
none	none

Language: English	**Person responsible for module:** Dr. rer. nat. Clemens Falker-Gieske
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 8	

Georg-August-Universität Göttingen **Module P.AG.0091: Colloquium Agricultural Engineering**	6 C 3 WLH

Learning outcome, core skills: Anleitung zu selbstständigem wissenschaftlichen Arbeiten: • Präsentation und Diskussion von aktuellen Forschungsergebnissen • Einbinden der eigenen Ergebnisse in den Stand der Forschung • Diskussion mit Fachpublikum • Ableiten weiterer Fragestellungen aus den eigenen Ergebnissen	**Workload:** Attendance time: 42 h Self-study time: 138 h

Course: Kolloquium Agrartechnik (Seminar) *Contents*: Vorträge im Kolloquium werden von Doktoranden des Departments für Nutzpflanzenwissenschaften, wissenschaftlichen Mitarbeitern von An-Instituten und anderer Institutionen gehalten. Die Studierenden bekommen einen Überblick über aktuelle Forschungsthemen der Forschung in der Agrartechnik und angrenzender Gebiete in den Bereichen Pflanzenbau, Maschinenbau, Informatik und anderen.	3 WLH
Examination: 3 Fortschrittsberichte (Präsentation ca. 15 Minuten mit 1-seitigem Handout), unbenotet, not graded **Examination prerequisites:** Teilnahme an 18 Kolloquien **Examination requirements:** Sehr gute Kenntnisse des eigenen Forschungsgebietes.	6 C

Admission requirements: none	**Recommended previous knowledge:** Themenspezifisch
Language: German, English	**Person responsible for module:** Prof. Dr. Frank Beneke
Course frequency: each winter semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0092: Current topics in agroecology (Journal club)**	3 C 2 WLH

Learning outcome, core skills: The aim of the module is the critical examination, presentation and discussion of current articles on the topics of agrobiodiversity and agroecology (e.g. research article, review, perspective). The focus of the discussion should be on content, methods or analysis of writing style, presentation of results or structure/storyline. In addition, new methods of analysis or R packages can be presented and critically discussed.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Current topics in agroecology (Journal club) (Seminar) *Contents*: Each student must select a recent article related to agroecology and agrobiodiversity, present them during the seminar and lead a discussion within the group. All attendants must read the assigned article before each session and prepare discussion points. During the discussion, students will identify faults and successes of the methodology, data analysis and writing style of the manuscript. *Course frequency:* each semester	2 WLH
Examination: Presentation (approx. 20 min, 100%) and moderation of discussion **Examination requirements:** Selection of appropriate articles, critical evaluation of studies, methods and scientific writing style.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Catrin Westphal
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.AG.0093: Academic Researcher Skills - Conference Presentation**	3 C

Learning outcome, core skills: Doctoral students will learn to present their research at scientific conferences and to use appropriate techniques for this purpose.	**Workload:** Attendance time: 0 h Self-study time: 90 h

Course: Academic Researcher Skills - Conference Presentation (Seminar) *Contents*: Two scientific contributions must be presented orally on significant conferences as the first author. Conferences should have an international scope and audience. A written abstract or short paper must be submitted. In order to prepare for the conferences, instructions through a preparatory seminar / workshop should be provided and has to be completed that is closely related to presentation techniques. *Course frequency:* continuously	
Examination: Presentation at a scientific conference (english or german) **Examination prerequisites:** Completion of a seminar/workshop on relevant presentation skills **Examination requirements:** The performance will be confirmed in a written form by the first PhD supervisor or a member of the thesis committee, who is authorized to examine the PhD student. The confirming statement must acknowledge the attendance of the two scientific conferences and the written abstract/short paper. The completion of the preparatory seminar/workshop must also be acknowledged in the confirming statement.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** First examiner of PhD student or another authorized examiner of the PhD student's thesis committee
Course frequency: continuously	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations: Examples for external workshops can be found at the GFA qualification website

Georg-August-Universität Göttingen **Module P.AG.0094: Academic Researcher Skills - Supervising Students**	3 C

Learning outcome, core skills: Doctoral students will learn and apply basic skills required for supervising students when researching and writing their final theses.	**Workload:** Attendance time: 0 h Self-study time: 90 h

Course: Academic Researcher Skills - Supervising Students (Seminar) *Contents*: Two scientific contributions must be presented orally on significant conferences as the first author. Conferences should have an international scope and audience. A written abstract or short paper must be submitted. In order to prepare for the conferences, instructions through a preparatory seminar / workshop should be provided and has to be completed that is closely related to presentation techniques. *Course frequency:* continuously	
Examination: Supervision of bachelor/master thesis (english or german) **Examination prerequisites:** Completion of a seminar/workshop on relevant presentation skills **Examination requirements:** The performance will be confirmed in a written form by the first PhD supervisor or a member of the thesis committee, who is authorized to examine the PhD student. The confirming statement must give details about the student's performance in supervision. The completion of the preparatory seminar/workshop must also be acknowledged in the confirming statement.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** First examiner of PhD student or another authorized examiner of the PhD student's thesis committee
Course frequency: continuously	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations: Examples for external workshops can be found at the GFA qualification website

Georg-August-Universität Göttingen **Module P.AG.0095: Academic Researcher Skills - Teaching**	3 C 2 WLH

Learning outcome, core skills: Doctoral students will learn and apply teaching skills.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Academic Researcher Skills - Teaching (Seminar) *Contents*: Two scientific contributions must be presented orally on significant conferences as the first author. Conferences should have an international scope and audience. A written abstract or short paper must be submitted. In order to prepare for the conferences, instructions through a preparatory seminar / workshop should be provided and has to be completed that is closely related to presentation techniques. *Course frequency:* continuously	
Examination: Teaching 28 hours (english or german) **Examination prerequisites:** Completion of a seminar/workshop on relevant presentation skills **Examination requirements:** The performance will be confirmed in a written form by the first PhD supervisor or a member of the thesis committee, who is authorized to examine the PhD student. The confirming statement must give details about the student's performance in teaching. The completion of a seminar/workshop must also be acknowledged in the confirming statement.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** First examiner of PhD student or another authorized examiner of the PhD student's thesis committee
Course frequency: continuously	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations:
Examples for external workshops can be found at the GFA qualification website

Georg-August-Universität Göttingen **Module P.AG.0096: Academic Researcher Skills - Writing a research proposal**	3 C 2 WLH

Learning outcome, core skills: Doctoral students will learn and apply writing skills at writing a research proposal.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Academic Researcher Skills - Writing a research proposal (Seminar) *Contents*: Two scientific contributions must be presented orally on significant conferences as the first author. Conferences should have an international scope and audience. A written abstract or short paper must be submitted. In order to prepare for the conferences, instructions through a preparatory seminar / workshop should be provided and has to be completed that is closely related to presentation techniques. *Course frequency:* continuously	
Examination: Writing a research proposal (german or english) **Examination prerequisites:** Completion of a seminar/workshop on relevant presentation skills **Examination requirements:** The performance will be confirmed in a written form by the first PhD supervisor or a member of the thesis committee, who is authorized to examine the PhD student. The confirming statement must acknowledge the major contribution of the PhD student at writing the proposal. The completion of a seminar/workshop must also be acknowledged in the confirming statement.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English, German	**Person responsible for module:** First examiner of PhD student or another authorized examiner of the PhD student's thesis committee
Course frequency: continuously	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Additional notes and regulations: Examples for external workshops can be found at the GFA qualification website

Georg-August-Universität Göttingen **Module P.AG.0098: PhD Seminar Agricultural Entomology**	6 C 2 WLH

Learning outcome, core skills: Techniques of presentation and the ability to critically review and discuss research results will be practiced which will suggest and lead to new thoughts for further research projects	**Workload:** Attendance time: 28 h Self-study time: 152 h

Course: PhD Seminar Agricultural Entomology (Seminar) *Contents*: In this seminar progress reports of scientific PhD projects will be presented and discussed by PhD students and members of the research staff.	WLH
Examination: One presentation per semester (two in total) of own progress report **Examination prerequisites:** Participation in 12 seminars **Examination requirements:** Very good knowledge of own area of research and good ways of presentation of own results. Participation in discussion	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Michael Georg Rostás
Course frequency: each semester	**Duration:** 2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module P.AG.0099: PhD seminar agricultural economics and rural development**	6 C 3 WLH

Learning outcome, core skills:	**Workload:**
In the module, the participants submit their research results to a public discussion amongst specialist. The participants improve their speaking and presentation skills. By participating in other courses, the doctoral students receive a broad professional overview of current research topics and technical approaches of Agricultural Economics.	Attendance time: 42 h Self-study time: 138 h

Course: PhD seminar agricultural economics and rural development (Seminar) *Contents*: In the doctoral seminar, each PhD student at the Department of Agricultural Economics and Rural Development presents their work (design, empirical results, and so fourth) at least 3 times. The seminar will take place weekly during the semester.	3 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one’s own research areas.	6 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Silke Hüttel
Course frequency: each semester	**Duration:** 6 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 60	

Additional notes and regulations:
Sprache:

i.d.R. Englisch, auf Antrag Deutsch

Georg-August-Universität Göttingen **Module P.AG.0100: Scientific Working and Academic Writing for PhD Students in Agricultural Economics**	6 C 4 WLH

Learning outcome, core skills:	**Workload:**
This module will equip PhD students with advanced skills in research and academic writing, focusing on key aspects essential for successful dissemination of academic results. After successful completion of this course, students should be able to: • Understand how to write and structure an academic paper • Apply and critically reflect on professional concepts in presenting empirical results • Follow and evaluate best practice in relation to open science • Utilize AI tools for research and academic writing • Write and evaluate an academic paper/ research proposal • Understand the publishing process	Attendance time: 56 h Self-study time: 124 h

Course: Scientific Working and Academic Writing for PhD Students in Agricultural Economics *Contents*: This advanced research and academic writing module is based on a combination of lectures and practical exercises. Students will learn how to write and structure an academic paper, with detailed guidance on each section. The module emphasizes the presentation of empirical results, with detailed focus on statical inference and data sampling issues. Best practices in open science, ethical considerations, and responsible research conduct are also covered in the course. Students will also learn to use AI tools for the research and writing process. In addition, the course also provides insights into the publishing process, including open science trends, journal selection, and different article types. Finally, the course will offer training for conducting revisions and writing reviews. *Course frequency:* each winter semester	4 WLH
Examination: term paper (max. 2 pages), a research proposal or academic paper (max. 5 page) and complete a review of an academic paper (max. 2 pages), not graded **Examination requirements:** Advanced knowledge on how to write and structure academic papers, professional concepts when presenting research results, the use of Open Science in research, AI tools for research and writing, as well as the publishing process.	6 C

Admission requirements: none	**Recommended previous knowledge:** Basics in scientific working
Language: English	**Person responsible for module:** Prof. Dr. Doris Läpple Prof. Dr. Silke Hüttel
Course frequency:	**Duration:**

once a year1	1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: not limited	

Georg-August-Universität Göttingen **Module P.AG.0101: PhD Seminar Phytopathology and Plant Protection**	3 C 2 WLH

Learning outcome, core skills: Presentation of one’s own scientific project and its defense within the context of a discussion in English. Professionally critical and constructive follow-up discussion of others results.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Plant pathology and plant protection seminar (Seminar) *Contents*: Within this course, projects, project objectives and results will be presented to a scientific audience in English. A discussion amongst PhD students as well as scientific staff will follow. By doing so, students shall not only train their presentation technique and discussion skills, but also receive suggestions for further work in the discussion.	2 WLH
Examination: 3 Progress reports (written each max. 5 pages or oral each approx. 20 minutes) **Examination prerequisites:** Participation in 18 seminars **Examination requirements:** Very good knowledge of one’s own research areas.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Dr. Birger Koopmann
Course frequency: each semester	**Duration:** 2 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 30	

Georg-August-Universität Göttingen **Module P.PA.E0200: Efficiency and productivity analysis 2- Stochastic Approaches**	3 C 2 WLH

Learning outcome, core skills: PhD students obtain a deeper understanding of the microeconomic foundations of productivity and efficiency analyses. They learn the econometric basis for stochastic frontier analysis and become familiarized with the underlying test theory. Furthermore, they obtain the ability to follow current literature on the topic. The students are able to conduct their own analyses employing the introduced methods.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Efficiency and productivity analysis 2- Stochastic Approaches (Lecture, Exercise) *Contents*: The module is designed to teach participants the economic and econometric concepts which form the basis of stochastic frontier analysis. The module furthermore focuses on the empirical application of the methods, which will be introduced on the basis of example data on the computer. The extensive discussion of current publications on efficiency and productivity analysis in the areas of agriculture and development rounds off the class.	2 WLH
Examination: Oral examination (approx. 30 minutes) **Examination requirements:** Knowledge of the microeconomic foundations of productivity and efficiency analysis. Solid knowledge of the econometrical basis of stochastic frontier analysis and the underlying test theory	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Bernhard Brümmer
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Additional notes and regulations: every 4th semester; Summer semester

Georg-August-Universität Göttingen **Module P.PA.E0300: Time series analysis: Applications in agricultural and food economics**	3 C 2 WLH

Learning outcome, core skills: The PhD students obtain a deeper understanding of time-series analysis forming the foundation of market integration and volatility analyses. They deepen their knowledge of the econometrical basis of time-series analysis and familiarize themselves with the underlying test theory. Furthermore, they gain the skills in order to follow current literature on the topic. The students are able to conduct analyses by themselves using the introduced methods.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Time series analysis: Applications in agricultural and food economics (Lecture, Exercise) *Contents*: The module intends to teach participants the important foundations of time-series analysis. While doing so, the focus will mainly be on market integration and volatility analyses. Another emphasis will be put on empirical application of the methods, which will be introduced on the basis of example data on the computer. The extensive discussion of current publications on the application of time-series analysis in the areas of agriculture and development rounds off the class.	2 WLH
Examination: Practical assessment (ca. 30 Min.) **Examination requirements:** Knowledge of the time-series analysis forming the foundation of market integration and volatility analysis. Deepened knowledge of the econometric foundations of time-series analysis and the underlying test theory.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Bernhard Brümmer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 25	

Additional notes and regulations: Every 4th semester; Winter semester

Georg-August-Universität Göttingen **Module P.PA.SK2100: Scientific writing for agricultural economists**	3 C 2 WLH

Learning outcome, core skills: PhD students attain knowledge of the various journals in national and international agricultural economics. They are familiar with the steps and conventions of the peer-review-process from the perspectives of authors and reviewers. They know how to use the literature databases and literature search engines which are used in (agricultural) economics. They understand how a journal article should be structured. They are thus capable of presenting their own research results in a manuscript, identifying suitable journals to which they can submit their manuscript, and undergo all the steps of the reviewing process through to publication.	**Workload:** Attendance time: 20 h Self-study time: 70 h

Course: Scientific writing for agricultural economists (Lecture, Seminar) *Contents*: Introduction to the writing of articles for peer-review scientific journals in agricultural economics.	2 WLH
Examination: Homework (max. 2 pages) **Examination requirements:** Very good knowledge of the peer review journals in agricultural economics, the literature databases which are widely used in agricultural economics, and how they can be used. Understanding of the Impact Factor and how it is to be interpreted, how the peer review process works and whatis expected of authors and reviewers at various stages of this process.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Stephan von Cramon-Taubadel
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: once	**Recommended semester:**
Maximum number of students: 50	

Georg-August-Universität Göttingen **Module P.PA.T2200: Advanced Supply Chain Management**	6 C 2 WLH

Learning outcome, core skills: Die PhD-Studierenden erlangen ein tieferes Verständnis wesentlicher betriebswirtschaftlicher Fragen des Supply Chain Management. Sie erweitern ihr theoretisches Wissen und sind in der Lage, selbstständig die wichtigsten Konzepte, Methoden und inhaltlichen Aussagen eines Fachbeitrags zu erarbeiten, schriftlich wiederzugeben und vorzutragen. Die PhD-Studierenden erlangen wichtiges theoretisches Wissen, das ihnen bei der Konzeption ihrer empirischen Untersuchungen wie auch bei der Interpretation und Diskussion ihrer Untersuchungsergebnisse helfen wird.	**Workload:** Attendance time: 28 h Self-study time: 152 h

Course: Advanced Supply Chain Management (Seminar) *Contents*: Wertschöpfungsketten (Supply Chains) sind ein Teil der dominierenden Logik der Organisation von Material- und Informationsfüssen in der globalen Land- und Ernährungswirtschaft. Große Teile der Literatur zum Supply Chain Management basieren auf Organisationstheorien und Theorien des strategischen Managements. Anhand ausgewählter Fachbeiträge aus der internationalen Literatur werden die PhD-Studierenden mit vertieften Fragen und theoretischen Konzepten des Supply Chain Management vertraut gemacht. Schwerpunkte sind organisationstheoretisch geprägte Beiträge sowie Literatur aus dem Bereich des strategischen Managements. Die PhD-Studierenden erarbeiten selbst die wesentlichen Konzepte, Methoden und Aussagen sowie ggf. empirische Ergebnisse eines einschlägigen, wegweisenden Beitrags.	2 WLH
Examination: Oral Presentation (approx. 20 minutes) **Examination requirements:** Hinweis zum Leistungsnachweis: Präsentation, Referat (ca. 20 Minuten allein oder 30 Minuten gesamt in 2-3er Gruppe) und Diskussion müssen zur Erlangung von 3 C sowohl vorbereit als auch selbst präsentiert werden. Zur Erlangung der 6 C muss ein vollständiges Manuskript mit mindestens 5.000 Wörtern (Keywords, Abstract, Literaturverzeichnis und Anhang nicht eingerechnet) dem Modulverantwortlichen zur Prüfung eingereicht werden, zusammen mit einem Anschreiben von der Erstbetreuer/in, das entweder die Annahme bei einem double-blind-peer-review-Journal oder die Einreich-fertigkeit für ein solches bestätigt. Inhaltlich muss dieses Manuskript schwerpunktmäßig auf mindestens einer der in den Prüfungsanforderungen genannten Theorien aufgebaut sein. Das Modul kann entweder mit 3 C oder mit 6 C abgeschlossen werden. **Prüfungsanforderungen:** Kenntnisse der theoretischen und methodischen Konzepte, der Begriffe und der Forschungsmethoden des Supply Chain Management auf Grundlage von Beiträgen der	6 C

Organisationstheorie und des strategischen Managements. Folgende Theorien werden im Modul selektiv behandelt und im Rahmen des eingereichten Manuskripts anerkannt:

- Contingency Theory basierend auf Lawrence and Lawrence (1967),
- Stakeholder Management Approach basierend auf Freeman (1984) and Mitchell (1997) oder ähnliche Studien,
- Resource Dependence Theory,
- Resource Based View,
- „Five Forces“ und Competitive Strategy mit Bezug auf Porter (1980),
- Transaction Cost Theory basierend auf Williamson (1985),
- Theory of Bureaucracy,
- Principle-Agent-Theory,
- Property-Rights-Theory,
- Power Concept mit Bezug auf Mintzberg (1983),
- Cooperative Models basierend auf Chaddad &Cook (2004) oder ähnliche Studien,
- Industry Concentration Concepts basierend auf Tremblay &Tremblay (2012) oder ähnliche Studien,
- Performance Measurement Aramyan et al. (2006) oder ähnliche Studien; ähnliche Studien nach vorheriger Rücksprache.

Admission requirements: Mitgliedschaft im Promotionsprogramm IPAG, PAG oder Agrarökonomik, weitere Programme nach Rücksprache	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Ludwig Theuvsen
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 20	

Georg-August-Universität Göttingen **Module P.SFS.CC01: Sustainable food systems: Perspectives from various scientific disciplines**	3 C 2 WLH

Learning outcome, core skills:	**Workload:**
Students understand the main sustainability issues of food systems in high-, middle, and low-income countries and related trends and challenges. They are familiar with the effects of food production, trade, and consumption on human health and planetary health and recognize synergies and tradeoffs from multidisciplinary perspectives.	Attendance time: 28 h Self-study time: 62 h

Course: Sustainable food systems: Perspectives from various scientific disciplines (Lecture, Seminar) *Contents*: This module familiarizes students with the latest thinking in food systems research, focusing on links between agriculture, nutrition, health, climate, the environment, and other dimensions of economic and social sustainability. The course will be co-taught by lecturers from different disciplines, helping students to develop an integrated food systems lens and better understand how their own research work fits into the bigger global picture.	2 WLH
Examination: Written essay, 10 pages max. (70%) and oral presentation, approx. 20 minutes (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Links between food systems and Sustainable Development Goals (SDGs).	3 C

Admission requirements:	**Recommended previous knowledge:**
Completed Master's Programme in areas relevant to sustainable food systems	Familiarity with general issues of sustainable development
Language: English	**Person responsible for module:** Prof. Dr. Matin Qaim
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.CC02: Experimental and econometric approaches for food systems analysis**	3 C 2 WLH

Learning outcome, core skills:	**Workload:**
Students are able to assess the main empirical (experimental and econometric) approaches that can be used to study food systems related questions using primary or secondary data. They have a basic familiarity with statistical software and are able to plan an experiment/carry out an econometric analysis on their own.	Attendance time: 28 h Self-study time: 62 h

Course: Experimental and econometric approaches for food systems analysis (Lecture) *Contents*: This module familiarizes students with empirical research methods for food systems research. The course consists of four components: The first part will cover the design and analysis of randomized controlled trials. The second part will review quasi-experimental methods, including matching, difference-in-difference, instrumental variables, and regression discontinuity designs. The third part will discuss the design, implementation and analysis of data from lab and lab-in-the-field experiments, whereas the fourth part will introduce regression-based modelling of consumption choices. In all parts, the methods will be discussed in the context of applications from food systems research. The course will be co-taught by lecturers from different disciplines. *Course frequency:* WiSe (irregular, according to RTG cohorts)	2 WLH
Examination: Hand-in of four take-home exercise sheets (max. 5 pages each, 100%) **Examination requirements:** Understanding of experimental and econometric approaches for food systems analysis.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with basic statistical/econometric methods.
Language: English	**Person responsible for module:** Prof. Dr. Krisztina Kis-Katos
Course frequency: WiSe (irregular, according to RTG cohorts)	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.CC03: Interdisciplinary Research Methods for Food Systems Analysis**	3 C 2 WLH

Learning outcome, core skills: Students gain an overview of interdisciplinary methods and metrics to assess food systems performance. They are familiar with selected methods and approaches, e.g., food security and nutrition metrics, ecosystem services and related economic valuation methods, analysis of economic-ecological tradeoffs, scenario development, and lab-in-the-field experiments to analyze producer and consumer preferences. Students understand how these approaches can be applied in the context of food systems analysis and how to interpret the generated results.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Interdisciplinary Research Methods for Food Systems Analysis (Lecture, Seminar) *Contents*: This module provides an overview of interdisciplinary methods and metrics for food systems analysis. Selected methods are introduced in keynote lectures held by lecturers from different disciplines. Lectures are complemented with practical exercises, in which students work in groups to deepen their knowledge on selected methods. The results of the group work are presented and discussed in class.	2 WLH
Examination: Oral examinationoral presentation, approx. 30 minutes (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Application of selected interdisciplinary methods to address issues in the context of food systems analysis.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with basic statistical methods
Language: English	**Person responsible for module:** Prof. Dr. Meike Wollni
Course frequency: each winter semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.CC04: Transdisciplinary approaches to sustainable food systems**	3 C 2 WLH

Learning outcome, core skills: After completing this module students will comprehend the fundaments of transdisciplinary approaches to sustainable food systems. They are familiar with concepts of sustainability science, for example planetary boundaries and social-ecological systems. They are also able to design and implement participatory research processes.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Transdisciplinary approaches to sustainable food systems (Lecture, Seminar) *Contents*: This module will introduce doctoral researchers to transdisciplinary concepts and methods that facilitate understanding of the global connections and sustainability tradeoffs of food systems. In the first part, the course will teach systems-based concepts of central importance for the understanding of sustainable food systems. In the second part, transdisciplinary methods to integrate diverse disciplinary data and approaches will be highlighted.	2 WLH
Examination: Written essay, 10 pages max. (70%) and oral presentation, approx. 20 minutes (30%). **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Profound understanding of transdisciplinary approaches in sustainability science and awareness of the role of these approaches in students' PhD research.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with general issues of sustainable development
Language: English	**Person responsible for module:** Prof. Dr. Tobias Plieninger
Course frequency: each summer semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:** from 2
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.CC05: Good Scientific Practice**	3 C 2 WLH

Learning outcome, core skills: Students understand the most common research ethics guidelines and the DFG principles of good scientific practice. They can develop a study protocol and a concept for data handling for applications to institutional review board / ethics committees. They are also able to serve as reviewer for such applications.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Good Scientific Practice (Lecture, Seminar) *Contents*: This module will cover principles of research ethics, collection, handling, and storage of research data, research involving human subjects, scientific cooperation, conflict of interest, and misconduct, among others. It will cover the most important ethics guidelines and the DFG principles of good scientific practices. It will include both theoretical and practical components.	2 WLH
Examination: Application to an institution review board / ethics committee for a project, max. 15 pages (70%), review of another application, max. 2 pages (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Understanding of most common research ethics guidelines and the DFG principles of good scientific practice.	3 C

Admission requirements: Admission to the RTG 2654	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Sebastian Vollmer
Course frequency: each summer semester	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.CC07: Doctoral seminar on sustainable food systems**	3 C 1 WLH

Learning outcome, core skills: Students can effectively present their research ideas and results on topics related to sustainable food systems and engage in meaningful scientific discussion on research methods and contents. Students are able to critically comment on the work of others.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Doctoral seminar on sustainable food systems (Seminar) *Contents*: In this seminar, students present their own doctoral research proposals and papers and get critical feedback from other participants. Students also comment on the papers and presentations of others and actively participate in seminar discussions.	1 WLH
Examination: Written paper, 30 pages max. (70%), oral presentation, approx. 20 minutes (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Profound understanding of own research topics and methods and ability to identify own contributions to the broader research field.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with relevant research methods
Language: English	**Person responsible for module:** Prof. Dr. Meike Wollni
Course frequency: each summer semester; Annually during three-year PhD Program	**Duration:** min. 2
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC01: Advanced Theories of Consumer Research**	3 C 2 WLH

Learning outcome, core skills: Students get an overview about advanced theories of consumer research und develop an understanding for asking profound research questions und for newer development in the field. Theses skills allow them to apply hypotheses formulation and testing and to develop adequate research frameworks and methods.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Advanced Theories of Consumer Research (Seminar) *Contents*: In this seminar, students hear interactive lectures on consumer research in different fields and learn about selected theories of consumer research. In addition, the application of such theories using hypothesis testing with structural equation models and latent class analyses are part of the course.	2 WLH
Examination: Oral Presentation (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Oral presentation of a selected research paper published in a peer-reviewed journal that uses a theory of consumer behavior. The paper should be presented and critically reflected.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with relevant research methods
Language: English	**Person responsible for module:** Prof. Dr. Achim Spiller Dr. Gesa Busch
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC02: Applied microeconometrics**	3 C 2 WLH

Learning outcome, core skills: Students learn the basic logics behind each econometric model, understand the tests for model specification, and appropriately explain the model outputs in connection to economic theories.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Applied microeconometrics (Lecture) *Contents*: This course mainly teaches how to correctly apply basic econometric models to studying specific research questions for master level students in agricultural economics, agribusiness, and related programs at the University of Goettingen. The main software package used in this course will be R. *Course frequency:* irregular	2 WLH
Examination: Written examination (120 minutes) **Examination requirements:** It is recommended to read the discussed papers in advance. Understanding the microeconometric models taught in the class and apply Stata to the topics discussed in the class.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with basic statistical/econometric methods.
Language: English	**Person responsible for module:** Prof. Dr. Xiaohua Yu
Course frequency: irregular	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC03: Applied time series analysis**	3 C 2 WLH

Learning outcome, core skills: The objective of this course is bridge the gap between standard introductory econometrics at the MSc level and modern time series techniques as used in concurrent publications in the AgEcon literature by presenting some theoretical background of these methods and illustrating applications in agricultural economics in order to enable participating PhD students to apply these tools in their research.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Applied time series analysis (Lecture, Seminar) *Contents*: Modern tools in time series analysis have become increasingly popular over the last decades in agricultural economics and rural development studies. This course will give an overview of the methods in these fields from an applied econometrics perspective. The significance and the advances in these fields have recently found their peak in honoring the work of the two most known researchers in time series analysis, namely Robert F. Engle and Clive W. Granger, by the Nobel Prize Committee in 2003. Teaching method include a block course of lectures and hands-on software practice. *Course frequency:* Every Second Summer Semester	2 WLH
Examination: Oral Presentation (approx. 45 minutes) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Understanding time series applications in the AgEcon literature; application of econometric toolbox to AgEcon time series data. Presentation of practical application in the tutorial including interpretation of results and moderating the subsequent discussion.	3 C

Admission requirements: none	**Recommended previous knowledge:** Intermediate econometrics
Language: English	**Person responsible for module:** Prof. Dr. Bernhard Brümmer
Course frequency: Every Second Summer Semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC04: Consumer behavior and demand analysis: Theory and applications**	3 C 2 WLH

Learning outcome, core skills: Students learn the basic logics behind each econometric model, understand the tests for model specification, and appropriately explain the model outputs in connection to economic theories for consumer and demand analysis.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Consumer behavior and demand analysis: Theory and applications (Lecture) *Contents*: This course helps understand the fundamental economic theory of consumer behaviors and practice demand analysis. This course includes two parts: Part I introduces the basic theory and Part II applies the theory to demand analysis using data from developing countries. After a brief review of the basic theory, this course will focus on econometric models for demand analysis, extension of basic theories, estimation of demand for nutrition. *Course frequency:* irregular	2 WLH
Examination: Written examination (120 minutes) **Examination requirements:** It ist recommended to read the discussed papers in advance. Understanding theories for consumer behavior and their applications to demand models for food analysis.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with basic statistical/econometric methods with R and Stata.
Language: English	**Person responsible for module:** Prof. Dr. Xiaohua Yu
Course frequency: irregular	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC05: Consumer Science & Public Policy**	3 C 2 WLH

Learning outcome, core skills: After successful attendance the students should understand the public policy implications of consumer behavior. Moreover, they should be able to craft concrete policy suggestions based on recent consumer research. In addition to understanding how consumer research can be linked with public policy initiatives, course participants will learn how to craft concrete policy suggestions themselves based on recent consumer research. Crafting policy suggestions also includes the identification of areas of application to which specific research findings can be transferred.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Consumer Science & Public Policy (Lecture, Seminar) *Contents*: The course consists of two parts, a lecture and a term paper. In the lecture, students are introduced to various topics where consumer research has policy implications. These topics include, but are not limited to: • Introduction to consumer science & public policy • Transformative consumer research • Nutrition and health • Consumer vulnerability and protection • Marketplace morality: ethics and social responsibility The term paper will contain a summary of selected research on a given topic (consumer science part). Moreover, participants are expected to critically discuss current policies in the area and to formulate additional public policy implications. The papers will be presented in class. *Course frequency:* Summer Term, irregular	2 WLH
Examination: Written essay, 10 pages max. (70%) and oral presentation, approx. 20 minutes (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Health marketing, food marketing, ethics, consumer protection, transformative consumer research.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with general issues of consumer behavior
Language: English	**Person responsible for module:** Prof. Dr. Yasemin Boztug
Course frequency: Summer Term, irregular	**Duration:** 1 semester[s]

Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC06: Efficiency and productivity analysis**	3 C 2 WLH

Learning outcome, core skills: The learning objectives address both conceptual and methodological issues. It will be designed to bridge the gap between theory and practice in efficiency and productivity analysis. To accomplish this objective, theory and method sessions will be followed by concrete examples of empirical applications and practical exercises. Students will understand the underlying theory and become familiar with the software to initiate their own research project using parametric approaches to modeling efficiency and productivity.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Efficiency and productivity analysis (Lecture, Seminar) *Contents*: The course on stochastic approaches to efficiency and productivity analysis will introduce the participants to economic analytical concepts and specifications of a set of econometric frontier models and their concrete applications. The stochastic frontier approach will constitute the core of the course. This approach coupled with the microeconomic theory of the firm provides firm-specific measurement of efficiency and best-practice role models for improving performance.	2 WLH
Examination: Oral Presentation (approx. 45 minutes) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Understanding microeconomic foundations of efficiency and productivity analysis, ability to apply econometric toolbox, and interpret results. Presentation of practical application in the tutorial including interpretation of results and moderating the subsequent discussion.	3 C

Admission requirements: none	**Recommended previous knowledge:** Intermediate econometrics, microeconomics
Language: English	**Person responsible for module:** Prof. Dr. Bernhard Brümmer
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC07: Global Health**	3 C 2 WLH

Learning outcome, core skills: The goal of this course is to provide students with a comprehensive understanding of global health. By the end of the course, students will be able to explain the main concepts of global health. They can describe linkages between health and economic development and describe determinants of health and different components of health systems. Students will be familiar with the concept of burden of disease and with risk factors and how the health status is measured. They can describe key measures to address the burden of disease in cost-effective ways. They can read, discuss and present recent scientific literature in the global health field and write a clear and concise policy brief tailored to a specific audience.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Global Health (Lecture, Seminar) *Contents*: The course will introduce students to the main concepts of the public health field and critical links between global health and economic development. Students will get an overview of the determinants of health and learn how health status is measured. The course will be global in coverage, but with a focus on low- and middle-income countries and on the health of the poor. The course will cover: • Global health concepts • Linkages between health and development • Global burden of disease, measurement and global trends • Determinants of health and social network effects • Health disparities • Health systems • Global health efforts • Health behaviour in developing countries	2 WLH
Examination: Written essay, 10 pages max. (70%) and oral presentation, approx. 20 minutes (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Students will gain an understanding of the relevant global health concepts and an ability to formulate adequate policy recommendations.	3 C

Admission requirements: Admission to the RTG 2654	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Sebastian Vollmer
Course frequency: each summer semester	**Duration:** 1 semester[s]

Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC08: Market Integration and Price Transmission**	3 C 2 WLH

Learning outcome, core skills:	**Workload:**
Doctoral students have read key articles in the literature on market integration and price transmission and understand the theories and methods employed in these articles. Students are able to identify open questions and research topics in this topic area, and to design and carry out corresponding research projects. They are in a position to discuss topics in market integration and price transmission with other experts and to present their own results to specialists in seminars and at conferences.	Attendance time: 28 h Self-study time: 62 h

Course: Market Integration and Price Transmission (Lecture, Seminar) *Contents*: Theory and empirical analysis of agricultural market integration. Regarding vertical price transmission, the module introduces a simple model of the farm-retail price spread, empirical applications, the effect of market power on vertical price transmission, asymmetric price transmission, and the analysis of retail prices. Regarding horizontal or spatial price transmission, the module introduces a simple model of spatial equilibrium, empirical applications, accounting for transaction costs in spatial trade, and the effects of temporal and spatial data aggregation. The module is a reading course for advanced students. *Course frequency:* Every Second Summer Semester	2 WLH
Examination: Presentation (approx. 20 minutes, 50%) and oral examination (approx. 20 minutes, 50%). **Examination requirements:** Knowledge and understanding of received methods in empirical price transmission analysis and the ability to understand and interpret journal articles in the area of market integration and price transmission. Reading the assigned articles before class and actively participating in the discussions is recommended.	3 C

Admission requirements:	**Recommended previous knowledge:**
none	Intermediate econometrics
Language: English	**Person responsible for module:** Prof. Dr. Stephan von Cramon-Taubadel
Course frequency: Every Second Summer Semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC09: Micro-macro linkages in development economics**	3 C 2 WLH

Learning outcome, core skills: Students are able to apply various quasi-experimental methods of econometrics to link macro processes to outcomes measured at the micro level (consumption, labor market, health and other social outcomes) within the context of development economics research.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Micro-macro linkages in development economics (Lecture) *Contents*: This module provides a technical introduction to shift-share approaches in econometrics and also touches upon other quasi experimental methods used for causal identification. The goal is to understand how to causally link macro processes (like trade liberalization, migration, FDI, global aid flows, etc.) to micro-level outcomes relying on spatio-temporal variation in the exposure to macro shocks or policy changes. Beyond focusing on econometric techniques, the lectures will also discuss recent research papers that apply shift-share and related methodology. The take-home problem sets will require partial re-estimation of the discussed papers and/or the development of own shift-share ideas. *Course frequency:* irregular	2 WLH
Examination: Hand-in of four take-home problem sets (max. 20 pages in total) **Examination requirements:** It is recommend to read the discussed papers in advance. Understanding of shift-share approaches and other quasi-experimental methods for causal identification.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with basic statistical/econometric methods; PhD module in RTG 2654 P.SFS.CC02.
Language: English	**Person responsible for module:** Prof. Dr. Krisztina Kis-Katos
Course frequency: irregular	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC10: Public controversies over food science and technology**	3 C 2 WLH

Learning outcome, core skills:	**Workload:**
Students understand the typical dynamics and mechanisms underlying public controversies over food science and technology. They are familiar with content production, media usage, message reach and distribution as well as with media perceptions and effects in controversies over food science and technologies in digital high-choice media environments.	Attendance time: 28 h Self-study time: 62 h

Course: Public controversies over food science and technology (Lecture, Seminar) *Contents*: This module familiarizes students with the latest research on the dynamics of public controversies over food science and technology. The course will include units on news audiences, journalism, stakeholder communication as well as media effects on individuals and public opinion formation in societal debates over food science and technologies. These topics will be looked at in international comparison doing justice do different media systems and journalism cultures.	2 WLH
Examination: Written essay, 10 pages max. (70%) and oral presentation, approx. 20 minutes (30%) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Give theoretical explanations for observable patterns in ongoing controversies over food science and technologies.	3 C

Admission requirements:	**Recommended previous knowledge:**
Completed Master's Programme in areas relevant to sustainable food systems	none
Language: English	**Person responsible for module:** Prof. Dr. Senja Post
Course frequency: each winter semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 25	

Georg-August-Universität Göttingen **Module P.SFS.EC11: Risk analysis and risk management in agriculture**	3 C 2 WLH

Learning outcome, core skills: The Ph.D. students acquire the methodological tools for measuring, analyzing and managing risks on farms. They are able to identify the problems, which can occur in individual case and are able to apply appropriate techniques to solve the problem. They gain methodological competences for their own research work.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Risk analysis and risk management in agriculture (Lecture) *Contents*: The focus of this module is on risk measurement, risk analysis and risk management. The topics include distributions and stochastic processes, value-at-risk-concept, risk programming approaches, insurances, valuation of derivatives including weather derivative. *Course frequency:* irregular	2 WLH
Examination: 2 assignments (max. 5 pages each) **Examination prerequisites:** Regular attendance and participation in seminar sessions **Examination requirements:** Understanding of expected utility theory, pricing of derivatives, stochastic processes, innovative risk management instruments, real options approach.	3 C

Admission requirements: Completed Master's Programme in areas relevant to sustainable food systems	**Recommended previous knowledge:** Familiarity with MS-EXCEL and basic stochastic models.
Language: English	**Person responsible for module:** Prof. Dr. Oliver Mußhoff
Course frequency: irregular	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	

Georg-August-Universität Göttingen **Module P.SFS.EC12: Topics in Rural Development Economics**	3 C 2 WLH

Learning outcome, core skills: The objective of this course is to acquaint students with the reading and understanding of scientific journal articles on relevant topics of rural development economics. Students should learn how to develop a scientific research question, choose appropriate research methods and structure a scientific article.	**Workload:** Attendance time: 28 h Self-study time: 62 h

Course: Topics in Rural Development Economics (Lecture, Seminar) *Contents*: This course will provide students with an overview of relevant topics in rural development economics, which will also enable them to develop own research questions and study approaches in this field. The module is structured as a reading course, building on selected articles from relevant international journals. Students are required to read announced articles before the classroom sessions, in order to enable a critical debate in class. The articles selected for the course are clustered around key topics relevant to rural development economics, such as listed below. Tentative Topics: 1. The food system transformation and smallholder farmers 2. Rural livelihood strategies and income diversification 3. Adoption and impact of modern agricultural technology 4. Economics of nutrition and health 5. Gender and intra-household resource allocation	2 WLH
Examination: Oral Presentation (approx. 45 minutes) **Examination requirements:** Reading the assigned articles before class and actively participating in the discussions is recommended. Identifying the main messages and methodological aspects of a scientific article. Presentation of a scientific article in class and moderating the subsequent discussion.	3 C

Admission requirements: none	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Meike Wollni
Course frequency: each summer semester	**Duration:** 1 semester[s]
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 40	

Georg-August-Universität Göttingen **Module P.SFS.PS01: Professional skills**	3 C 3 WLH

Learning outcome, core skills: 3 out of 6 Seminars have to be chosen. **Intercultural communication**: The aim of the course is to enhance the knowledge about constructive collaboration in international groups. The participants will learn to reflect on their own learned communication patterns, to recognize obstructive behavior and to replace it with constructive alternatives, thus strengthening cooperation. This serves to prevent conflicts – e.g. by avoiding misunderstandings – and it also strengthens a confident, positive handling of existing differences. **Gender and Diversity**: The aim of the course is to enhance the knowledge about gender equality and diversity questions. Participants gain knowledge and leadership in an important and sensitive field of discussion. They learn how to achieve higher performance when taking gender equality and diversity into account. Participants will better understand conflict-dynamics, how to avoid them, how to address them, and how to solve them. They understand the potential that rests in establishing an engaged, open and inspiring working culture, thus enabling excellence in research and science. **Presentation Skills**: The aim of the course is to improve the knowledge regarding giving scientific presentations and taking part in academic discussions. Participants will develop a solid foundation of effective presentation strategies, learn how to prepare for talks and poster presentations, and how to improve own presentation skills. **Science communication**: Participants will learn how to communicate their research and results to the broader audience. They gain an overview of the main components and tools in science communication. **Change management**: Participants will understand the dynamic of change processes, related to the team, the organizational, and the society. They understand the principles of resistance, get to know leadership approaches towards change, and learn methods to deal with resistance and implement change. A focus will be on the difficulties to work successfully across cultures and genders as an example of such a change process in research institutions such as universities. **Career development and job market skills**: The participants have an overview about current methods in job applications in the international context. The focus is on applications for international organizations and institutions in the field of sustainable food systems, for NGO's, and for the private sector. Methods and ways in describing individual strengths and competencies in the CV will be explained and experienced. Participants do active exercises like mock-interviews as used in assessment procedures in the international context.	**Workload:** Attendance time: 42 h Self-study time: 48 h

Course: Intercultural communication (Seminar) *Contents*: The focus of this course is to understand that doing a doctorate or working within an international group of researchers is certainly both inspiring and supportive on the one hand and challenging on the other hand. The different cultural backgrounds and imprints	1 WLH

of the group members can harbor additional potential for conflict. The workshop will contain: • Learning the basics of Marshall Rosenberg's communication approach • Diversity aspects including gender & intercultural aspects in communication • Mindful cooperation between different and within groups such women and men, international groups, and other aspects of diversity • Applications through role plays and a the use of a "tool-box" suitable for everyday use.	
Examination: Oral Presentation (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar **Examination requirements:** Recognition of gender stereotypes and other conflict-prone "labels" and ways to dissolve them.	1 C

Course: Gender and Diversity (Seminar) *Contents*: Nurturing gender and diversity competences and creating awareness for existing gender roles and constraints among both men and women are important steps towards gender equality and female empowerment as well as diversity and and establishing a welcoming culture. Topics will include • Status Quo: Effects of a lack of gender equality and diversity in research • Gender and diversity management: Chances and risks • How to develop gender and diversity competences • How to become agents of change	1 WLH
Examination: Oral Presentation (approx. 30 minutes) **Examination requirements:** Understand conflict-dynamics, how to avoid them, how to address them, and how to solve them.	1 C

Course: Presentation Skills (Seminar) *Contents*: The focus of this course is: • How to better transport the message (storyline, pictures, argumentation) • How to improve presentation style • How to improve slides • How to structure a poster • Practice the talk	1 WLH
Examination: Oral Presentation (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar **Examination requirements:** Preparation for scientific presentations.	1 C

Course: Science communication (Seminar)	1 WLH

Contents: The focus of this course is: • Tools to successfully communicate research • Useful tips and common mistakes • How to make a good story • Working with journalists and the press	
Examination: Oral Presentation (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar **Examination requirements:** Successfully communication for research.	1 C

Course: Change management (Seminar) *Contents*: The focus of this course is: • Leadership in times of change • Learning organizations • Individual resistance • Team and organizational dynamics • Implementing and managing change	1 WLH
Examination: Oral Presentation (approx. 30 minutes) **Examination prerequisites:** Regular attendance and participation in seminar **Examination requirements:** Understanding how to deal with change and build resilience.	1 C

Course: Career development and job market skills (Seminar) *Contents*: The focus of this course is: • Characteristics of application- and recruitment procedures within International Organizations, NGOs and in the private sector • How to read a job description? • How to show competencies in my CV? • How to demonstrate the right motivation for the position in question? • How to structure a "Letter of Motivation" for International Organizations, NGOs and in the private sector? • Elevator pitch presentations, competency-based interviews and multi-modal interviews, assessment center, etc.	1 WLH
Examination: Oral Presentation (approx. 15 minutes, 80%) and writing sample (max. 3 pages, 20%) **Examination prerequisites:** Regular attendance and participation in seminar **Examination requirements:** Preparing a good application and interview.	1 C

Admission requirements: Membership in RTG 2654	**Recommended previous knowledge:** none
Language: English	**Person responsible for module:** Prof. Dr. Meike Wollni
Course frequency: irregular	**Duration:**
Number of repeat examinations permitted: twice	**Recommended semester:**
Maximum number of students: 15	