Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

Index

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09-MK 01 (AO/EÖ)	**Organisation and Corporate Governance in the Agro-Food Industry**	**2nd sem.**	**6 CP**
Module	Organisation and Corporate Governance in the Agro-Food Industry		
Module code	MKA 01		
Faculty/Chair/ Department	Faculty 09/Economics of the Food Industry/Institute for Food Industry Economics and Agrarian Economy		
Associated degree course(s)/Semester taken	Master of Agrarian Economy and Business Management, Nutritional Economics [1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basic knowledge that needs to be gained with the aid of preparatory teaching material (primer)		
Learning outcomes	The students • are able to solve economic decision-making problems in organisation and strategy; • master strategic and operative management techniques; • are able to recognise and apply theoretical and practical solutions to problems; • participate in discussions about and further develop new international theories of management and management styles.		
Module content	• strategic company leadership and company policy • competitive strategies in the food industry and agricultural economics • structural and competitor analysis, strategic technology and environmental management • shaping elements of company management: innovation management, crisis and risk management • economic theories of coordination, motivation, contracts and incentives • organisational structures for companies in the food industry		
Form(s) of instruction	Lecture (60%), tutorials (40%)		
Total workload in hours	180	**Credit points:** 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture:36, tutorial: 24		
Ab Preparation/revision	90 consisting of: lecture:60, tutorial: 30		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/foodeconomics
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MKA 03 (AÖ/EÖ)	**Applied Econometrics**	**1st Sem.**	**6 CP**
Module	Applied Econometrics		
Module code	MK 03		
Faculty/Chair/ Department	Faculty 09/Market Theory/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Agricultural Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can explain how econometric models are formulated and how tests of hypothesis are performed; • know how to interpret different econometric models how these can be applied to agricultural and agribusiness; • know how to perform a demand, supply, or price analysis for a given food market with the help of the software package TSP, and to summarise these in a written assignment.		
Module content	Understanding of: • basic probabilistic and statistical principles in econometrics; • simple linear and multiple regression models; • test measures in regression analysis; • functional forms; • problems of econometric analysis: multicollinearity, autocorrelation, heteroscedasticity • applications in agricultural and food economics: • introduction to practical work using the econometric software package TSP; • econometric demand analysis; • econometric supply analysis; • econometric analysis of simultaneous market models; • econometric price analysis; • application of panel models in agricultural and food economics		
Form(s) of instruction	Lecture (70%), tutorials (30%)		
Total workload in hours	180	**Credit points**: 6 ECTS credits	
Module composition: A Courses in total	100		
Aa Contact hours	60 consisting of: lecture:42, tutorial: 18		
Ab Preparation/revision	40		
B Autonomous work	50, writing an econometric written assignment		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, econometric written assignment Mark: written examination (70%), econometric written assignment (30%) Written examination (70%), econometric written assignment (30%) Written examination (70%), econometric written assignment (30%)		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1313/apopr1.htm

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

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09-MK 05 (NT)	**Laboratory Course Nutrition Physiology of Animals**	**1st Sem.**	**6 CP**
Module	Laboratory Course Nutrition Physiology of Animals		
Module code	MK 05		
Faculty/Chair/ Department	Faculty 09/Animal Nutrition/ Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	Master of Nutritional Science, Master of Livestock Sciences[1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • implement qualitative tests for the detection of nutrients as well as digestive and metabolic products; • analyse and evaluate the nutritional content of chymus, blood and urine; • master different methodological approaches and concepts for the analysis of digestive processes, transport of substances and metabolism (energy, nutrients); • gain in-depth knowledge of nutritional parameters and the skills for analysing them and interpret those in scientific writing.		
Module content	• application of nutritional methods in nutrient analysis and the evaluation of nutrients in animal food • analysis of chosen minerals, vitamins, carbohydrates, proteins, amino acids, and lipids and interpretation of the results • analysis of unwanted substances in animal food		
Form(s) of instruction	laboratory course in small groups (90%) with introductory seminar (10%)		
Total workload in hours.	180	**Credit points**: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: introductory seminar: 6, laboratory: 54		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	15		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition/

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

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09- MKA 06 (AÖ)	**Field and Process Analysis in Extension**	**2nd Sem.**	**6 CP**
Module	Field and Process Analysis in Extension		
Module code	MKA 06		
Faculty/Chair/ Department	Faculty 09/Agricultural Sociology/Institute for Agricultural Sociology and Extension		
Associated degree course(s)/Semester taken	Master of Agricultural Economics and Business Management[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students should be able to: • describe and define quantitative and qualitative methods of empirical social research; • identify, apply and evaluate methods for the data-collection; • understand the acquisition and evaluation of empirical data; • describe, analyse and evaluate work methods inextension; • develop and establish the steps in an analysing process; • have collected and reflected on their experience in collaboratively carrying out a team project; • have explored for themselves important areas in the field ofextension.		
Module content	• concept and paradigm of empirical social research • quantitative empirical methods • questioning and interview • quantitative evaluation methods • qualitative empirical methods • hermeneutical evaluation of qualitative data • characteristics of the field of extension • forms of organisation, understanding of processes and the target groups of extension • project for exploring the field of extensionand typical and important definitions of problems		
Form(s) of instruction	Lecture (50%), seminar (25%), project (25%)		
Total workload in hours.	180	**Credit points**: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture:30, seminar: 15, project: 15		
Ab Preparation/revision	40 consisting of: lecture:20, seminar:20		
B Autonomous work	50		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, project presentation, project report Mark: oral examination (40%), project presentation (40%), project report (20%) Respective part of the examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/kub/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

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09-MK 07 (AB)	**Animal Nutrition**	**2nd sem.**	**6 CP**
Module	Animal Nutrition		
Module code	MK 07		
Faculty/Chair/Department	FB09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	Master of Science Agrobiotechnology/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can describe the basics of digestion and the metabolism of primary nutrients; • know the parameters of the metabolic rate and the energy evaluation systems; • are familiar with the origin, quality criteria, quality management, conservation, and use of animal feeds; • know the basics of animal feed law; • can apply the different feeding systems for farm animals in formulating feeding recipes; • understand the relationships between nutrition and performance, nutrient loss, animal health and product quality		
Module content	• nutritional physiology of farm animals • chemical composition (food, animal) • digestion and utilisation of nutrients (carbohydrates, proteins, lipids) • metabolic rate and energy evaluation systems • minerals and vitamins (functional significance, feed situation) • characteristics, quality criteria, and chief applications of animal feed • fundamentals of feed conservation, storage, and preparation • nutrition of farm animals • energy and feed demand of farm animals during the breeding, reproduction, and growing phase • feeding strategies and feeding recipes • the influence of nutrition on performance, nutrient loss, health and product quality		
Form(s) of instruction	Lectures (90%) and exercises (10%)		
Total workload in hours	180	**Credit points:** 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	-		
B Autonomous work	60		
C Final module examination	60		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended participation	2nd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition
Required literature: see Stud.IP or homepage

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09-MK 08 (AÖ/NT) /	**Agricultural Technology**	**1st Sem.**	**6 CP**
Module	Agricultural Technology		
Module code	MK 08		
Faculty/Chair/ Department	Faculty 09/Plant Production/Institute for Plant Production and Plant Breeding/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	Master of Agricultural Economy[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the handling of information, substance and energy flows; • formulate and develop planning strategies for the use of machinery and the procedures of agricultural production processes; • apply methods of agricultural quality management to the production process; • have developed a differentiated knowledge and a critical awareness in human engineering and work safety.		
Module content	• Objectives in construction and goal oriented choice of key agricultural machinery • procedural strategies • systems of measuring and regulation • process-oriented structuring of technology • issues of location and legal matters in food production • methods and basics of quality management • technical realisation of trade norms • application of quality techniques – quality audit • the physiological bases of human labour • organisation of the workplace – determination of work time – work planning – labour costs		
Form(s) of instruction	Lecture (40%), tutorials (group work) (20%), excursion (40%)		
Total workload in hours.	180	**Credit points:** 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	100 consisting of: lecture: 40, group work: 20, excursion: 40		
Ab Preparation/revision	30 consisting of: lecture: 20, group work: 10		
B Autonomous work	20		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: group work and oral examination Mark: group work (50%), oral examination (50%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	45		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1262/ipz/ipz.html
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09- MK 09 (AÖ)	**Methodological Principles of Agricultural and Foodstuffs Analysis**	**2nd Sem.**	**6 CP**
Module	Methodological Principles of Agricultural and Foodstuffs Analysis		
Module code	MK 09		
Faculty/Chair/ Department	Faculty 09/Agricultural Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agribusiness, Agricultural Economics and Business Management[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • gain a statistical and mathematical understanding for working on quantitative issues; • handle issues of agricultural economics, break those down into smaller models and formulate them appropriately; • gain the ability to apply statistical methods to the description of quantitative relationships; • develop generalizable procedures from specific problems; • are able to portray on a higher level and through comparative statistical methods of sector analysis, a picture of the changing processes in the agricultural and food sector; • will be able to draw on fundamental mathematics for quantitative sector analyses that are necessary for further analysis with sector models.		
Module content	Descriptive methods of business statistics: • collecting, preparing and portraying data • distributive measures for location and diffusion • measuring correlations and hypothesis tests • concentration measurement; instability measurement • ration and index numbers; components of a timeline • calculation and elimination of seasonal patterns measuring comparative advantages and competitiveness • basic forecasting techniques • value added and collecting the sectorial economic performance • input-output analysis, social accounting matrix and sectorial interconnectivity Basic mathematical ideas of sectorial analysis: • applying differential calculus and alteration rates • basic principles of mathematical optimisation for portraying behaviour • mathematical formation of cost functions • mathematically deducing supply functions • mathematically deducing factorial demand functions • determining the basic rent and prices • outlining growth models • solving interdependent systems of equations		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours.	180	**Credit points**: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 45, tutorials: 15		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination: (100%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/iam/pau
Required literature: see Stud.IP and department website

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09-MK 11 (AB)	**Special Biochemistry II**	**2nd or 4th sem.**	**6 CP**
Module	Special Biochemistry II		
Module code	MK 11		
Faculty/Chair/ Department	FB09/Nutritional Biochemistry/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master Agrobiotechnology 1)/2nd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Chemistry , Biochemistry		
Learning outcomes	The students • have in-depth knowledge and proficiency in the application of molecular biology, spectrophotometric and chromatographic methods relevant to the nutritional science; • are experienced and proficient in techniques of protein biochemistry and cell biology; • have knowledge of the qualitative and quantitative value of biochemical, cell-biological, molecular biological, and enzymatic analytic processes		
Module content	• Primer design, PCR, cloning, use of restriction enzymes, ligation • heterologous overexpression of eukaryotic genes, production of recombinant proteins • purification with affinity chromatography, SDS-PAGE analysis • enzyme kinetics • inhibitor studies (linear and non-linear regression) • photometric determination of riboflavin status (EGRAC) and haemoglobin concentration • determination of glutathione concentrations and total antioxidant capacity in biological material • 2-dimensional gel electrophoresis • crystallisation of proteins, x-ray diffraction analysis		
Form(s) of instruction	Seminar (30%), laboratory (70%)		
Total workload in hours	180	**Credit points:** 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60: seminar (20), practical exercise (40)		
Ab Preparation/Revision	70: preparation (30), follow-up study (40)		
B Autonomous work	20: small group work		
Examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended participation	2nd or 4th semester		
Intake capacity	60		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/becker

Required literature: see Stud.IP and department website

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09-MK 13 (AB)	**Risk Assessment, Biosafety and patent Law**	**3rd Sem.**	**6 CP**
Module	Risk Assessment, Biosafety and Patent Law		
Module code	MK 13		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	Master Agrobiotechnology/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have broad knowledge of various processes in the field of technology assessment of agricultural products; • have in-depth knowledge of the structure of the authorising agencies for plant protection products; • are able to explain the structure and the tasks of the different institutions responsible for evaluation of suitability, risk assessment, environment protection, farmer and consumer protection, and food security; • understand the ethic aspects of technology assessment • know fundamental principles of the European Patent Law; are able to understand the evaluation and authorisation procedures for plant protection products according to European Union Council Directives		
Module content	• Development of guidance for the risk management of plant protection products • evaluation of suitability of plant protection products • tasks and structure of the EU Ethic and Food Safety Authority Commission • tasks and structure of the Federal Institute for Consumer Protection and Food Security (BVL) • tasks and structure of the Federal Institute for Risk Assessment (BfR), Environmental Agency (UBA), and Biological Research Centre for Agriculture and Forestry (BBA) • tasks and structure of the European and Mediterranean Plant Protection Organisation (EPPO) • assessment of different strategies in development of pest resistance of cultivated plants: gene technology vs. plant breeding • ecotoxicological studies of side effects of plant protection products (e.g. surface water pollution, effects on beneficial insects, …) Federal and European Patent Law • TA studies on transgenic plants and food • TA studies on environmental problems of agriculture • TA studies on renewable energies • TA and SD studies on agriculture, food chains and food • methods to deal with uncertainty, lack of knowledge and different values and interests • methods to develop different options for action • terms and conditions for organic farming and integrated pest management • release and marketing of genetically modified organisms		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	**Credit points**: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60, lecture: 30, seminar: 30		
Ab Preparation/Revision	90		
B Autonomous Work	-		
C Examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar, each part must be sufficient Mark: seminar (50%) and written examination (50%) Oral or written examination Oral or written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
participation	3rd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: see Stud.IP

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09-MK 15 (AB)	**Plant Protection and Bioengineering**	**1st sem.**	**6 CP**
Module	Plant Protection and Bioengineering		
Module code	MK 15		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	Master of Science Agronomy/1st semester Master of Science Agrobiotechnology/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamental knowledge of plant pathology and molecular biology		
Learning outcomes	The students • can understand and evaluate biotechnological processes involved in plant protection and pest control; • have practical experience with basic biotechnological processes, such as tissue culture, high-throughput screening and marker applications; • have a conception of the field of biotechnology in the area of plant protection; • have a command of the most important transformation techniques in the production of genetically modified plants; • understand the requirements of current plant protection strategies • have contact to leading companies on the field of plant protection		
Module content	• transgenic plants • agronomically significant genes • transformation techniques • biotechnological pest control techniques • tissue techniques and tissue cultures • high-throughput screening methods		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	**Credit points:** 6 ECTS credits	
Module composition: A Course total	180		
Aa Contact hours	60, consisting of: lecture: 30, seminar: 30		
Ab Preparation/Revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar, each part must be sufficient Mark: written examination (50%), seminar (50%) Respective part of examination Oral or written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Recommended participation	1st semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz

Required literature: Buchanan et al. 2000, *Biochemistry & Molecular Biology of Plants (American Society of Plant Biologists)*; Oerke et al. 1994, *Crop Production and Crop Protection (Elsevier)*

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09-MK 16 (AB)	**Biotechnology and Genomics**	**2nd sem.**	**6 CP**
Module	Biotechnology and Genomics		
Module code	MK 16		
Faculty/Chair/Department	Faculty 09/Crop Farming/Institute for Crop Farming and Breeding I		
Associated degree course(s)/Semester taken	Master of Science Agrobiotechnology/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Knowledge of molecular genetics		
Learning outcomes	The students • shall deepen their theoretical knowledge about genome analysis methods, with an emphasis on plant genome mapping and gene expression techniques; • will gain an insight into the practical applications of biotechnological and molecular genetic methods in plant breeding; • will obtain the necessary theoretical background to apply experimental molecular genetics, biotechnological and gene technological methods in plant breeding		
Module content	• Molecular and cellular plant genetics • methods and techniques of experimental biotechnology and genome analysis • molecular plant breeding: Structure and function of plant genomes, molecular markers, genome mapping, QTL analysis, gene cloning techniques, gene expression methodology • methods of gene technology in plant breeding: Gene isolation, gene transfer (transformation techniques), detection methods		
Form(s) of instruction	Lectures (80%) and excursions (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	70 (lectures: 50, excursions: 20)		
Ab Preparation/Revision	60 (lectures: 40, excursions: 20)		
B Autonomous work	50 (lectures: 30, excursions: 20)		
C Final module examination	Written examination (2 hours)		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Examination and homework Examination (80%), Homework (20%) Written examination (2 hours)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/~gh1262/ipz/ipz.html

Required literature: Stud.IP or homepage

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09-MKAB 18	**Microbial Food Biotechnology**	**2nd/4th sem.**	**6 CP**
Module	Microbial Food Biotechnology		
Module code	MK 18		
Faculty/Chair/Department	FB09/Applied Microbiology and Recycling Processes/ Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	Master of Science Agrobiotechnology/2nd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have knowledge of the industrial microbiological processes employed in industrial settings, including genetic engineering applications; • are familiar with advanced application-oriented microbiological methods within the scope of industrial microbiology; • know basic and advanced microbiological and molecular techniques for control purposes		
Module content	• Food fermentations, selected examples: dairy products, wine, beer, fermented vegetables • microbial production systems, vinegar, citric acid, acetone, amino acids as primary products of microbial metabolism • antibiotics, toxins (e.g. as insecticides) as secondary products of microbial metabolism • microbial transformation and biocatalysis • genetic engineering of micro-organisms for optimal production • foodborne pathogenic bacteria, selected examples: salmonella, enterohaemorrhagic bacteria, clostridium • epidemiology of food-borne illness • insects and other vectors for microbial spoilage • inhibition of microbial growth by physical or chemical methods		
Form(s) of instruction	Lecture (50%), practical course (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition A Courses in total	120		
Aa Contact hours	60, lectures: 30, practical course: 30		
Ab Preparation/Revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 2 semester		
Recommended participation	2nd or 4th semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/cms/fbz/zentren/ifz/arbeitsgruppen/kaempfer/?searchterm=Peter%20K%C3%A4mpfer

Required literature: Stud.IP or homepage

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09- MK 19 (AB)	**Industrial Internship**	**3rd sem.**	**12 CP**
Module	Industrial Internship		
Module code	MK 19		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	Master Agrobiotechnology, 3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamental knowledge of laboratory work; fundamental knowledge of chemistry and biology, cores of the 1st and 2nd semester		
Learning outcomes	The students • can understand and evaluate biotechnological processes in food and Agrobiotechnology; • have practical experience with extended biotechnological processes, such as tissue culture, high-throughput screening and marker applications, fermentation; • can execute extended biotechnological laboratory methods unassisted; • have a conception of the problem solution strategies in biotechnology; • have a command of the most important transformation techniques in the production of genetically modified plants/microorganisms; • gain an insight into and broad information on technology and strategies used by food and agrobiotechnology industries		
Module content	• Transgenic plants/microorganisms • agronomically important genes, proteins, and/or other metabolites • genetic transformation techniques • depending on industry laboratory : • biotechnological pest control techniques • biotechnological disease control techniques • tissue techniques and tissue cultures • high-throughput screening methods • molecular breeding techniques • food and feed safety • microbial production techniques • cell biology techniques • visualisation techniques by marker genes		
Form(s) of instruction	Exercises (100%)		
Total workload in hours	360	Credit points: 12 ECTS credits	
Module composition A Courses in total	 120		
Aa Contact hours	18		
Ab Preparation/Revision	102		
B Autonomous work	240		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) Oral examination Oral examination		
Frequency, duration in semesters	No limitation 8 weeks		
Recommended participation	3rd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 20 (EW)	**Special Biochemistry I**	**1st sem.**	**6 CP**
Module	Special Biochemistry I		
Module code	MK 20		
Faculty/Chair/ Department	Faculty 09/Biochemistry of Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science[1)]/Semester 1		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Chemistry Laboratory (BK 43), Biochemistry 1 (BK 06)		
Learning outcomes	The students • have a deep knowledge of the principles of metabolism regulation on a molecular and cellular level; • should be able to discuss how the metabolism of nutrients is regulated at organ level; • know the molecular mechanisms of receptors and signal transduction; • know the interaction between structure and function of enzymes/proteins; • understand immunological processes and their interaction with the environment; and • know the significance of proteome and transcriptome analysis in biochemistry and nutritional science.		
Module content	• Receptors and signal transduction of eukaryotic cells • compartmentalisation of the metabolism with regards to the special functions of the organelles • enzymes (structure, mechanisms of catalysis, inhibition, regulation, linear and non-linear regression, enzyme diagnostics co-enzymes) • chaperones, post-translational modifications, control of objectives of proteins, protein reduction • differential genome and proteome analysis and its evaluation • nucleotide metabolism and its dysfunctions • immunology (complement system allergies and their prevention/treatment, immunological tests) • interaction between nutritional content and genes (e.g. in the case of cancer) • nutrition and infections (mycotic, bacterial, viral, parasitic) apoptosis (cascades, regulation, markers)		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	60 consisting of: preparation: 30, follow-up course work: 30		
B Autonomous work.	30 working in small groups		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (90 min.) Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbzfbr09/institute/ernaehrungswissenschaft/ag/becker
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 21 (NT)	**Molecular Animal Breeding and Biotechnology**	**1st sem.**	**6 CP**
Module	Molecular Animal Breeding and Biotechnology		
Module code	MK 21		
Faculty/Chair/ Department	Faculty 09/Animal Breeding and Domestic Animal Genetics/Institute for Animal Breeding and Domestic Animal Genetics		
Associated degree course(s)/Semester taken	Master of Productive Livestock Science [1]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	B.Sc. agr., BP 46		
Learning outcomes	Students: • have in-depth knowledge of molecular genetic and biotechnological procedures, their evaluation and use in QTL and association analysis and their use in modern breeding programmes for livestock; • know the legal basis of gene technology.		
Module content	• Development and structure of genomes in livestock • mapping procedures, proof and fine mapping of QTLs and identification of candidate genes • methods of genetic diagnosis • gene regulation analysis • procedures for the analysis of phylogeny and diversity • hereditary pathology and pathogenetics • representation and implementation of reproductive techniques • transgen animals • implementation of biotechnology in animal breeding • implementation of and legal basis for gene technology		
Form(s) of instruction	Lecture (90%), seminar (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 54, seminar: 6		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, presentation Mark: written examination (85%), presentation (15%) - Written examination		
Frequency, duration in semesters	Winter semester, annually, 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 22 (HD)	**Everyday Personal Service Provision within a Network of Institutions and Services**	**1st/3rd sem.**	**6 CP**
Module	**Everyday Personal Service Provision within a Network of Institutions and Services**		
Module code	MK 22		
Faculty/Chair/ Department	Faculty 09/Economics of the Private Household and the Family Science/Institute for Household Economics and Consumer Research		
Associated degree course(s)/Semester taken	Master of Household and Service Science [1] /1st/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • are able to consider the range of topics in "Every-day care in a network" from different points of view and to analyse it with an interdisciplinary perspective; • know how to analyse and evaluate the different institutional approaches and network manifestations; • know and understand the different valuations for multidimensional evaluations; • can master multidimensional systems of evaluation.		
Module content	Theories and methods for: • determining required and target group-related arrangements of personal care in group • determining household types and requirement profiles for specific circumstances in every-day care that are under private and public responsibility or in a 3rd sector organising body • the illustration of spatial projections in care arrangements		
Form(s) of instruction	Seminar (60%), tutorials (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition A Courses in total	120		
Aa Contact hours	60 consisting of seminar: 40, tutorial: 20		
Ab Preparation/revision	60 consisting of seminar: 40, tutorial: 20		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation including written report and written examination Mark: presentation including written report (50%), written examination (50%) Further written report Written examination and/or further written report		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://wi.uni-giessen.de/wps/fbr09/home/meier

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 23 (AÖ/UR)	**Methods of Regional Analysis and Planning**	**1st sem.**	**6 CP**
Module	Methods of Regional Analysis and Planning		
Module code	MK 23		
Faculty/Chair/ Department	FB09/Project and Regional Planning/Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	Master of Environmental and Resource Management, Master of Agricultural Economics and Business Management[1)]/1st semester, Master of Transition Management, Geography (Giessen and Marburg)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basics of Regional Planning and Statistical Methods		
Learning outcomes	The students • Understand the necessity for regional and environmental planning in a market system • recognise the necessity and reasons for creating and classifying regions; • master the most important methods for classifying regions; • work with region-analytical ratios to describe regional structures; • apply quantitative methods for the analysis and forecasting of regional developments; • recognise the necessity of evaluation in regional and environmental planning; • assess and evaluate the advantages and disadvantages of different methods of evaluation; • are able to choose and apply adequate methods of evaluation to specific plans.		
Module content	• role of planning in a market economy • the principles of region building and regional groupings • methods of regional classification • statistical ratios in regional analysis • complex indicators for describing regional structures • methods of regional structural analysis • regional models • fundamentals of welfare economics • methods of evaluation • case studies in regional and environmental planning • possibilities and limits of formal evaluation in environmental and regional projects		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture:45, seminar: 15		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component examination Form of retake examination	Form: examination, tutorial work Mark: examination (80%), tutorial work (20%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	English/German		

Homepage http://www.uni-giessen.de/Regionalplan/

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 24 (EW)	**Special Human Nutrition I**	**1st sem.**	**6 CP**
Module	Special Human Nutrition I		
Module code	MK 24		
Faculty/Chair/ Department	FB09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Nutritional Science and Home Economics		
Learning outcomes	The students • can master the basic concepts of developing nutritional recommendations for different groups of people and for groups of different ages; • have acquired competencies for the practical application and evaluation of specific nutritional methods for the evaluation of a person's nutritional state; • have in-depth knowledge of the relationship between body composition, metabolic rate and the energy and nutrition supply; • have in-depth knowledge of the special nutritional requirements in different stages of a person's life; • Can evaluate particular diets from a nutritional point of view.		
Module content	• Development of recommendations and recommendation concepts for the supply of nutrients • methods of measuring nutritional status • methods of determining body composition • methods of measuring food and nutrition supply • methods of measuring the metabolic rate • nutrition in different stages of life as well as during pregnancy and while breast feeding • special diets (diets for weight reduction, vegan diet etc.)		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work.	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar (presentations, tutorials) and examination Mark: performance in seminar (50%), examination (50%) Written examination Seminar and written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 25 (NT)	**Breeding Assessment and Breeding Strategy**	**2nd sem.**	**6 CP**
Module	**Breeding Assessment and Breeding Strategy**		
Module code	MK 25		
Faculty/Chair/ Department	FB09/Animal Breeding and Genetics/Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	Master of Livestock Science [1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	B.Sc. agr., BP 47 (recommended)		
Learning outcomes	The students • can apply genetic evaluation data and estimation of variant components using animal models; • are qualified to assess and optimise pure breeding and cross-breeding programmes		
Module content	• Statistical models: mixed modelling techniques, BLUP animal models; • estimation of random as well as QTL effects for polygeneous traits; • genetic evaluation models including MA-BLUP in agricultural livestock • breeding methods; • planning and evaluating breeding programmes including conservation breeding programmes.		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 45, tutorials: 15		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MKH 26 (HD)	**Household, Family and Consumer Theories**	**1st sem.**	**6 CP**
Module	Household, Family and Consumer Theories		
Module code	MK 26		
Faculty/Chair/ Department	Faculty 09/Economics of the Private Household and Family Studies/Institute for Household Economics and Consumer Research		
Associated degree course(s)/Semester taken	Master of Household and Service Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • understand the different theories of demand-oriented private care from a macro-perspective; • have gained competencies in theories of demand-oriented care in Europe and the USA; • can analyse primary interests in different theories as well as evaluate their significance and practical relevance.		
Module content	• Fundamentals, principles and cognitive interests of private household theory; • the social and personal theory according to von Schweitzer; • comparison of theoretical approaches of different experts in Germany, Europe and the USA in comparison; • microeconomic theoretical approaches and their strengths and weaknesses in explaining the issue; • ecologically sustainable care and gender specific aspects of welfare management; • significance and practical relevance of theories on demand-oriented supply of private households; • the significance of the theories to politics, education and education; • empirical studies based on the theories and practical examples		
Form(s) of instruction	Seminar with tutorials in group work (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation including written report and leading a group discussion in the seminar Mark: presentation (40%), leading discussion (10%), written report (50%) any part of the examination Respective part of the assessment Respective part of the assessment		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://wi.uni-giessen.de/wps/fb09/home/meier
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 27 (UR)	**Soil Conservation and Decontamination**	**1st sem.**	**6 CP**
Module	**Soil Conservation and Decontamination**		
Module code	MK 27		
Faculty/Chair/ Department	Faculty 09/Soil Science and Soil Conservation/Institute for Soil Science and Soil Conservation, Microbiology of Recycling Processes/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	Master of Environment and Resource Management [1)]/1st semester, Diploma in Geography/5th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BKA-04 (Soil Science module), BP 64 (Ecological Soil Functions), BP 70 (Environmental Technology and Environmental Microbiology)		
Learning outcomes	Students: • develop solutions for the protection of soil based on knowledge they have gained on the origins of soil contamination and technical and legal options; • analyse and evaluate, with the aid of case studies, the worthiness of protection, the need for protection as well as strategies for the protection and remediation of soil; • know the extent and problems of former landfills and old industrial sites and fundamental safety and remedial measures (physical, chemical, biological)		
Module content	• Soil resources and principles of soil contamination • soil landscapes in central Europe and their need for protection • type, extent and avoidance of fundamental soil contamination: exploration, collection, comparative evaluation, detailed location analysis of polluted areas and former landfills, remediation measures (physical, chemical, biological) • microbial pollutant reduction, assessment		
Form(s) of instruction	Lecture (67%), seminar (33%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 40, seminar: 20		
Ab Preparation/revision	90 consisting of: lecture: 60, seminar: 30		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar presentation, written examination (90 min) Mark: 1. seminar presentation (30%), 2. written examination (70%) Respective part of the assessment Written examination (90 min)		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/bkbe

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MKE 28 (EW)	**Laboratory Course in Nutritional Physiology**	**1st sem.**	**6 CP**
Module	Laboratory Course in Nutritional Physiology		
Module code	MK 28		
Faculty/Chair/ Department	FB09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	Master of Nutritional Science/Master of Livestock Sciences semester [1]/ 1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • master different methodological approaches and concepts for the investigation of digestive processes, metabolic transportation and the metabolism (energy, nutrients); • gain in-depth knowledge of and skills for analysing nutritional parameters and interpret those in scientific writing.		
Module content	• methods for the analysis of nutrients and the evaluation of nutrients • parameters of the antioxidant metabolism • analysis of chosen minerals, vitamins, carbohydrates, proteins, amino acids and lipids as well as the interpretation of medical statements, glucose tolerance test		
Form(s) of instruction	Laboratory in small groups (90%) with introductory seminar (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: introductory seminar: 6, laboratory: 54		
Ab Preparation/revision	90		
B Autonomous work.	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	90		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 29 (NT)	**Behaviour and Housing of Farm Animals**	**1st sem.**	**6 CP**
Module	Behaviour and Housing of Farm Animals		
Module code	MK 29		
Faculty/Chair/ Department	FB 09/Animal Husbandry and Biology of Husbandry/Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	Master of the science of livestock [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • understand the physiological, ethological principles and principles of animal husbandry biology (cattle, pigs, sheep); • develop an approach to designing areas for livestock husbandry; • are able to organise the production of high-quality food which takes into consideration aspects of animal and environmental protection, as well as a high standard of animal health		
Module content	• Livestock ethology (cattle, pigs, sheep, behaviour disorders) • animal protection in livestock husbandry • procedures in animal husbandry and organisation of production in cattle, pigs and sheep husbandry • management in husbandry of dairy cattle, mother cows, mother sheep, fattened lambs, pregnant and lactating sows, weaned piglets and hogs		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 30 (HD)	**Management of Personal Service and Health Care Institutions**	**2nd sem.**	**6 CP**
Module	Management of Personal Service and Health Care Institutions		
Module code	MK 30		
Faculty/Chair/ Department	Faculty 09 / Management of Services for Persons / Institute for Household Economy and Consumer Research		
Associated degree course(s)/Semester taken	Master of Household and Service Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The Students • can evaluate and classify the personal service and health care industry, • have developed a broad knowledge of the theoretical and methodological issues in the management of personal service institutions, • know the performance-related and financial functions and particularities of personal service institutions, • analytically deduce and solve management problems of personal service institutions, • can apply methodologically and theoretically to personal service institutions.		
Module content	• Objectives and objective systems of personal service institutions • Financing personal service institutions • Accounting and financial statements of personal service institutions • Cost accounting and controlling of personal service institutions • Optimisation of operational decisions using the example of personal service institutions • Economic parameters of personal service institutions		
Form(s) of instruction	Lecture (50%), Seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment and presentation Mark: written assignment and presentation (100%) - Written assignment and presentation		
Frequency, duration in semesters	Summer semester, annually, 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fb09/home/braeunig
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 31 (UR)	**Quantitative Landscape Analysis**	**1st sem.**	**6 CP**
Module	Quantitative Landscape Analysis		
Module code	MK 31		
Faculty/Chair/ Department	Faculty 09/Resource Management/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	Master of Environment and Resource Management [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BKU05 (or other foundation in descriptive statistics)		
Learning outcomes	Students: • can apply methods of measuring important parameters in water supply and landscape mass balance (e.g. rainfall, vaporisation, soil moisture, drainage into bodies of water, surface drainage, erosion); • can assign the results of point measurements to surfaces; • are familiar with GPS techniques		
Module content	• Measuring significant parameters in atmosphere, pedosphere and hydrosphere • methods of regionalisation (geostatistics, interpolation techniques) • issues related to modelling the water supply with a simple precipitation run-off model • GPS-practices		
Form(s) of instruction	Lecture (30%), tutorials (70%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 20, tutorials: 40		
Ab Preparation/revision	30		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: exercises throughout the semester Mark: exercises throughout the semester (100%) - Resubmission of exercises		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	40		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr
Required literature: see Stud.IP and department website

1) . May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 32 (EW)	**General Food Science**	**2nd sem.**	**CP 6**
Module	General Food Science		
Module code	MK 32		
Faculty/Chair/ Department	Faculty 09/Food Technology/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science [1]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • know about the most important food groups, how they are obtained from the respective raw plant material and their ingredients; • know the significance, purpose and technological methods of handling and processing the food; • know methods for eliminating of unwanted compounds; • have a differentiated knowledge of the chemical changes taking place in the food handling process; • have knowledge of the processing and microbiology of milk and dairy products; • have knowledge of the composition, processing and hygienic treatment of beef, pork, fowl, fish and game.		
Module content	• Grain and the ingredients of grain, bread and yeast, Maillard reaction and, legumes and their ingredients, soy products, pectines among others and thickeners, plant pigments (carotenoids, betalaines), vegetable fat and oils and their processing and usage (refinement, fractioning, hydration), margarine production, decomposition of fat, origin, ingredients and technology of luxury foods (coffee, cocoa, tea) and spices (vanilla, cinnamon, pepper, and others), food vinegar and mustard alcoholically fermented foods (beer, wine) cane sugar and beet sugar, sweeteners • production, processing and treatment of milk, ingredients of milk, hygiene of raw milk, pasteurised and UHT-milk, health issues relevant to the hygiene of dairy products. • food monitoring, official investigations (hygiene of meat, statistics), legal background: definitions, composition, quality markers (rigor mortis) and lack of quality (post-mortem changes, PSE/DFD syndromes, pathogenic microorganisms) in meat/products; technology of raw, pre-cooked and boiled sausages (heating, drying, salting, pickling, smoking, start cultures);fish/products and egg/products (if possible in the given time frame!)		
Form(s) of instruction	Lecture (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (90 min.) Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/food
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 33 (NT)	**Physiology of Performance**	**1st sem.**	**6 CP**
Module	Physiology of Performance		
Module code	MK 33		
Faculty/Chair/ Department	FB 09/Animal Husbandry and Biology of Husbandry/Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	Master of Livestock Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • understand the physiology of reproduction as a prerequisite for influencing reproduction; • can organise the controlling of reproduction; • have optimal control over the course of growth based on physiological contexts; • possess differentiated knowledge and a critical awareness of the skills for animal exercise management; • can organise the upbringing of young animals.		
Module content	• anatomy and physiology of reproduction • zoo-technical and bio-technological reproduction management • management of in-vitro fertilisation • anatomy and physiology of growth • animal exercise management • bioclimatology • thermal efficiency in stables		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, tutorials: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

MKH 35	**Social Services**	**1st sem.**	**6 CP**
Module	Social Services		
Module code	BP B 03		
Faculty/Chair/ Department	FB 09/Health and Social Politics/Institute for Household Economics and Consumer Research		
Associated degree course(s)/Semester taken	Master of Household Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	none		
Learning outcomes	The students • are familiar with the particulars of domestic personal and social welfare services, • have knowledge of processes and problems of governing and controlling as well as issues of democracy and participation in this area, • are acquainted with interaction concepts with users and households as citizens, customers and co-producers and can assess these concepts, • are familiar with the different social welfare services institutions and their distinctive principles.		
Module content	• theorems of services and the service economy • organisation and law in central service areas (child day care, old age care, domestic services) • concepts of governing, controlling and financing in the area of social services • concepts of service organisations: case management, networking, etc. • problems and tendencies in the practical application of the service areas mentioned above		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work in the module	30		
C Final module examination	30		
Form(s) of assessment and contribution to final mark Form of module component retake examination Form of module retake examination	Form: presentation on seminar work, project, written assignment Mark: written assignment, presentation on seminar work (25%), assessment of project in latter stages of module (25%) Written examination Written examination		
Frequency, duration	Winter semester, annually, 1 semester		
Intake capacity	unlimited		
Language	German		

Homepage: http://wi.uni-giessen.de/wps/f09/home/evers/
Required literature: see Stud.IP or homepage of institute

1) May also be selected by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 36 (UR)	**Environmental Chemistry**	**2nd sem.**	**6 CP**
Module	Environmental Chemistry		
Module code	MK 36		
Faculty/Chair/ Department	Faculty 09/Waste and Resource Management/Institute for Landscape Ecology and Resource Management, Soil Science and Soil Conservation/Institute for Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	Master of Environmental and Resource Management, Master of Viticulture and Oenology[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the composition of the environment compartments water, soil and air; • know the qualities and behaviour of environmental substances in these media; • are familiar with environmental legislation in the area of substance related pollution.		
Module content	Lecture: • main points of environmental legislation • discussion on the environmental compartments air, soil and water and their current condition • pollutants and classes of pollutants: behaviour in the environment Practical exercise: • current issues and techniques of substance properties and environmental analysis		
Form(s) of instruction	Lecture (80%), practical exercise (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 48, tutorials: 12		
Ab Preparation/revision	90: consisting of: lecture: 72, tutorials: 18		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (30 min) Mark: oral examination (100%) - Oral examination (30 min)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 37 (EW)	**Pathophysiology and Nutritional Medicine**	**2nd sem.**	**CP 6**
Module	Pathophysiology and Nutritional Medicine		
Module code	MK 37		
Faculty/Chair/ Department	Faculty 09/Human Nutrition, International Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science [1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Special Human Nutrition I (MK 37), BP 78 recommended		
Learning outcomes	Students: • have knowledge of aetiology, pathophysiology, clinic and the course of nutrition-related diseases; • are familiar with treatment principles and prevention of nutrition-related diseases; • can work out the parameters of nutrition-related diseases with the help of an actual case study.		
Module content	• Artificial nutrition, enteral and parenteral, • nutrition-related diseases during infancy • nutrition (prevention and supportive therapy) • congenital and acquired metabolic disorders • gastrointestinal diseases, especially colonic inflammatory diseases • hepatic, gall bladder and pancreatic diseases • diabetes mellitus, disease management strategies, 'self-care' • kidney and immune system diseases • rickets and osteoporosis, prevention and management • eating disorders, established treatment concepts		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30; seminar: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar presentation Mark: written examination (50%), seminar presentation (50%) Written examination Written examination or oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	120 participants		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/int-nutr/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 39 (EÖ)	**Food Quality: Coordination, Decision-making and Institutions**	**2nd sem.**	**6 CP**
Module	Food Quality: Coordination, Decision-making and Institutions		
Module code	MK 39		
Faculty/Chair/ Department	Faculty 09/Agricultural Policy/Institute for Agricultural Policy and Market Research and Department of Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Agricultural Economics and Business Management[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • learn that food quality is an issue of coordination and decision-making; • realise the industrial and societal efforts necessary to ensure a certain degree of quality; • gain methodological knowledge of the relationship between institutions and quality assurance; • understand how human behaviour is controlled in a sector-specific context and how regulations can be explained economically; and • learn to recognise the interaction between the individual (company) and society (politics) and also learn how to apply methodological institutional economic approaches to find cooperative solutions.		
Module content	• Coordination as a societal and company-specific problem in the food chain • action theory and social theory • food quality as a social coordination problem • food safety as a public good • core factors of coordination, cooperation institutional economics • efficient institutional and organisational forms • rights of disposal and exchange • private versus state coordination • solution strategies, decision improvements and inspection • conduct arrangements, reciprocity • state control and intensity of control vs. private arrangements • self-control and communication • investments in control mechanisms and systems		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	110		
Aa Contact hours	60 consisting of: lecture:45, tutorial: 15		
Ab Preparation/revision	50		
B Autonomous work	40 (presentation)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination and seminar presentation Mark: oral examination (60%) and presentation (40%) Respective part of the examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/iam/pau

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 40 (HD)	**Socioeconomics of Private Households**	**1st sem.**	**6 CP**
Module	Socioeconomics of Care in Private Households		
Module code	MK 40		
Faculty/Chair/ Department	Faculty 09/Household and Family Science/Institute for Household Sciences		
Associated degree course(s)/Semester taken	Master of Household and Service Science [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • are familiar with care theories for private households from a microperspective and also know how to evaluate cognitive interests, informational value and practical relevance; • can apply methods of household analysis and household simulation; • can interpret data for the evaluation of living conditions in private households; • can classify methods in the context of care research, specialist political consultancy, socio-economic consultancy on individual cases and household education.		
Module content	• Personal and social theory of household behaviour • decision-making and resource theories • Objectivised description of every-day care for different types of households (household analysis) • Calculation and interpretation of private care ratios in order to identify problems or rather identify a care requirement (household diagnosis) • Investigation of alternative ways of preparing for certain life events and solving problems and their consequences for the household system (household simulation)		
Form(s) of instruction	Seminar (60%), group work (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: seminar: 36, group work: 24		
Ab Preparation/revision	60 consisting of: seminar: 30, group work: 30		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: household analysis (data collection and evaluation), household simulation (presentation and written report) Mark: household analysis (40%), household simulation (60%) Respective part of the examination Respective part of the examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fb09/home/meier
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module.

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 41 (UR)	**Ecology of Agricultural Landscapes**	**2nd sem.**	**6 CP**
Module	Ecology of Agricultural Landscapes		
Module code	MK 41		
Faculty/Chair/ Department	Faculty 09/Landscape Ecology/Landscape Ecology and Landscape Planning/Chair of Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	Master of Environmental Management[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • possess in-depth knowledge of the functions, structures and dynamics of agricultural landscapes and their ecosystems; • can recognise the economic and ecological relationships which lead to different types of agricultural landscapes; • know the biotic components of agricultural ecosystems and are able to assess these qualitatively and quantitatively; • know the relationships between environmental factors, land use, landscape structure, landscape dynamics and biological diversity; • recognise areas of conflict between environmental protection and land use and are able to derive measures for the ecological improvement of agricultural landscapes		
Module content	• Functions, structures and dynamics of Central European agricultural landscapes und their ecosystems • Vegetation of the different biotopes in agricultural ecosystems • Effects of traditional and modern land use on the biological diversity of agricultural landscapes • Recognising the relationships between landscape structure, dynamics and phytodiversity on different spatial and temporal scales • Recognising synecological relationships between vegetation and soil • Interpreting driving factors of phytodiversity in agricultural landscapes • Landscape ecological assessment		
Form(s) of instruction	Lecture (40%), seminar (20%), tutorial (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	135		
Aa Contact hours	60 consisting of: lecture: 24, seminar: 12, tutorials: 24		
Ab Preparation/revision	75: consisting of: lecture: 50, training protocols, herbarium: 25		
B Autonomous work	15: seminar presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, training protocols, herbarium, seminar presentation Mark: oral examination (40%), seminar (20%), tutorials (40% consisting of: 20% protocols, 20% herbarium) Respective part of the examination Respective part of the examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 42 (EW)	**Nutrition and Metabolism**	**1st sem.**	**6 CP**
Module	Nutrition and Metabolism		
Module code	MK 42		
Faculty/Chair/ Department	Faculty 09/Human Nutrition and Nutritional Assessment of Food/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science[1)], 1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Biochemistry and the Physiology of Food		
Learning outcomes	Students: • possess in-depth knowledge of the most important parameters influencing the intake and bioavailability of nutrients; • have developed an understanding of the metabolism and regulation mechanisms of the human organism in relation to food intake; • can interpret biomarkers to assess preventive and therapeutic nutritional strategies; • possess the ability to independently prepare a selected topic, produce a paper and present the topic.		
Module content	• Metabolism and functions of macronutrients and micronutrients with a specific focus on the latest literature • interaction of chosen nutrients in intermediary metabolism • metabolic characteristics of organs • reactions of the organism to the food supply or rather meals • influence of nutrition on the immune functions • defective regulations as a precursor of diseases		
Form(s) of instruction	Lecture, including discussion (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30; seminar: 30		
Ab Preparation/revision	60		
B Autonomous work	30 (work in small groups)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment and written examination Mark: written assignment (25%) and examination (75%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fbo09/institute/ernaehrungswissenschaft/ag/kunz
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

MK 43 (NT)	**Animal Nutrition, Product Quality and Environment**	**2nd sem.**	**6 CP**
Module	Animal Food, Product Quality and the Environment		
Module code	MK 43		
Faculty/Chair/ Department	Faculty 09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	Master of Livestock Science [1)]/ 2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • Have knowledge of nutritional influences on the quality of food of animal origin; • Have knowledge of the effect of nutrition on the release of ecological relevant nutrients and gases in monogastric animals and ruminants		
Module content	• The influence of nutrition on the quality of foods of animal origin (milk, meat, eggs) • efficiency of nutrient transformation • food competition between humans and animals • nutrition of livestock with respect to ecological aspects • seminar on particular topics on animal nutrition		
Form(s) of instruction	Lecture (75%), seminar (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 45, seminar: 15		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition/
Required literature: see Stud.IP and department website
May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 45 (EÖ)	**Advanced Market Theory**	**2nd sem.**	**6 CP**
Module	Advanced Market Theory		
Module code	MK 45		
Faculty/Chair/ Department	Faculty 09/Market Theory/ Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Agricultural Economics and Business Management, Wine Business[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • can master microeconomic methods for analysing imperfect markets; • can represent theoretical and empirical concepts for measuring market power; • can demonstrate the meaning of imperfect competition in agricultural and nutritional economic markets; • can identify, localise and evaluate advanced literature about current topics in market theory and furthermore summarise the current level of research in a presentation and present it.		
Module content	Analysis of market activity: • microeconomic methods for the analysis of imperfect markets (game theoretical methods); • theoretical and empirical methods for determining market power; • pricing in imperfect markets with alternative forms of markets (monopolistic competition, oligopoly, oligopsony, partial monopoly); • methods of experimental economic research and its application in price formation in market institutions (auctions); • non-price-related competitive strategies by companies in imperfect markets: quality, innovation and capacity competition • analyses of case studies from agricultural and agribusiness on methodological concepts. Seminar on market theory: Presentation and critical discussion of student presentations on current and important matters in market theory. Recent topics of this seminar included matters of liberalisation in the global agricultural trade, the introduction of biotechnology into the production and processing of food, methods of pricing in the food industry, the introduction of shop closing times or labelling of organic foods.		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	100		
Aa Contact hours	60 consisting of: lecture:30, tutorial: 30		
Ab Preparation/revision	40		
B Autonomous work	50, written assignment		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, written assignment Mark: written examination (50%), seminar (written assignment) (50%) Written examination (50%), written assignment (50%) Written examination (50%), written assignment (50%)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1313/apopr1.htm

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 47 (EW)	**Research Methods in Nutrition**	**2nd sem.**	**6 CP**
Module	Research Methods in Nutrition		
Module code	MK 47		
Faculty/Chair/ Department	Faculty 09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Nutritional Science and Home Economics		
Learning outcomes	Students: • have the knowledge and skills for the statistical planning of complex experiments, graphical and numerical processing of multivariate data and the inferential statistical evaluation of complex data; • have an overview of the principles and significance of different methods in nutritional research; • learn how to deal with different study designs and their respective advantages and disadvantages; • have knowledge of the application of selected experimental techniques.		
Module content	• Revision of the fundamentals and principles of applied statistics • dimensions of association and distance • composition and evaluation of multifactorial experiments and studies • application of statistical programme packages • issues and principles of epidemiological, clinical, animal tested, biochemical and molecular biological studies • issues and principles of experimental techniques and their possible application in nutritional research. Suitable biochemical markers, use of stable isotopes, RIA, ELISA, hybridisation and PCR techniques and others.		
Form(s) of instruction	Lecture (50%), tutorials with practical computer exercises (25%), seminar with demonstrations and tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: weekly exercises, written examination Mark: written assignments accompanying the module (50%), final written examination (50%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition/

Required literature: see Stud.IP and department website

1) May be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 45 (EÖ)	**Advanced Market Theory**	**2nd sem.**	**6 CP**
Module	Advanced Market Theory		
Module code	MK 45		
Faculty/Chair/ Department	Faculty 09/Market Theory/ Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Agricultural Economics and Business Management, Wine Business[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • can master microeconomic methods for analysing imperfect markets; • can represent theoretical and empirical concepts for measuring market power; • can demonstrate the meaning of imperfect competition in agricultural and nutritional economic markets; • can identify, localise and evaluate advanced literature about current topics in market theory and furthermore summarise the current level of research in a presentation and present it.		
Module content	Analysis of market activity: • microeconomic methods for the analysis of imperfect markets (game theoretical methods); • theoretical and empirical methods for determining market power; • pricing in imperfect markets with alternative forms of markets (monopolistic competition, oligopoly, oligopsony, partial monopoly); • methods of experimental economic research and its application in price formation in market institutions (auctions); • non-price-related competitive strategies by companies in imperfect markets: quality, innovation and capacity competition • analyses of case studies from agricultural and agribusiness on methodological concepts. Seminar on market theory: Presentation and critical discussion of student presentations on current and important matters in market theory. Recent topics of this seminar included matters of liberalisation in the global agricultural trade, the introduction of biotechnology into the production and processing of food, methods of pricing in the food industry, the introduction of shop closing times or labelling of organic foods.		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	100		
Aa Contact hours	60 consisting of: lecture:30, tutorial: 30		
Ab Preparation/revision	40		
B Autonomous work	50, written assignment		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, written assignment Mark: written examination (50%), seminar (written assignment) (50%) Written examination (50%), written assignment (50%) Written examination (50%), written assignment (50%)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1313/apopr1.htm
Required literature: see Stud.IP and department website

2) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 46 (UR)	**Microbial Ecology**	**2nd sem.**	**6 CP**
Module	Microbial Ecology		
Module code	MK 46		
Faculty/Chair/ Department	Faculty 09/General and Soil Microbiology/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	Master of Environmental and Resource Management, Oenology[1)]/ 2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamental knowledge of microbiology		
Learning outcomes	Students: • gain a differentiated knowledge of the ecological functions of microorganisms and are able to understand their structure and functional relationships; • understand the phylogenetic classification of microorganisms and are able to interpret genealogical trees; • can apply techniques of microbiological ecology and are also able to interpret their results; • can use their knowledge about the interactions of microorganisms with higher organisms to develop new ideas and methods for understanding those interactions; • develop ideas about exploratory approaches in microbial ecology; • can evaluate and understand original and review articles from pertinent international magazines		
Module content	• Key issues in molecular and microbial ecology • structure and function of microorganisms in natural and anthropogenous influenced habitats • deepened knowledge of the phylogeny and taxonomy of microorganisms • methods of molecular and microbial ecology for identifying microorganisms at a natural location • an idea of the communities in aquatic and terrestrial habitats		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	70: consisting of: lecture: 40, seminar: 30		
B Autonomous work	20		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar presentation Mark: written examination (70%), seminar presentation (30%) Respective part of the examination Written examination or seminar presentation		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	45		
Language of instruction	German		

Module guidance: see semester noticeboard
Term: see timetable
Recommended literature: see semester noticeboard

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 47 (EW)	**Methods in Nutritional Research**	**2nd sem.**	**6 CP**
Module	Methods in Nutritional Research		
Module code	MK 47		
Faculty/Chair/ Department	Faculty 09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science[1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Nutritional Science and Home Economics		
Learning outcomes	Students: • have the knowledge and skills for the statistical planning of complex experiments, graphical and numerical processing of multivariate data and the inferential statistical evaluation of complex data; • have an overview of the principles and significance of different methods in nutritional research; • learn how to deal with different study designs and their respective advantages and disadvantages; • have knowledge of the application of selected experimental techniques.		
Module content	• Revision of the fundamentals and principles of applied statistics • dimensions of association and distance • composition and evaluation of multifactorial experiments and studies • application of statistical programme packages • issues and principles of epidemiological, clinical, animal tested, biochemical and molecular biological studies • issues and principles of experimental techniques and their possible application in nutritional research. Suitable biochemical markers, use of stable isotopes, RIA, ELISA, hybridisation and PCR techniques and others.		
Form(s) of instruction	Lecture (50%), tutorials with practical computer exercises (25%), seminar with demonstrations and tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: weekly exercises, written examination Mark: written assignments accompanying the module (50%), final written examination (50%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition/
Required literature: see Stud.IP and department website

2) May be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 48 (NT)	**Special Nutrition Physiology**	**2nd sem.**	**6 CP**
Module	Special Nutrition Physiology		
Module code	MK 48		
Faculty/Chair/ Department	Faculty 09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	Master of Livestock Science [1)]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • know the regulation mechanism for food intake and satiation of different animal species; • possess in-depth knowledge of nutrient energy recovery for conservation and performance functions and leading concepts of the factorial approach; • have a differentiated knowledge of biochemical functions, deficiency symptoms and recommendations for the supply of major minerals, micronutrients and vitamins; • know the mechanisms and principles for the use of additives and agents.		
Module content	• Food intake regulation for ruminating animals and monogastrics • energy metabolism and exercise physiology • major minerals and micronutrients • vitamins and substances with similar effects • additives and agents		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: guided tutorials: 45, guided tutorials: 15		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition/.
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 49 (EÖ/HD)	**Corporate Communication**	**1st sem.**	**6 CP**
Module	Corporate Communication		
Module code	MK 49		
Faculty/Chair/ Department	Faculty 09/Rural Sociology/Institute for Rural Sociology and Extension		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Household and Service Science [1)]/ 1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • know and apply models and forms of group communication ; • know the principles of group dynamics and group communication; • know moderation and mediation concepts; • have developed their own group moderation concepts and practised those in a tutorial situation; • can assess group situations and develop and apply appropriate working concepts; • can work effectively as team leaders.		
Module content	• Internal and external corporate communication • Information and communication as production factors • Group social psychology, organisational psychology • Corporate and group communication and problem-solving • Concepts of cooperation, negotiation and conflict-solving • Group moderation and mediation • Consumer communication, risk communication • Training on work methods in moderation and mediation		
Form(s) of instruction	Lecture (66%), tutorials and tutorial (34%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture:40, tutorial: 20		
Ab Preparation/revision	90 consisting of: lecture:45, tutorial: 45		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and Contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, training protocol Mark: written examination (75%), training protocol (25%), Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	90		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/kub/
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 50 (AÖ/EÖ)	**Decision-making an Planning Methodology in the Agro-Food Industry**	**1st sem.**	**6 CP**
Module	Decision-making an Planning Methodology in the Agro-Food Industry		
Module code	MK 50		
Faculty/Chair/ Department	Faculty 09/Farm Management/Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	Master of Agricultural Economics [1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can apply appropriate methods for analysing the relations between production and consumers in the provision of goods and services in agricultural and agribusiness; • can independently illustrate and solve relevant production and consumer decision problems on the basis of these methods and with the aid of prescriptive and descriptive decision-making ; • master the techniques and processes of production management.		
Module content	• Criteria for rational decision processes • structure of corporate decision problems • prescriptive and descriptive decision theories • development of utility and preference functions • intertemporal evaluation and preference; time and risk preferences for corporate and consumption • formal and application-orientated approaches to instability and probability • discussion of the phenomena of behavioural finance in corporate and consumer-relevant decisions • Methods of risk analysis and measurement; instruments and processes of risk management		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture:45, tutorials: 15		
Ab Preparation/revision	60 consisting of: lecture:25, tutorials: 35		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and Contribution to final mark Form of module-component retake examination Form of retake examination	Written examination or final written examination Mark: modular examinations (100%) or mark from the final written examination (100%) – Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Term: see timetable

Recommended literature: see semester noticeboard

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 51 (UR)	**Site evaluation for Land use and Nature conservation**	**1st sem.**	**6 CP**
Module	Site evaluation for Land use and Nature conservation		
Module code	MK 51		
Faculty/Chair/ Department	Faculty 09/Soil Science and Soil Conservation/Institute for Soil Science and Soil Conservation, Landscape Ecology and Landscape Planning/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	Master of Environmental and Resource Management [1)]/1st semester, Geography Diploma/7th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • possess the ability to independently conduct location assessments and to evaluate them critically; • can apply location assessments methods; • understand the measures for species protection and communities/ecosystems and are also able to justify these measures.		
Module content	• Techniques for location evaluation (traditional and modern evaluation methods; evaluating relief as a location factor; evaluating soil functions; evaluating climactic influence; evaluating the suitability of usage; evaluation of soil in the consolidation of farming; assessment of locations in landscape planning, recultivated locations, soil density etc.) • Fundamental principles of environmental protection, objects of evaluation in environmental protection, efficiency control specific to environmental protection • practical evaluation of locations		
Form(s) of instruction	Lecture (50%), seminar (25%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 15, tutorials: 15		
Ab Preparation/revision	70: consisting of: lecture: 30, seminar: 20, tutorials: 20		
B Autonomous work	20		
C Final module examination	30		
Method(s) of assessment and Contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation and participation in seminar, tutorial protocols, written examination Mark: tutorial protocols (50%), written examination (50%) Respective part of the examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/bkbe/

Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 52 (EW)	**Nutritional Behaviour and Communication**	**1st sem.**	**6 CP**
Module	Nutritional Behaviour and Communication		
Module code	MK 52		
Faculty/Chair/ Department	Faculty 09/Nutrition Education and Consumer Behaviour/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	Master of Nutritional Science, 1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can work out, with the help of theoretical models and empirical studies, the socioeconomic, psychosocial and cultural determinants in relation to eating and drinking; • can distinguish the disciplinary points of view and work methods in nutritional sociology, nutritional psychology and socio-economic behavioural science; • recognise the behaviour-oriented approaches to communication and education based on behavioural scientific criteria; • can apply methods for surveying human nutrition according to the specific problem at hand and to evaluate their validity; • master behavioural analysis both in theory and practice; • are able to classify and illustrate process models for education, supervision and therapy.		
Module content	• Data about food usage and consumption (food balance sheets), usage of statistics, national/ international household budget data, market research studies, and national/international epidemiological studies on nutrition and health • eating habits, nutritional behaviour and eating disorders • information and knowledge as cognitive determinants • behavioural analysis and behavioural modification • nutrition as a psychosocial phenomenon: approaches to a behaviour theoretical framework for communication, nutrition and health education • models and concepts for changing behaviour in social psychology • education, supervision, therapy, evaluation		
Form(s) of instruction	Lecture (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of lecture		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination: (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/ebvv
Required literature: see Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 53 (EÖ/H+D)	**Process Engineering in Food and Service Enterprises**	**1st sem.**	**6 CP**
Module	Process Engineering in Food and Service Enterprises		
Module code	MK 53		
Faculty/Chair/ Department	Faculty 09/Process Technology in Food and Service Facilities/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	Master of Agribusiness, Master of Household and Service Science [1)]/ 1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Formally none; the content of BP 27 is considered a prerequisite		
Learning outcomes	The students • know scientifically-grounded unit operations of process technology in food and service facilities; • have a broad knowledge of thermodynamics; • know the basic food technological processes and the elements of energy and substance transfer belonging to it; • can employ demanding system theoretical considerations to technical processes, successfully finalise them; and • are also able to scientifically justify and complete a comparative evaluation of alternative processes with regards to technical, economic and ecological factors.		
Module content	• Thermodynamic variables of state, maintenance and transfer • thermodynamics of circular processes including their illustration on a p/V and log p/H diagram • basic operations of thermal and mechanical process engineering (unit operations) • refrigeration and heat engineering including cooking processes • technical hygiene management according to HACCP • technical environmental and energy management		
Form(s) of instruction	Lecture (70%), tutorials (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture:40, tutorials: 20		
Ab Preparation/revision	60 consisting of: lecture:40, tutorials: 20		
B Autonomous work	30 (written assignment with presentation)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment with presentation; written examination or oral examination (depending on intake) Mark: written assignment with presentation (50%), written examination or oral examination (depending on intake) (50%) Written examination or oral examination (depending on intake) Written examination or oral examination (depending on intake)		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 55 (UR)	**Applied Statistics and Environmental Informatics**	**1st sem.**	**6 CP**
Module	Applied Statistics and Environmental Informatics		
Module code	MK 55		
Faculty/Chair/ Department	Faculty 09/Biometry and Population Genetics/Institute for Agronomy and Plant Breeding 2		
Associated degree course(s)/Semester taken	Master of Environmental and Resource Management[1)]/Master of Agrobiotechnology/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basics of biostatistics		
Learning outcomes	The students • can statistically plan complex experiments; • can graphically and numerically prepare multivariate data; • can evaluate complex data using inferential statistics.		
Module content	• Measures of association and distance • preparation and valuation of multifactorial tests • cluster analysis • variogram analysis and kriging procedure • covariance analysis • multiple regression • discriminant and main component analysis • use of statistical software packages		
Form(s) of instruction	Lecture (50%), tutorials with practical work on the computer (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, tutorials: 30		
Ab Preparation/revision	60		
B Autonomous work	30: (completing exercises in the tutorials)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: weekly assignments, written examination Mark: tutorials (30%), written examination (70%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	20, otherwise exercises in parallel courses		
Language of instruction	German and English		

Homepage: http://www.uni-giessen.de/fbr09/biometrie

Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 56 (PP)	**Plant Breeding and Seed Science**	**1st sem.**	**6 CP**
Module	Plant Breeding and Seed Science		
Module code	MK 56		
Faculty/Chair/ Department	FB09/Crop Farming/Institute for Crop Farming and Breeding I		
Associated degree course(s)/Semester taken	Master of Agronomy [1]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • possess in-depth knowledge of the botanical and genetic issues for general and specific breeding of significant agricultural plants; • master the most important classical methods of breeding; • possess a broad knowledge of the use of molecular-biological, biotechnological and gene technological methods in plant breeding; • know the general and specific aims and strategies of plant breeding; • can perform tests on seeds with methods in keeping with international regulations (ISTA); • possess a differentiated knowledge of seed transfer and the law for the protection of the different sorts of seeds, • are informed about the minimal requirements, limit values und test methods according to the international legislation on seeds; • can recognise the distinguishing features of wild and cultivated forms of the most important types of plants; • know the specific features for recognising and classifying seeds from all the most important types of cultivated plants; • have certain expectations for the quality of seeds.		
Module content	• Imparting general and specific botanical knowledge of plant breeding • Implementation of the classical and modern methods of plant breeding • Imparting general aims and aims specific to particular species in plant breeding • Testing the quality of seeds by the standards according to ISTA regulations • identifying wild forms of different kinds of crop • Determining the forms and types of seeds from all significant cultivated plants and special cultures, commenting on questions of quality • The qualitative features of potatoes and beets; identifying the different kinds • Molecular-biological methods for differentiating between the different sorts.		
Form(s) of instruction	Lecture (40%), tutorials (60%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture:24, tutorials: 36		
Ab Preparation/revision	60 consisting of: lecture:20, tutorials: 40		
B Autonomous work	30 consisting of: lecture: 20, tutorials: 10		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, practical test (each part with a mark of at least “sufficient”) Mark: written assignment (30%), practical test (30%), oral examination (40%) Respective part of the examination Seminar, practical test, oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.plantbreeding-giessen.de

Required literature: see Stud.IP and department website

[1] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 57 (AB/PP)	**Molecular Phytopathology**	**1st sem.**	**6 CP**
Module	Molecular Phytopathology		
Module code	MK 57		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	Master of Science Agronomy/1st semester Master of Science Agrobiotechnology/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the biochemical and molecular foundations on host-parasite interactions; • are able to describe the structure and function of resistance and avirulence genes; • are able to discuss possible means by which plants and their parasites coevolved; • are able to describe mechanisms of disease resistance on biochemical and molecular-biological levels; • have an understanding of the modern strategies used in pest control and breeding research.		
Module content	• Cytological, biochemical and molecular-biological foundations on host parasite reactions • mechanisms of plant defensive reactions • structure and function of resistance, avirulence and defensive genes • Principles of modern pest control processes on the basis of induced resistance and genetic engineering techniques • mechanisms of function of active agents: (resistance inductors) • antagonism • pathogenesis factors • elicitors, suppressors • parasite effectors		
Form(s) of instruction	Lecture (75%), seminar (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60, consisting of: lecture: 45, seminar: 15		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, pre-exam, seminar, each part must be sufficient Mark: written examination (50%), pre-exam + seminar (50%) Respective part of examination Oral or written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Recommended participation	1 semester		
Intake capacity	60		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/fbr09/ipaz/home.html
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 58 (PP)	**Nutrition Physiology of Agricultural Crops**	**1st sem.**	**6 CP**
Module	Nutrition Physiology of Agricultural Crops		
Module code	MK 58		
Faculty/Chair/ Department	FB09/Plant Nutrition/Institute for Plant Nutrition		
Associated degree course(s)/Semester taken	Master of Agronomy [1]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BKA 24 in Plant Nutrition		
Learning outcomes	The students • possess specialist and methodological knowledge in the field of the mechanisms and functions of plant nutritional physiology; • are able to solve physiological problems of plant nutrition with the aid of scientific methods.		
Module content	• acquisition and translocation of plant nutrients • transport of ions through biological membranes • functions of plant nutrients • diagnosis of malnutrition		
Form(s) of instruction	Lecture (50%), seminar (25%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30 (tutorials, presentation)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, participation and presentation Mark: oral examination (50%), participation (25%) and presentation (25%). Prerequisite for passing this module is passing the oral examination. Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	35		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/plant-nutrition

Required literature: Schubert, S.: *Pflanzenernährung, Grundwissen Bachelor, Verlag Eugen Ulmer, Stuttgart 2006*

[1] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 59 (PP)	**Biochemistry in Plant Production**	**1st sem.**	**6 CP**
Module	Biochemistry in Plant Production		
Module code	MK 59		
Faculty/Chair/ Department	FB09/Biochemistry of Plant Nutrition/Institute for Plant Nutrition		
Associated degree course(s)/Semester taken	Master of Agronomy [1]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the key biochemical processes in agronomy; • can retrace problems of plant nutrition, phytopathology and plant breeding on a molecular basis; • master the implementation of biotechnological procedures.		
Module content	• energy metabolism • carbon assimilation • nitrogen assimilation • sulphur assimilation • genetic aspects of biochemistry • enzyme kinetics and enzyme regulation • signal chains • carbohydrate metabolism • lipid metabolism		
Form(s) of instruction	Lecture (50%), seminar (20%), tutorials (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 10, tutorials: 20		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German /English		

Homepage: http://www.uni-giessen.de/plant-nutrition/
Required literature: see Stud.IP and department website

[1] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 60 (PP)	**Grassland Ecology**	**2nd sem.**	**6 CP**
Module	Grassland Ecology		
Module code	MK 60		
Faculty/Chair/ Department	FB09/Landscape Ecology and Landscape Planning/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	Master of Agronomy 1st/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the relationships between the grassland system, environmental condition and land use and are also able to understand the scientific context; • can classify grassland types according to their site conditions, land use options and ecological value; • can autonomously prepare an expert survey concerning the value of a grassland stand with respect to fodder quality and ecological value.		
Module content	• Ecological features of grassland plants • methods of documenting the stocks of grassland and their analysis • natural grassland • development of cultivated grassland • plant communities in cultivated and extensive grassland in Central Europe • multifunctionality in grassland use • Production ecology • interactions between grassland plant species composition and fodder value • field trip for assessing the productive and ecological value of grassland • preparation of an expert survey		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, tutorials: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, herbarium, preparation of a written assignment Mark: written examination (50%), herbarium (25%), written assignment (25%) Respective part of the examination Respective part of the examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/ilr
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 61 (PP)	**Cultivation Techniques in Agronomy**	**2nd sem.**	**6 CP**
Module	Production Techniques in Agronomy		
Module code	MK 61		
Faculty/Chair/ Department	FB09/Agronomy/Institute for Agronomy and Plant Breeding I		
Associated degree course(s)/Semester taken	Master of Agronomy [1]/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • possess in-depth knowledge of production techniques for cultivated agricultural plants in integrated and organic farming; • possess deep knowledge of modern processes in agronomy; • have skills in expert systems; • can recognise location and usage-specific features in the production of cultivated crops in ecological companies.		
Module content	• agrological and agricultural issues in organic farming • production, care, harvesting, storage, preliminary processing and marketing of crops in organic (ecological) soil; • integrated farming: principles, forms and methods • current developments in agronomy and modern methods for the cultivation of crops • precision farming: methods and application • expert systems and models for the control of production procedures in agronomy		
Form(s) of instruction	Lecture (67%), tutorials (33%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 40, tutorials: 20		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, research paper or seminar Mark: oral examination (50%), research paper or seminar (50%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	40		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/honermeier
Required literature: see Stud.IP and department website

[1] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 62 (AB/PP)	**Biometry and Design of Experiments**	**1st sem.**	**6 CP**
Module	Biometry and Design of Experiments		
Module code	MK 62		
Faculty/Chair/ Department	FB09/Biometry and Population Genetics/Institute for Agronomy and Plant Breeding 2		
Associated degree course(s)/Semester taken	Master of Agronomy [1)]/1st semester 70% of the module will be performed in collaboration with MK 01, after that it will be split into either testing or bioinformatics (30%).		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamentals of biostatistics		
Learning outcomes	The students • can apply quantitative methods in agronomy; • can perform the appropriate testing methods of agronomy; • can assess experimental data statistically; • can check hypotheses and ascertain them with closing statistics.		
Module content	• biometrical issues • methods of describing statistics • testing theory and testing statistics • variance and regression analysis • single and multi-factored investing methods • evaluation using software packages		
Form(s) of instruction	Lecture (50%), tutorials including practical computer work (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, tutorials: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: weekly assignments, written examination Mark: tutorials (30%), written examination (70%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	20, otherwise parallel courses (tutorials)		
Language of instruction	partly German (MK 62), only English (MK 01)		

Homepage: http://www.uni-giessen.de/biometrie
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 63 (PP)	**Biological and Chemical Plant Protection**	**1st sem.**	**6 CP**
Module	Biological and Chemical Plant Protection		
Module code	MK 63		
Faculty/Chair/ Department	FB09/Applied Entomology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	Master of Agronomy 1/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have an in-depth understanding of the theoretical and practical issues in plant protection; • can apply plant protection principles in the chemical industry, crop producers, plant protection agencies and other Education institutions.		
Module content	• methods of plant protection • mechanisms of plant protection products (fungicides, herbicides, insecticides, acaricides) • strategies of plant protection • biological plant protection (entomophagy) • genetic strategies in plant protection (RNAi) • fungi, viruses, nematodes and bacteria in plant protection		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	70 consisting of: lecture: 40, seminar: 30		
Ab Preparation/revision	80		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar presentation (mandatory), each part must be marked “sufficient” Mark: written examination (50%), seminar presentation (50%) Written or oral examination Written or oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 64 (AÖ)	**Agricultural and Food Policy in the EU**	**1st sem.**	**6 CP**
Module	Agricultural and Food Policy in the EU		
Module code	MK 64		
Faculty/Chair/ Department	FB09/Agricultural and Development Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agricultural Science and Business Management[1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • are able to analyse and evaluate the frameworks and use of instruments in EU agricultural policy with the aid of partial and full analytical models and valuation methods of applied welfare economics.		
Module content	• Theoretical and applied welfare economics • recent developments in applied welfare economics • analysis and evaluation of EU agricultural and food policy • evaluation of agricultural reforms • agricultural policy and the eastward extension of the European Union • agricultural policy and World Trade Organisation round-table • EU financial plan • agrimonetary system • the significance of other policy areas for the food sector • evaluation of projects, policies and changeable frameworks • benefit cost analysis for goods not evaluated in markets • measurement of preferences and measurement of the willingness to pay		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	90		
Aa Contact hours	60 consisting of: lecture:30, tutorials: 30		
Ab Preparation/revision	30		
B Autonomous work	60 (creating project work)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: project work including presentation (obligatory), written examinations during the semester or final examination Mark: average of all modular examinations during semester (100%) or final examination mark (100%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1283/apopr2.html
Required literature: see Stud.IP and department website

[1)] May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MK 65 (EÖ)	**International Food Policy**	**1st sem.**	**6 CP**
Module	International Food Policy		
Module code	MK 65		
Faculty/Chair/ Department	FB09/Agricultural and Development Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	Master of Agribusiness[1)]/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can explain the reasons for poverty, famine and arrested development; • can assess which strategies are best suited to help overcome those deficiencies and the parts industrial countries, developing countries and transforming countries can play.		
Module content	• the food problem: measurement, explanation and the need for action • basic structure and interdependence of national food policies • measurement and statement of protection • price-levels and effects of EU agricultural policy on price stability • food policy in industrial, developing- and transforming countries • selected international policies • integration, liberalisation, globalisation • quantitative models for effect analysis and the Food Evaluation policies (computer based) • approaches in development policy for overcoming famine and poverty arising from practical cooperation in developmental work.		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	90		
Aa Contact hours	60 consisting of: lecture:30, tutorial: 30		
Ab Preparation/revision	30		
B Autonomous work	60 (project work)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: project work including presentation (obligatory), test in the semester or final examination Mark: average of module examinations (100%) or final examination mark (100%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1283/apopr2.html

Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 01	**Biochemistry 2**	**2nd or 4th sem.**	**6 CP**
Module	Biochemistry 2		
Module code	09-MP 01		
Faculty/Chair/ Department	FB 09/Biochemistry of Human Nutrition/Institute for Nutritional Sciences		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Chemistry, Biochemistry, Biochemistry 1 (MKE01)		
Learning outcomes	The students • have in-depth knowledge of and skills in the application of nutritionally relevant molecular biological, spectrophotometry and chromatography methods, • have experience and skills in the use of protein-based biochemical and cell biological techniques, • have knowledge of the qualitative and quantitative significance of biochemical, cell biological, molecular biological and enzymology analysis processes.		
Module content	• primer design, PCR, cloning, restriction digest, ligation • heterologous over expression of eukaryotic genes, production of recombined proteins • protein purification using affinity chromatography, SDS gel analysis • enzyme kinetics (linear and non-linear regression) • inhibitor studies and their analysis, determination of inhibitor types • photometric determination of riboflavin status (EGRAC) and haemoglobin concentration • determination of total antioxidant capacity in biological materials • 2D electrophoresis • crystallisation of proteins • x-ray diffraction analysis		
Form(s) of instruction	Seminar (30%), tutorial (70%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses	130		
Aa Contact hours	60, consisting of: seminar: 20, tutorial: 40		
Ab Preparation/revision	70, consisting of: preparation: 30, revision: 40		
B Autonomous work in the module	20, work in small groups		
C Final module examination	30		
Form(s) of assessment and contribution to final mark Form of module component retake examination Form of module retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration	Summer semester, annually, block course		
Intake capacity	60		
Language	German and English, partially in separate groups (as agricultural biotechnology is offered simultaneously)		

Homepage: http://wi.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/becker

Required literature: see Stud.IP or homepage of institute

[1)] May also be selected by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 02	**Molecular Biology and Genetic Variation**	**3rd sem.**	**6 CP**
Module	Molecular Biology and Genetic Variation		
Faculty/Chair/Department	FB09/Nutritional Biochemistry/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Chemistry 1, Biochemistry 1, Special Biochemistry I (MK 01 EW)		
Learning outcomes	Students: • have in-depth knowledge of the biosynthesis of nucleotides and of DNA and RNA as bearers of hereditary factors; • understand the structure of DNA and RNA as well as the principles of DNA replication, mutation and repair, RNA synthesis and splicing processes; • can discuss the control of gene expression in prokaryotes and mechanisms of gene expression in eukaryotes; • have a deep knowledge of the most important methods of molecular biology; • have knowledge in the field of nutritionally relevant, genetically determined diseases and their treatment, as well as in the field of gene therapy.		
Module content	• structure and function of DNA and RNA • transcription and translation • controlling the gene expression in prokaryotes • gene expression in eukaryotes • genetically determined metabolic diseases • genetic disposition, gene therapy, microarrays • restriction endonuclease, ligation, cloning, PCR, quantitative PCR, transformation, heterologous expression • multiplex PCR, DNA fingerprint, microsatellites • (c) DNA banks, plasmids, cosmids, YACS, reporter genes		
Form(s) of instruction	Seminar (70%), tutorial (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture:40, tutorial: 20 hours		
Ab Preparation/revision	60; consisting of: preparation: 40, revision: 20		
B Autonomous work	30 (work in small groups)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (90 min.) Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbz/fbr09/institute/ernaehrungswissenschaft/ag/becker
Required literature: see Stud.IP and department website

1) May also be chosen by students from other degree courses as a specialisation module

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 03	**Specialised Human Nutrition II**	**2nd/4th sem.**	**6 CP**
Module	Specialised Human Nutrition II		
Module Code	MP 03		
Faculty/Chair/Department	FB09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Home Economics		
Learning outcomes	Students • can independently work on, present and discuss selected and contemporary topics on human nutrition with the help of academic literature; • are able to make critical and informed comments on issues relating to nutrition; • can evaluate nutritional studies in relation to their quality and validity.		
Module content	• selected topics concerning nutritional science • luxury food (coffee, tea, alcohol) • non-essential food constituents • undesirable food constituents • reactive oxygen compounds and endogenous antioxidant systems • regulation of ingestion • fat tissues hormones • smell and taste • dietary supplements • outsider diets		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar contributions (presentations, exercises, discussion) and written examinations Mark: seminar contributions (50%), written examination (50%) Seminar and written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 04	**Physiological Evaluation of Food**	**4th sem.**	**6 CP**
Module	Physiological Evaluation of Food		
Module code	MP 04		
Faculty/Chair/Department	FB09/Human Nutrition – Physiological Evaluation of Foods/Department of Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Nutrition and Metabolism (MKE 42)		
Learning outcomes	The students • can distinguish between normal food, functional food, dietary supplement and novel food; • are able to evaluate prevention measures through "old" and "new" food critically based on nutritional reactions in the human organism; • can independently prepare a selected topic, compile a paper and present the topic.		
Module content	• definition and distinction of food and other nutrient sources, bioavailability of food constituents • proof of efficacy (biomarkers etc.) • potential of (functional) food for influencing nutrition-related diseases (e.g. adiposity, metabolic syndrome, atherosclerosis, osteoporosis and others) • disease prevention in different population groups and life stages		
Form(s) of instruction	Lecture with discussion (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	90 consisting of: preparation: 30, revision: 30		
B Autonomous work	30: work in small groups		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar work and written examination Mark: seminar work (25%) and written examination (75%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/kunz

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 05	**Food Technology**	**4th sem.**	**6 CP**
Module	Food Technology		
Module code	MP 05		
Faculty/Chair/Department	FB09/Food Technology/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can classify technological procedures for processing and handling plant-based food with particular consideration of bakery technology.		
Module content	• presentation of unit operations (heating, vaporising, freezing, spray drying, agglomerating, pasteurising, sterilising, preserving, blanching) of plant-based food • raw material and commodity economics of flours and groats from breadstuffs • milling technology • technological principles of bread making • pastry products, tarts and pasta		
Form(s) of instruction	Lecture (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/food/
Required literature: see Stud.IP and department website

MP 06	**Clinical Nutrition**	**3rd sem.**	**6 CP**
Module	Clinical Nutrition		
Module code	MP 06		
Faculty/Chair/Department	FB09/ International Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Pathophysiology and Nutritional Medicine (MKE 37)		
Learning outcomes	The students • can take nutritional anamnesis of disease, recognise symptoms and evaluate further reports; • know the principles of treating diseases related to nutrition; • can prepare nutritional treatment; • know the practice of artificial nutrition (enteral, parenteral).		
Module content	Nutritional care for patients with: • endocrine disorders • haematological disorders • eating disorders (adiposity, anorexia, bulimia) • metabolic disorders • osteological diseases • kidney diseases • cardiovascular diseases • adiposity and metabolic disease • chronic inflammatory bowel diseases • liver and biliary tract diseases • artificial nutrition (enteral, parenteral)		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written or oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	24		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/int-nutr/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 07	**International Food Security II**	**2nd sem.**	**6 CP**
Module	International Food Security II		
Module code	MP 07		
Faculty/Chair/Department	FB09/International Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	all MSc core modules, BP 08 recommended		
Learning outcomes	The students • have in-depth knowledge about protein energy malnutrition and micronutrient deficiency states and managing them; • know anthropometric methods of diagnosing malnutrition; • can analyse the requirements for food security for countries and regions and give recommendations; • know the problems of the "double burden" of malnutrition; • can set the indication for food assistance and know how to implement it.		
Module content	• pathogenesis, clinic, diagnostics and management of protein energy malnutrition • micronutrient deficiency states • interaction disease/nutritional disorder • basic conditions for food security • analyses, guidelines and problems of food assistance • anthropometric measurement methods with exercises • methods of nutritional surveying in countries with low income • institutions for development cooperation including institution visits • food in tropical countries • epidemiology of nutritional disorders • gender aspects of food security		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination and oral presentation Mark: written report (50%), oral presentation (50%) Seminar and written examination - Written or oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German (50%)/English (50%)		

Homepage: http://www.uni-giessen.de/fbr09/int-nutr/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 08	**Project and Programme Management**	**4th sem.**	**6 CP**
Module	Project and Programme Management		
Module code	MP 08		
Faculty/Chair/Department	FB09/Nutrition Education and Consumer Behaviour/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	3rd/4th sem./ final study period		
Learning outcomes	The students • have the ability to plan, design and implement projects; • have information and material about marketing strategies (situation and market analysis, aims and target groups, developing and organising project offerings and activities), sponsoring and fundraising, implementation strategies on the level of decision-making; • can use media in a target-group-specific, effective way; • know evaluation principles and can apply selected survey methods; • can collect data and interpret it according to criteria of effectiveness and efficiency.		
Module content	• written report on a project (setting approach) for a target group (job/business, society/family, school/kindergarten and other institutions) • implementation of the project with the target group • analysis and evaluation within the seminar group, externally with target group representatives		
Form(s) of instruction	Project seminar (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60: seminar		
Ab Preparation/revision	60		
B Autonomous work	30: work in small groups		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written report on project planning, oral presentation Mark: written report (50%), oral presentation (50%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/ebvv/
Required literature: see Stud.IP and information during instruction

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 10	**Quality Management for Personal Service Institutions**	**3rd sem.**	**6 CP**
Module	Quality Management for Personal Service Institutions		
Module code	MP 10		
Faculty/Chair/Department	Faculty 09 / Management of Services for Persons / Institute for Household Economy and Consumer Research		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the essential current forms, orientation and concepts of social care, • have a broad overview of different methods of demand analysis and planning, • are familiar with requirements and problems concerning production and management of multidimensional criteria and target systems, • can deal with different quality definitions, • know the systems and methods of quality management, • can evaluate and optimise economic decisions of personal service institutions with regard to the quality of personal care.		
Module content	• analytic and planning-related milieu concepts • forms of care, how they developed and changed • dimensions of programmes in milieu therapy and milieu planning • term and meaning of quality management • concepts of quality management (including HACCP, quality management systems, total quality management) • quality control and quality reporting		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment and presentation, written examination Mark: written assignment and presentation (50%), written examination (50%) - Written examination		
Frequency, duration in semesters	Winter semester, annually, 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/schneider

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 11	**Socioeconomic Counselling**	**3rd sem.**	**6 CP**
Module	Socioeconomic Counselling		
Module code	MP 11		
Faculty/Chair/Department	FB09/Nutrition Education and Consumer Behaviour/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • get to know the socioeconomic behavioural approach; • learn to recognise and interpret the debt and insolvency of private households and families in Germany as well as in comparison to the socioeconomic situation in other countries, reflecting international standards in their causal relationships; • get to know models of credit consulting (including settlement of debts and debt relief) and prevention on a local and national level and learn to teach conversation techniques.		
Module content	• theories and models of socioeconomic behavioural research • empirical studies and explanation concepts of insolvency and poverty • federal Government reports (poverty and wealth report, family reports, bills of health) and official statistics • household analysis and family-oriented counselling approach • consumer insolvency proceedings • methods of non-directive/directive conversation techniques with clients, debt counselling, and financial/credit institutions; media and work material for credit counselling, poverty and debt prevention		
Form(s) of instruction	Lecture (20%), seminar (30%), case study (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation of realized case studies and report concepts Mark: presentation of realized case studies and report concepts (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	15		

Homepage: http://www.uni-giessen.de/fbr09/ebvv/

Required literature: see Stud.IP and information given during instruction

09-MP 12	**Process Engineering Laboratory**	**3rd/4th sem.**	**6 CP**
Module	Process Engineering Laboratory		
Module code	MP 12		
Faculty/Chair/Department	FB09/Process Technology in Food and Service Companies/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Officially none; the contents from BP 27 and MKEÖ/MKH 53 are required for basic knowledge		
Learning outcomes	The students • know the scientific approach to laboratory experiments for process technology in food and service companies; • can apply their enhanced knowledge to experiments in thermodynamics; • are able to conceive test set-ups for technical product and process testing; • have exemplary knowledge of pertinent standards in the field of technical product testing; • know basic measurement principles for physical values (pressure, temperature, trajectory, time, energy, work, power), the setup and calibration of a measuring chain including analogue and digital measurement data acquisition; • understand the application of statistical design and interpretation of experiments and error analysis; • have learned to implement and apply methodical and experimental knowledge of food sensory science.		
Module content	• cooking processes • cleaning technology • drying technology • refrigeration technology, cycle processes • food sensory science – methods and experimental application		
Form(s) of instruction	Laboratory exercises in small groups (50%), food sensor technology block seminars (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: laboratory exercises in small groups: 20, block seminars: 40		
Ab Preparation/revision	60 consisting of: laboratory exercises in small groups: 30, block seminars: 30		
B Autonomous work	30: written assignment with presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment with presentation; written or oral examination Mark: written assignment with presentation (50%), written or oral examination (according to intake) (50%) Written or oral examination Written or oral examination		
Frequency, duration in semesters	Winter and summer semester, annually 1 semester		
Intake capacity	20		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 13	**Economic Development and World Agricultural Markets**	**2nd sem.**	**6 CP**
Module	Economic Development and World Agricultural Markets		
Module code	MP 13		
Faculty/Chair/Department	FB09/Agricultural and Development Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students: • are able to analyse and systematise the problem of development in its various dimensions and to establish connections to poverty, hunger and malnutrition; • are able to provide explanatory approaches to the existence of underdevelopment, poverty and food insecurity; • are able to assess agricultural and developmental policy measures and problem-solving strategies; • are able to understand the characteristics of world agricultural markets as well as price formation on and interdependencies between such markets; • are able to explain the influence of national and international agricultural market policy on world agricultural trade; • understand the relationship between agricultural trade and economic development.		
Module content	• underdevelopment, poverty and hunger: a survey • causes of underdevelopment, poverty and hunger • micro and macroeconomic development strategies • role of the agricultural sector and agricultural policy in the developing world • agricultural policies of industrialised countries and development • sustainable development • growth, transformation and development • globalisation from the perspective of the developing world • features of world agricultural markets (price instability, terms of trade)		
Form(s) of instruction	Lecture (80%), exercises (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 48, exercises: 12		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended standing	2nd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/~gh1283/apopr2.html
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 14	**Production and Quality Management**	**4th sem.**	**6 CP**
Module	Production and Quality Management		
Module code	MP 14		
Faculty/Chair/Department	FB09/Process Technology in Food and Service Companies/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Officially none; the contents from MKEÖ/MKH 53 are required for basic knowledge		
Learning outcomes	The students • have in-depth knowledge about the essential elements of quality management according to ISO 9000 ff., of hygiene management according to HACCP, and of environmental management according to ISI 14000 ff. in their application to process chains for food; • know the technical and legal requirements for food packaging according to the German LFGB (food and fodder law) including related regulations; • are familiar with systems of interface management (e.g. BRC, EUREPGAP, IFS, QS, etc.), can evaluate them scientifically, introduce them to operational practice and advance existing operational systems; • know technical principles and the legal basis for disposal in food and service companies and in private households; • can deal with situations concerning certification, auditing, supplier evaluation and planning of interface specification.		
Module content	• food packaging made of glass, paper, composite board, plastics (PE, PP, PS, PET), metal (steel, aluminium) and other materials • requirements for food packaging from the point of view of packaging manufacturers, food bottlers, wholesale and retail, end-consumers and disposers • quality management systems of exemplary process chains (e.g. beverages) from primary production from usage through to disposal • technical requirements for raw and auxiliary materials including food packaging from a legal point of view • disposal systems		
Form(s) of instruction	Main seminar including subject excursion with a set number of students (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 40, tutorials: 20		
Ab Preparation/revision	60 consisting of: lecture: 30, tutorials: 30		
B Autonomous work	30: written assignment with presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment and presentation, written or oral examination (depending on cohort size) Mark: written assignment and presentation (50%), written or oral examination (depending on cohort size) (50%) Written or oral examination Written or oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 15	**Internship in Food and Service Enterprises**	**1st to 4th sem.**	**6 CP**
Module	Internship in Food and Service Enterprises		
Module code	MP 15		
Faculty/Chair/Department	FB09/Process Technology in Food and Service Companies/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/1st – 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None; participation in MKEÖ/MKH 53, MP 12 and MP 14 is recommended		
Learning outcomes	The students • gain practical experience in food and service companies about operations and forms of organisation in an enterprise, especially in the areas of research and development, application technology, purchase, production, distribution, supply, disposal as well as quality management including laboratory; • have deep knowledge about product development and application-specific food inspection and consumer goods (food chemistry, sensor technology); • know systems for internal and external interface management, can introduce these to a company and/or advance existing operational systems; • gain an insight into certification, auditing and supplier evaluation in food and service companies.		
Module content	• students work in a pre-approved company for at least 9 weeks • operations and forms of organisation in an enterprise, especially in the areas of research and development, application technology, purchase, production, distribution, supply, disposal as well as quality management including laboratory • internal and external quality management systems in food and service companies • technical and legal requirements for food and fodder, consumer goods as well as raw and auxiliary materials including packaging • interface management including supplier evaluation, certification and auditing		
Form(s) of instruction	Internship in a company agreed in advance (9 weeks) (60%), final main seminar with examination candidates (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60, main seminar		
Ab Preparation/revision	90 consisting of 9 weeks internship (90)		
B Autonomous work	20: written assignment with presentation		
C Final module examination	10		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written assignment with presentation Mark: written assignment with presentation (100%) - Oral examination		
Frequency, duration in semesters	Winter and summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 16	**Quality Aspects and Quality Analysis of unprocessed Plant-based Foodstuffs**	**1st sem.**	**6 CP**
Module	Quality Aspects and Quality Analysis of unprocessed Plant-based Foodstuffs		
Faculty/Chair/Department	FB09/Agronomy/Institute for Crop Farming and Cultivation 1		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Knowledge about crop production and plant-derived food		
Learning outcomes	The students • have differentiated knowledge about ingredients and quality requirements for unprocessed plant-derived foodstuffs; • can conduct practical laboratory analyses of unprocessed plant derived foodstuffs; • have in-depth knowledge of the measures and factors influencing quality in the production and first processing of raw plant-derived material; • gain an insight into different companies which process raw plant-derived material and understand their methods of processing.		
Module content	• regulations, equipment and ISO standards for sampling and sub-sampling • sensory evaluation of analysed goods • indirect and direct methods for analysing product quality • quality requirements and measures of quality assurance in raw plant-derived material: cereals, oilseeds, legumes, table potatoes, starch potatoes and industrial potatoes, sugar plants, specialised crops, brewer's and ethanol grain • technological procedures for producing beet sugar, malt and products from hulling and flour milling		
Form(s) of instruction	Lecture (50%), tutorials (40%), excursion (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, tutorial: 24, excursion: 6		
Ab Preparation/revision	90 consisting of: preparation and revision: 90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, protocol, assignment or seminar Mark: written examination (67%), protocol, assignment or seminar (33%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	40		
Language of instruction	German		

Homepage: http://wi-uni-giessen.de/wps/fb09/home/honermeier
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 17	**Medicinal, Spice and Dye Spice Plants**	**1st sem.**	**6 CP**
Module	Medicinal, Spice and Dye Plants		
Faculty/Chair/Department	FB09/Agronomy/Institute for Agronomy and Plant Breeding I		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamental knowledge in biology, crop production and plant foodstuffs		
Learning outcomes	The students • have deep knowledge of genus, drug quality and the cultivation of the most important native medicinal, spice and dye plants; • can characterise and categorise the most important classes and types of medicinal, spice and dye plants; • know the most important methods of assessing the quality of medicinal and spice plants (microscopy, distillation, GC, DC, HPLC) and can apply them.		
Module content	• introduction, relevance, classification, legal regulations as well as requirements for drug quality and production • Identification and pharmacological importance of relevant active substances and ingredients (essential oils, bitters, flavonoids, alkaloids, cardiac glycosides, mucilages, harmful substances, coumarins, saponins) • analytics of selected active substances (distillation, GC, DC, HPLC) • medicinal plants (leaf drugs, seed drugs, root drugs, blossom drugs) • biological basics (taxonomy, morphology, phenology) of medicinal plants • cultivation and methods of cultivating medicinal plants • biology, drug identification, active substances, application and cultivation of aromatic and dye plants		
Form(s) of instruction	Lecture (50%), tutorial (40%), excursion (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, tutorial: 25, excursion: 5		
Ab Preparation/revision	90 consisting of: preparation and revision: 90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, protocol, assignment or seminar Mark: written examination (67%), protocol, assignment or seminar (33%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	50		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/honermeier
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 19	**Cropping Systems and Crops in the Tropics and Subtropics**	**2nd sem.**	**6 CP**
Module	Cropping Systems and Crops in the Tropics and Subtropics		
Module code	MP 19		
Faculty/Chair/Department	FB09/Agronomy/Institute for Crop Farming and Cultivation 1		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Previous knowledge of botany, plant genetics and agronomy		
Learning outcomes	The students • have specialised knowledge about production systems for farmland and grassland crops as well as tropical and subtropical fruits and vegetables; • can recognise production problems in the tropics and subtropics regarding location and cultivation factors.		
Module content	• specific problems of breeding and propagation of crops in the tropics and subtropics • specific problems of plant protection in the tropics and subtropics • urban and peri-urban plant production • irrigation farming • soil salination (occurrence and spreading, impact on the plant, countermeasures) • plant production in wind erosion systems • specific problems of grassland utilisation • breeding, quality, cultivation methods and warehousing for selected types of cultivated plants (crops and pseudocereals, oleiferous and fibre plants, sugar plants, fruit and vegetable plants, legumes)		
Form(s) of instruction	Lecture (50%), seminar (33%), excursion (17%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	160		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 20, excursion: 10		
Ab Preparation/revision	100		
B Autonomous work	-		
C Final module examination	20		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar Mark: written examination (67%), seminar (33%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	50		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/honermeier
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 20	**Plant Breeding: Special Topics of Resistance and Quality**	**2nd sem.**	**6 CP**
Module	Plant Breeding: Special Topics of Resistance and Quality		
Module code	MP 20		
Faculty/Chair/Department	FB09/Crop Farming/Institute for Crop Farming and Breeding I		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • will gain in-depth knowledge about the breeding goals regarding disease resistances and quality aspects of important crops; • will gain in-depth knowledge about the essential methods to record the respective resistance and quality attributes; • will gain knowledge on how to realise the respective breeding goals in the breeding process depending on the genetics (heritability) and ways of fertilisation and reproduction; • will gain the required knowledge about the application of biotechnological, gene technological and molecular-biological tools with respect to optimising resistance and quality parameters of important agricultural crops.		
Module content	• natural diversity and genetics of resistance against the most important pests of the major crops • detection methods resistance reaction according to pathogens • detection methods of important quality parameters of the major crops • natural diversity and genetics of quality parameters (cereals, oil and protein plants) • methods to increase the genetic variation (e.g. mutagenesis) • methods of cell and tissue culture and their use in breeding for resistance and quality		
Form(s) of instruction	Lecture (50%), excursion (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60, lectures: 30, excursions: 30		
Ab Preparation/revision	60, lectures: 30, excursions: 30		
B Autonomous work	30, lectures: 15, excursions: 15		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: 1 oral examination Mark: examination (50%), seminar (30%), protocol (20%) Respective part of the examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended standing	2nd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.plant-breeding-giessen.de/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 21	**Biotechnology and Genomics**	**2nd sem.**	**6 CP**
Module	Biotechnology and Genomics		
Module code	MP 21		
Faculty/Chair/Department	FB09/Crop Farming/Institute for Crop Farming and Breeding I		
Associated degree course(s)/Semester taken	Master of Science Agrobiotechnology/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Knowledge of molecular genetics		
Learning outcomes	The students • shall deepen their theoretical knowledge about genome analysis methods, with an emphasis on plant genome mapping and gene expression techniques; • will gain insight into the practical applications of biotechnological and molecular genetic methods in plant breeding; • will obtain the necessary theoretical background to apply experimental molecular genetics, biotechnological and gene technological methods in plant breeding.		
Module content	• molecular and cellular plant genetics • methods and techniques of experimental biotechnology and genome analysis • molecular plant breeding: structure and function of plant genomes, molecular markers, genome mapping, QTL analysis, gene cloning techniques, gene expression methodology • methods of gene technology in plant breeding: gene isolation, gene transfer (transformation techniques), detection methods		
Form(s) of instruction	Lecture (80%), excursion (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	70 (lectures: 50, excursions: 20)		
Ab Preparation/revision	60 (lectures: 40, excursions: 20)		
B Autonomous work	50 (lectures: 30, excursions: 20)		
C Final module examination	Written examination (2 hours)		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: examination and homework Mark: examination (80%), homework (20%) Written examination (2 hours)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	English		

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 22	**Production Processes in Organic Farming**	**2nd sem.**	**6 CP**
Module	Production Processes in Organic Farming		
Faculty/Chair/Department	FB 09/Institute of Agronomy and Plant Breeding II / Professorship of Organic Farming		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • gain a deep insight into the nature of ecological agricultural production; • are able to critically assess opportunities and limits of organic crop procuction with regard to aspects of ecological and agronomical sustainability (ecosystem services and disservices, soil organic matter, carbon sequestration, nutrient supply and nutrient dynamics, environmental impacts) • know about state and implications of specialization and intensivation processes in organic farming • have an overview on actual research topics, research institutions and research initiatives in organic arable farming		
Module content	• • basics of organic crop production (focus: ecosystem services and disservices to organic crop production) • sustainability of organic farms and farming systems • state and implications of intensivation and specialization processes • environmental impacts of organic farming systems (carbon sequestration, GHG emissions, groundwater, biodiversity) • interrelation between soil organic matter and crop production • plant nutrition in organic farming (N, S, P, micronutrients) • Opportunities and limitations of reduced tillage in organic farming • Organic plant breeding and seed production • Critical assessment of EU organic farming regulations		
Form(s) of instruction	Lecture (70%), tutorials (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of lecture: 40, tutorial: 20		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written article, presentation and discussion Mark: written article (75%); presentation and discussion (25%) Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	40		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/orglandbau
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 23	**Ecophysiology and Yield Physiology of Plant Nutrition**	**2nd sem.**	**6 CP**
Module	Eco and Yield Physiology of Plant Nutrition		
Module code	MP 23		
Faculty/Chair/Department	FB09/Plant Nutrition/Institute for Plant Nutrition		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BK 24 A Plant Nutrition or MK 58 PP Nutrition Physiology of Agricultural Crops		
Learning outcomes	The students • have deep theoretical knowledge of ecological and yield aspects of plant nutrition; • can understand problems of plant nutrition in a larger context; • understand methods of ecological and yield research.		
Module content	• source sink relations • drought stress • soil salinity • soil acidity • problems relating to heavy metals		
Form(s) of instruction	Lecture (50%), seminar (25%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	140		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 15, tutorial: 15		
Ab Preparation/revision	80		
B Autonomous work	20 (exercises, presentation)		
C Final module examination	20		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (30 min.), group work and presentation Mark: oral examination (50%), group work (25%) and presentation (25%) Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	35		
Language of instruction	German or English upon agreement		

Homepage: http://www.uni-giessen.de/plant-nutrition/

Required literature: Schubert, S.: *Pflanzenernährung, Grundwisen Bachelor, Verlag Eugen Ulmer, Stuttgart 2006*

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 24	**Molecular Biology of Plant Nutrition**	**4th sem.**	**6 CP**
Module	Molecular Biology of Plant Nutrition		
Module code	MP 24		
Faculty/Chair/Department	FB09/Biochemistry of Plant Nutrition/ Institute for Plant Nutrition		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Nutrition Physiology of Agricultural Crops (MK 58)		
Learning outcomes	The students • have theoretical knowledge of the molecular biological aspects of plant nutrition; • know methods of molecular biological research.		
Module content	• gene regulation • gene cloning and sequencing • molecular biological methods (blotting techniques, reverse transcription, gel electrophoresis, restriction analyses, PCR dyeing techniques)		
Form(s) of instruction	Laboratory (33%), lecture (33%), tutorials (33%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 20, laboratory: 20, guided tutorials: 20		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German/English		

Homepage: http://www.uni-giessen.de/plant-nutrition/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 25	**Biological Pest Control**	**2nd sem.**	**6 CP**
Module	Biological Pest Control		
Module code	MP 25		
Faculty/Chair/Department	FB09/Applied Entomology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have important knowledge of the various methods of biological pest control (including classical biological control, inundative release etc.); • have competencies in biology and ecology as well as the possible applications of entomopathogenic organisms (fungi, viruses, bacteria, protozoa) in modern procedures of microbiological plant protection; • know the basic principles for important procedures in biotechnological plant protection strategies; • can estimate how and to what extent these individual methods can be used in the context of integrated control concepts.		
Module content	• case studies on classical biological pest control procedures, inundative release of antagonists (in the field and in the greenhouse), and strategies for the preservation of natural enemies in agricultural ecosystems • possible applications for pheromones (monitoring, mass trapping, mating disruption, "lure and kill") and other biotechnological plant protection methods in agriculture and in stored product protection • classification, biology and ecology of entomopathogens and their possible applications in plant protection (production and application techniques) • compatibility and possibilities for the integration of different biological, microbiological and biotechnological plant protection methods in the overall context of integrated control procedures		
Form(s) of instruction	Lecture (57%), seminar (11%), tutorials (11%), excursion (21%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	140 consisting of: lecture: 80, seminar: 15, tutorial: 15, excursion: 30		
Ab Preparation/revision	10		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar presentation Mark: written examination (50%), seminar presentation (50%) Written or oral examination Written or oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: see Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 27	**Pest and Diseases of Tropical Crops**	**3rd sem.**	**6 CP**
Module	Pest and Diseases of Tropical Crops		
Module code	MP 27		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know important diseases and pests of tropical agricultural plants (medical plants e.g., coffee and tea, oil plants, cereals, vegetables, fruit, fibre plants); • are familiar with the significance of animal vectors in major tropical plant diseases; • know appropriate control strategies, with an emphasis on integrated processes.		
Module content	• systematics, biology, ecology and epidemiology of important tropical crop pests and pathogens • options for combating diseases and pests of tropical crops, with an emphasis on biological and integrated processes • problems of resistance to pathogens and pests		
Form(s) of instruction	Lecture (25%), seminar (50%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	160		
Aa Contact hours	60 consisting of: lecture: 15, seminar: 30, tutorials: 15		
Ab Preparation/revision	100		
B Autonomous work	-		
C Final module examination	20		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Recommended standing	3rd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Required literature: see Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 28	**Modelling and Simulation of Biological Processes**	**2nd sem.**	**6 CP**
Module	Modelling and Simulation of Biological Processes		
Module code	MP 28		
Faculty/Chair/Department	FB09/Biometry and Population Genetics/Institute for Crop Farming and Cultivation 2		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Principles of Statistics and Mathematics		
Learning outcomes	Students have knowledge and skills in: • modelling and simulating biological processes; • system analysis; • applying the respective software.		
Module content	• introduction to modelling • modelling and simulation in the context of biological problems • experimental and theoretical system analysis • methods for calibration (parametric rating) and for verification • validation of models • working with software packages		
Form(s) of instruction	Lecture (50%), tutorials with practical PC work (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, project work: 30		
Ab Preparation/revision	60		
B Autonomous work	30: PC work		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: exercise/written assignment Mark: exercises/written assignment (100%) Written assignment Written assignment		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	20 or tutorials in parallel courses		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/biometrie
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 29	**Plant-Microbe Interactions**	**2nd/4th sem.**	**6 CP**
Module	Plant-Microbe Interactions		
Module code	MP 29		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basics in microbiology and phytopathology		
Learning outcomes	The students • recognise the connections among interactions of parasitic and symbiotic biocenoses; • can discuss the application of alternative measures for pesticide reduction; • can describe the biochemical and molecular-biological mechanisms of incompatibility and compatibility; • know the main significance of the root as a highly endangered phytomedical organ; • are familiar with concepts of modern interdisciplinary approaches to research in resistance and the use of microorganisms in pest control; • can understand review articles from relevant international journals on phytopathological and microbiological soil research.		
Module content	• morphology and biochemistry of roots • physical and chemical conditions in the rhizosphere (pH, O2, exudate gradients) • transport processes in plants • root pathogens (protozoa, chromista, fungi) • morphology and biochemistry of parasitic seed plants • pest control strategies for roots • growth promotion through rhizospheric microorganisms (N2 fixation, regulation of the nif gene, plant-promoting factors, mycorrhiza) • resistance mechanisms • pest control through microorganisms (bacterial toxins as insecticides) • possibilities and limitations of inoculation with VAM or N2-fixing bacteria • cultivation approaches • quantitative resistances • biomathematics		
Form(s) of instruction	Lecture (75%), seminar (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, seminar 30		
Ab Preparation/revision	70 consisting of lecture: 40, seminar: 30		
B Autonomous work	20: lecture		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar: each part must be sufficient Mark: written examination (70%), seminar (30%) Respective part of examination oral or written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended standing	2nd or 4th semester		
Intake capacity	60		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: see Stud.IP a

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 30	**Special Breeding and Husbandry of Small Animals (Farm Animals and Pets)**	**2nd sem.**	**6 CP**
Module	Special Breeding and Husbandry of Small Animals (Farm Animals and Pets)		
Module code	MP 30		
Faculty/Chair/Department	FB09/Small Animal Breeding/ Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Bachelor in Agricultural Sciences		
Learning outcomes	The students • can recognise biological and physiological constitutive features; • can assess selective features that are genetically relevant for breeding; • have an understanding, knowledge, and skills in the application of breeding goals, efficiency tests, breeding and keeping methods; • are capable of evaluating animal welfare and ecological tolerance in small animal keeping and breeding.		
Module content	• biological, physiological and genetic principles of reproduction and adaptability • criteria and methods for determining selection procedures • theory and application of heterosis • resistance breeding • breeding goals, efficiency tests, and selection procedures • environmental standards and keeping methods		
Form(s) of instruction	Lecture (80%), tutorials (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 48, tutorial: 12		
Ab Preparation/revision	60		
B Autonomous work	30: tutorial presentation, independent work		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 31	**Cell Biology and Cell Physiology of Domestic Animal Constitution**	**1st sem.**	**6 CP**
Module	Cell Biology and Cell Physiology of Domestic Animal Constitution		
Module code	MP 31		
Faculty/Chair/Department	FB09/Small Animal Breeding/ Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	B.Sc. Agr., B.Sc. Nutritional Sciences		
Learning outcomes	The students • have in-depth knowledge of the theory of constitution; • have a comprehensive understanding and skills in the application of cell biological and physiologic al methods for analysing and characterising the constitution on different levels of observation; • can independently evaluate mid and long-term breeding and genetic measures for the constitution.		
Module content	• Conceptual determination and theoretical basics of the constitution • cell structural and functional determinants of the reproductive, adaptive, productive, somatic and mental constitution • important scientific issues concerning the exploration of the cause of labile constitution • anatomic-histological, cell physiological and molecular biological methods for analysing and characterising the constitution • review and application of cell biological and physiological methods in practical selection		
Form(s) of instruction	Lecture (50%), project work and seminar (25%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, tutorial: 15, seminar: 15		
Ab Preparation/revision	60: preparation and revision of lecture and seminar		
B Autonomous work	30: preparing the project		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar and project work, oral examination Mark: seminar and project work (50%), oral examination (50%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 32	**Methods of Experimental Genetics**	**2nd sem.**	**6 CP**
Module	Methods of Experimental Genetics		
Module code	MP 32		
Faculty/Chair/Department	FB09/Animal Breeding and Genetics/ Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	B.Sc. agr., B.Sc. Nutritional Sciences, BP 46 (recommended)		
Learning outcomes	The students • can classify methods and procedures of genetics; • can conduct the methods independently and give a valuation of their implementation and use in animal breeding and genetics.		
Module content	• Security measures and regulations in the laboratory • biochemical genetics: illustration of protein polymorphisms using different electrophoretic methods • cytogenetics: illustration of chromosomes and karyograms • molecular genetics: DNA isolation, cloning, compiling gene libraries, hybridisation, sequencing and PCR, illustration of DNA polymorphisms (PCR, RFLP, SSCP, sequencing) • use of methods for problems concerning animal breeding		
Form(s) of instruction	Lecture (25%), guided tutorials (75%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 15, tutorials: 45		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	12		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 33	**Immune Biology, Hygiene and Infectious Diseases in Farm Animals**	**4th sem.**	**6 CP**
Module	Immune Biology, Hygiene and Infectious Diseases in Farm Animals		
Module code	MP 33		
Faculty/Chair/Department	FB 09/Animal Husbandry and Biology of Husbandry/Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Core module MSc Livestock Sciences		
Learning outcomes	The students • have skills in the areas of animal hygiene, including poultry hygiene, and can classify infectious diseases (Epizootic diseases, infectious multifactorial diseases) in farm animals; • can assess the implementation of measures for animal hygiene and environmental health in agricultural enterprises; • are familiar with the essential points of immunobiology.		
Module content	• common causes of diseases • general and specific epidemic prophylaxis (including disinfection, sterilisation, disinfestation, carcass disposal) • characterisation of pathogens (bacteria, viruses, fungi) • pathogen host interactions, aetiopathogenesis of infectious diseases in livestock • vaccination • poultry hygiene • spread of livestock diseases • immunobiology		
Form(s) of instruction	Lecture (75%), seminar (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 45, seminar: 15		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 34	**Laboratory Course in Feed Analysis**	**2nd sem.**	**6 CP**
Module	Laboratory Course in Feed Analysis		
Module code	MP 34		
Faculty/Chair/Department	FB09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • are capable of understanding and implementing analysis regulations; • can analyse fodder contents, additives and unwanted substances and evaluate the results; • gain in-depth understanding of the application of estimation techniques; • learn to evaluate the quality of fodder using quick tests and organoleptic tests.		
Module content	• analysis of fodder contents, additives, unwanted substances and hygienic status using chemical, physical and biological methods • application of official estimation techniques for an energy value analysis of fodder • quick tests and organoleptic tests of stalk fodder, cereals and commercial fodder		
Form(s) of instruction	Laboratory in small groups (90%) with introductory seminar (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: introductory seminar: 6, laboratory: 54		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually Block seminar		
Intake capacity	24		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 35	**Comparative Digestive and Metabolic Physiology**	**2nd sem.**	**6 CP**
Module	Comparative Digestive and Metabolic Physiology		
Module code	MP 35		
Faculty/Chair/Department	FB09/Animal Nutrition/ Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	• knowledge about anatomy and physiology of the digestive tract in omnivorous, herbivorous and carnivorous species • knowledge about digestion and absorption of nutrients in monogastrics and ruminants • knowledge about microbial digestion in ruminants and monogastrics • knowledge about energy metabolism • knowledge about intermediary metabolism of macronutrients • knowledge about organ-specific intermediary metabolism and endocrine regulation of metabolism		
Module content	• comparative anatomy and physiology of the digestive tract in omnivorous, herbivorous and carnivorous species • digestion and absorption of nutrients in monogastrics and ruminants • microbial digestion in ruminants and monogastrics • energy metabolism • intermediary metabolism of macronutrients • organ-specific intermediary metabolism and endocrine regulation of metabolism		
Form(s) of instruction	Lecture (50%), project seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (50%), project seminar (50%) Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 36	**Nutrition of Domestic and Laboratory Animals**	**3rd sem.**	**6 CP**
Module	Nutrition of Domestic and Laboratory Animals		
Module code	MP 36		
Faculty/Chair/Department	FB09/Animal Nutrition/Institute for Animal Nutrition and Nutrition Physiology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have specialised knowledge of nutritional particularities for dogs, cats, laboratory rodents, small herbivores, pet birds and other pets; • know the link between nutrition and health as well as dietetic measures; • have knowledge of the central aspects of special fodder technology and the production of suitable complementary and complete foodstuffs.		
Module content	• nutritional particularities of pets and laboratory animals • nutritional concepts in practice and research • diseases related to nutrition and dietetic measures • recipes and technology for special fodder as well as for complementary, complete and diet foodstuffs		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, tutorials: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/animal-nutrition
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 40	**Physiology an Pathology of Reproduction of Farm Animals**	**1st sem.**	**6 CP**
Module	Physiology an Pathology of Reproduction of Farm Animals		
Module code	MP 40		
Faculty/Chair/Department	Faculty 10 Veterinary Medicine/Clinic for Obstetrics, Gynaecology and Andrology of Large and Small Animals		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have in-depth knowledge of the core molecular biological and neuroendocrine issues in reproductive biological processes; • can evaluate reproductive processes and implement them with female and male livestock.		
Module content	• neuroendocrine and molecular biological regulation of female and male propagation • biotechnological control and manipulation of reproduction • practical exercises in andrology, gynaecological demonstrations • additionally and upon consultation: seminar and practical exercises for gaining validation as an own-stock inseminator (16 hours)		
Form(s) of instruction	Seminar (80%), tutorials (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: seminar: 48, tutorials: 12		
Ab Preparation/revision	60 consisting of: seminar: 50, tutorials: 10		
B Autonomous work	30: seminar		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar presentation, oral examination Mark: seminar presentation (50%), oral examination (50%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	12		
Language of instruction	German		

Homepage: http://www.vetmed.uni-giessen.de/geburtshilfe/vetmed.htm
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 42	**Locational Economy and Locational Planning**	**2nd sem.**	**6 CP**
Module	Locational Economy and Locational Planning		
Module code	MP 42		
Faculty/Chair/Department	FB09/Project and Regional Planning / Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the economic theories and the quantitative methods for determining the production range, the production variety and the production intensity of companies in agrarian and food industry according to the current natural and economic conditions of location; • know the theories and methods for determining ideal locations for companies which distribute and process agricultural products; • can assess the advantages of regional division of labour and regional supply chains.		
Module content	• location effect theory • natural and economic locational conditions which have integrating and differentiating effects • integrating i.e. diversifying forces: work balance, capacity utilisation, crop rotation, feed balance and balancing of risks • differentiating forces i.e. influencing the specialisation of companies: natural conditions for production, external and internal traffic situation, the technical and economical state of development in the economic region, the size of the company • location determination theory as spatial economy theory • theories and methods of determining the ideal locations for distributing and processing companies in agriculture and the food industry • methods of determining the ideal division of labour and vertical interrelations		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60: lecture: 30, tutorial: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, tutorial work Mark: written examination (50%), tutorial work (50%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/Regionalplan/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 43	**Taxation Management and Auditing in the Agro-Food Industry**	**3rd sem.**	**6 CP**
Module	Taxation Management and Auditing in the Agro-Food Industry		
Module code	MP 43		
Faculty/Chair/Department	FB09/Agribusiness Management/Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can work on and solve typical tax issues and estimations on their own; • are able to solve problems of tax and trade balance policy independently; • are capable of completing agricultural, silvicultural and land evaluation assessments appropriately; • have a deep understanding of fiscal assessment problems and can find a specific solution to those problems.		
Module content	• introduction to economical fiscal studies • crucial points of fiscal law, tax code, assessment laws, income tax and VAT regulations • trade and tax balance sheet • cadastral field, surveyors, land evaluation, land transactions, rights of use • compensation agreements, traffic investigation, hereditary right		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 45, tutorials: 15		
Ab Preparation/revision	40: consisting of: lecture: 30, tutorials: 30		
B Autonomous work	50 comprising a written assignment		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, written assignment Mark: written examination (50%), written assignment (50%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/foodeconomics/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 44	**Rural Institutions**	**3rd sem.**	**6 CP**
Module	Rural Institutions		
Module code	MP 44		
Faculty/Chair/Department	FB09/Agricultural and Environmental Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can consider the relationship between agriculture and society from an institutional, economic and sociological point of view; • shall gain the ability to recognise how human actions are determined in the social context and how institutions can be explained economically and sociologically; • can recognise the interactions between the individual and society and get to know methodical approaches for explaining the structure of rural societies; • have knowledge of the circumstances in rural societies and can employ various social theories on employment, rural, credit, and input markets		
Module content	Economy of the development of rural institutions and scope for design in agricultural policy (2 lecture hours) • essential points and demands on agricultural regulations regarding transaction costs • efficient institutions and rural forms of organisation • work and countryside: the theory of "share cropping" • land and property tax: Possibilities as compared to international standards • land policies and land reforms • relevance of public goods for agriculture • institutional regulations on rural credit markets • water rights and technology • comparison of agricultural regulations in different countries • problems with institutional change Institutional problems related to agricultural transition in rural areas (2 seminar hours on different topics) • interaction between the individual and social institutions • community and society • theories of social change and impact on the agricultural sector • rights of disposal and use • theories of social justice and acquisition of basic pension • labour constitutions; ground constitutions; ownership of grounds • rural system of values • rural health and welfare systems in historical comparison • traditional social security systems • sovereignty; rural vision of life and town-country relationships		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	60 consisting of: lecture: 30, seminar: 30		
B Autonomous work	30: seminar		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (30 mins) Mark: oral examination (60%), presentation (40%) Respective part of the examination Oral examination		
Frequency, duration in semesters	Winter semester, twice annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German/English		

Homepage: http://www.uni-giessen.de/cms/fbz/fbr09/institute/iam/pau

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 46	**Process Technology in Land Use**	**3rd sem.**	**6 CP**
Module	Process Technology in Land Use		
Module code	MP 46		
Faculty/Chair/Department	FB09/Agricultural Technology/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can develop land appropriately because of their knowledge and systematic understanding of ground, water and air; • have knowledge of reference variables according to law and business need whilst doing this.		
Module content	Effects of differentiated cultivation systems on: • parameters of agricultural engineering and industrial engineering • hysical, chemical and biological soil parameters • plant cultivation and economic harvest parameters • ecology and environment • optimisation of seeding, harvesting and storage technology • cost analysis of cultivation systems and mechanisation strategies • impact of the soil conservation law and EU law • inclusion and comparison of international scientific studies		
Form(s) of instruction	Lecture (36%), tutorials (24%), excursion (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	100 consisting of: lecture: 36, tutorial: 24, excursion: 40		
Ab Preparation/revision	20 consisting of: lecture: 10, tutorial: 10		
B Autonomous work	30: presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar work and oral examination Mark: seminar work (75%), oral examination (25%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	35		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 47	**Resource Economics and Environmental Management**	**2nd sem.**	**6 CP**
Module	Resource Economics and Environmental Management		
Module code	MP 47		
Faculty/Chair/Department	FB09/Agricultural and Environmental Policy/Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have fundamental knowledge in modelling intertemporal optimisation of agricultural resource utilisation; • understand the basics of management concepts towards the resolution of resource use conflicts; • can simultaneously model ecological and economic material cycles; • can depict dynamic processes of resource regeneration; • can construct computer simulation models; • can derive economically and ecologically justifiable extraction rates from soil, water, and biotic resources; • can draw knowledge of such concepts as sustainability, the introduction of save minimum standards, etc. to aid efforts in resource management.		
Module content	• intertemporal optimisation and resource usage • economics of non-renewable resources • economics of renewable resources • open access property and extinction of species as biotic resources • nature conservation as common property management • introduction to the economics of sustainable cultivation • mathematical formulation of resource management models • programming of optimisation models • management of cultivated landscapes • trade and the environment • political questions about the implementation of environmental policies • international questions of resource protection • resource evaluation • property rights and institutions		
Form(s) of instruction	Lecture (66%), seminar (13%), tutorials (20%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	110		
Aa Contact hours	60 consisting of: lecture: 40, exercise: 8, seminar: 12		
Ab Preparation/revision	50		
B Autonomous work	30		
C Final module examination	40		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: PowerPoint presentation and attendance, written examination Mark: PowerPoint presentation and attendance (30%), written examination (70%) Respective part of examination Respective part of examination		
Frequency, duration in semesters	Summer semester, annually		
Recommended standing	2nd semester		
Intake capacity	30		
Language of instruction	English and German		

Homepage: http://www.uni-giessen.de/cms/fbz/fbr09/institute/iam/pau

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 48	**Municipal Regional and Environmental Planning: Research Project**	**2nd sem.**	**6 CP**
Module	Municipal Regional and Environmental Planning: Practical Research Project		
Module code	MP 48		
Faculty/Chair/Department	FB09/Project and Regional Planning / Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • learn team work in practical projects; • can evaluate the planning contents, responsibilities and planning processes of the most important regional and environmental plans; • can estimate the effects and implement success controls; • can work on problems on site and independently; • can develop and assess problem-solving approaches in rural communities; • can present and defence the selected topic and discuss solutions with local players and regional planning agencies.		
Module content	• area development under the influence of market-based forces, political measures and regional planning • representation and evaluation of communal planning: urban land use planning, landscape planning, EIA, interference equation rule, environmental audit, local agenda, integrated rural development concepts • detection and evaluation of the infrastructure and supply situation, e.g. education, pension scheme and nursing care, nutrition, cultural institutions • methodology: evaluation of the situation, interrogation of the players and local population, development of possible solution strategies, consideration and assessment of recommendations • development of a questionnaire and carry out interviews about the public opinions • creating a report on guidance for the council (teamwork) • presentation of the results in front of key persons in the council, and discussion		
Form(s) of instruction	Guided project work (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	20		
Aa Contact hours	10		
Ab Preparation/revision	10		
B Autonomous work	140		
C Final module examination	20		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written project work, oral presentation Mark: project work (60%), presentation (40%) - Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/Regionalplan/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 49	**Distribution, Genesis and Conservation of Tropical and Subtropical Soils**	**2nd sem.**	**6 CP**
Module	Distribution, Genesis and Conservation of Tropical and Subtropical Soils		
Module code	MP 49		
Faculty/Chair/Department	FB09/Soil Science and Soil Conservation/ Institute for Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/ 2nd semester; Geography diploma/6th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BK 04 A (Soil Science component), BP 64 (Ecologic al Soil Functions)		
Learning outcomes	The students • can develop basic concepts for food and environmental security in the tropics and subtropics on the basis of their knowledge of the development, characteristics and endangerment of tropical and subtropical soils; • can explain the causes of different forms of soil degradation in the tropics and subtropics as well as develop and assess conservation and rescue strategies; • can describe subtropical and tropical soils using the example of relict weathering profiles widespread in Hesse, as well as interpret them genetically and locationally.		
Module content	Lecture: • geography, landscape ecology and soil dissemination in the subtropics and tropics, soil system principles • soil-forming processes and soils in tropical and subtropical climate areas: genesis, spread, local characteristics and use, chemical degradation, erosion and desertification as well as options for protection Field seminars: • excursion to Vogelsberg and Hintertaunus for investigating, describing and interpreting analytical data on tropical relict soils		
Form(s) of instruction	Lecture (70%), terrain seminar (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 40, seminar: 20		
Ab Preparation/revision	90: lecture		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (60 mins.), seminar work Mark: written examination (70%), seminar work (30%) Written examination Written examination (60 mins)		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fbr09/institute/bkbe/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 50	**Soil Informatics**	**2nd sem.**	**6 CP**
Module	Soil Informatics		
Module code	MP 50		
Faculty/Chair/Department	FB09/Soil Science and Soil Conservation/Institute for Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester, Geography diploma/6th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BKA 04, BKA 09, BP 64		
Learning outcomes	The students • can assess pedological analysis methods on their data quality and range; • can interpret pedological analysis data genetically and in regard to location, make up the balance of material contents and process the data (geo)statistically; • have knowledge of and can make use of external soil databases.		
Module content	Lecture and tutorials: • collection of pedological profile and areal data • collection, evaluation and options for graphical realisation, as well as statistical processing of pedological data • implementation of mass balance for the identification of material flow • implementation of analysis data on soil functions • collection of soil information from accessible soil maps and databases with external soil databases (e.g. "BoFa" of the Hessian State Office for Environment and Geology) • comparing laboratory data with results from mapping • interpretation and plausibility check		
Form(s) of instruction	Lecture (30%), tutorials (70%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 20, tutorial: 40		
Ab Preparation/revision	90 consisting of: lecture: 30, tutorial: 60		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Limited (15 participants)		
Language of instruction	German		

Term: see timetable
Required literature: see semester noticeboard

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 52	**Material Flow Analysis and Management**	**3rd sem.**	**6 CP**
Module	Material Flow Analysis and Material Flow Management		
Module code	MP 52		
Faculty/Chair/Department	FB09/Waste and Resource Management/ Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can deal with balancing production and consumption processes in industry and agriculture; • can give their view on the ecological and economic evaluation of input/output balances on different scale levels in industry and administration; • know instruments for controlling and optimising material flow balances in different production areas; • are acquainted with the necessary legal and non-legislative framework conditions; • have knowledge of different quality management systems.		
Module content	• legal conditions and standardisation • balancing models and their boundary conditions • generating eco-balances on different scale levels and with different environmentally relevant balancing factors • economic and ecological assessment of material flow balances in theory and practice • product and waste controlling, environmental audit and quality management • written report of iterative corrective and controlling measures		
Form(s) of instruction	Lecture (50%), seminar (25%), excursion (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lectures: 30, tutorial and excursion: 15, seminar: 15		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (67%), seminar contribution (33%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 53	**Models of Environmental Processes**	**3rd sem.**	**6 CP**
Module	Models of Environmental Processes		
Module code	MP 53		
Faculty/Chair/Department	FB09/Waste and Resource Management/ Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Knowledge of Soil Physics		
Learning outcomes	The students • are capable of distinguishing the structure of different empirical and deterministic simulation models in the environmental field; • are experienced in applying one and two dimensional simulation models and interpreting the results; • can evaluate different solution approaches; • know the definition of boundary conditions and parameter identification; • can create their own simulation model.		
Module content	• key issues in the construction of simulation models • numerical solution methods • application of different simulation models for water, material, heat and gas transport in the ground and landfill bodies • sensitivity analyses • comparing measured and calculated data • creating one's own simulation model in a tutorial		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lectures: 30, tutorial: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (30 mins) Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	20		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 54	**Soil Inventory**	**2nd sem.**	**6 CP**
Module	Soil Inventory		
Module code	MP 54		
Faculty/Chair/Department	FB09/Soil Science and Soil Conservation/ Institute for Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Pedological basics from module BKA 04 and comparable previous knowledge		
Learning outcomes	The students • can conduct large-scale soil mappings and analyse soil maps appropriately in order to apply this knowledge e.g. in landscape planning (engineering office) or in precision farming (agricultural consulting) or in the regional authorities responsible for official soil mapping; • can conduct procedures and methods for a large-scale regionalisation of soil characteristics and their spatial interpretation.		
Module content	• terrain methods of large-scale soil inventory • procedures for the large-scale regionalisation of soil characteristics • pedological mapping exercises in the field		
Form(s) of instruction	Lecture (25%), seminar (25%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 15, seminar: 15, tutorial: 30		
Ab Preparation/revision	70 consisting of: lecture: 10, seminar: 10, tutorial: 40		
B Autonomous work	20: tutorial		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination and participation in seminars and tutorials as well as producing a soil map with report Mark: oral examination and participation in seminars and tutorials (50%) as well as producing a soil map with report (50% Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	12		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/bkbe/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 55	**Environmental Analysis**	**3rd sem.**	**6 CP**
Module	Environmental Analysis		
Module code	MP 55		
Faculty/Chair/Department	FB09/Institute for Landscape Ecology and Resource Management/Institute for Soil Science and Soil Conservation		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can work independently on an issue of environmental analysis from sampling via conditioning, analysis through to interpretation; • know the current methods of instrumental environmental analysis and can apply these methods; • are acquainted with environmental law with regards to substance-related environmental pollution.		
Module content	Lecture: • core points of environmental analysis in the most important abiotic and biotic environmental media • backgrounds of chromatographic and spectroscopic methods Practical tutorial: • sampling and sample conditioning • extraction processes • chromatographic processes • spectroscopic processes • analysis interpretation		
Form(s) of instruction	Lecture (20%), practical tutorials (80%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 12, practical tutorial: 48		
Ab Preparation/revision	90 consisting of: lecture: 20, practical tutorial: 70		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (30 mins) Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fbr09/institute/bkbe/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 56	**Diagnostics in Environmental Microbiology**	**3rd semester**	**6 CP**
Module	Diagnostics in Environmental Microbiology		
Module code	MP 56		
Faculty/Chair/Department	FB09/The Microbiology of Recycling Processes/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	All FB09 master's degree courses/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Applied and Environmental Microbiology (BKU 34) or Food Microbiology (BP 92) recommended		
Learning outcomes	The students • can handle the key issues of microbiological diagnostics and know quality standards and means of control in environmental protection engineering as well as of food microbiology; • learn about the procedures of bacterial quantification and qualification with methods both dependent and independent on cultivation.		
Module content	• hygiene, control of contagious diseases, disinfection, sterilisation • bacteriologic quality control of food, drinking water, bathing waters, sewage and air (legal basis and standards), microbiological diagnostics (classical and molecular biological methods in the context of quality control measures), microbial pollution in food and the environment, in everyday life and the work environment (legal basis and standards) • quantification and qualification of biotechnologically important microorganisms; enrichment of physiologically specialised microorganisms (nitrifying bacteria, denitrifying bacteria), identification of bacteria with classical and molecular biological methods; enzyme detection, bacteriological investigations in the context of microbiological quality control		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lectures: 30, seminar: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/mikrobiologie/inst_home.html
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 58	**Methods in Population, Vegetation and Landscape Ecology**	**2nd sem.**	**6 CP**
Module	Methods in Population, Vegetation and Landscape Ecology		
Module code	MP 58		
Faculty/Chair/Department	FB09/Landscape Ecology and Landscape Planning/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Ecology of Agricultural Landscapes (MKU 41), Landscape Development (MP 59)		
Learning outcomes	The students • know the essentials of population biology; • can set up and analyse population and vegetation ecological experiments; • know the most important methods of landscape ecological analyses; • can ordinate and classify vegetation surveys with computer programs.		
Module content	• essentials of population ecology • methods for collecting population, vegetation and landscape ecological data • design of experiments (sampling design, establishment of permanent plots) • experimental analysis (scaling of data and transformation, classification (cluster analysis), ordination) • analysis of spatiotemporal patterns • prediction and modelling of temporal development		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, tutorial: 30		
Ab Preparation/revision	60: lecture		
B Autonomous work	30: tutorial		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (15 mins), tutorial work Mark: oral examination (100%) Oral examination (15 mins), tutorial work Oral examination (15 mins), tutorial work		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

09-MP 59	**Landscape Development and Renaturation Ecology**	**1st sem.**	**6 CP**
Module	Landscape Development and Renaturation Ecology		
Module code	MP 59		
Faculty/Chair/Department	FB09/Landscape Ecology and Landscape Planning/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the ecological and landscaping methods for developing re-establishment and utilisation concepts; • can compile a care and development planning; • can judge the appropriate use of plants (trees, shrub-like plants, herbaceous plants, grass-like plants) for landscaping.		
Module content	• key aspects of using plant species and communities of plants as building and designing material • key aspects in the conservation of plant communities in agricultural landscapes • key aspects of the recovery and recreation of plant communities in the agricultural landscape (grassland, farmland, microstructures, groves, and hedges) • contents of care and development plans • compiling a care and development plan with appropriate plant use		
Form(s) of instruction	Lecture (50%), tutorials (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, tutorial: 30		
Ab Preparation/revision	90 consisting of: lecture: 60, tutorial: 30		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (45 mins), tutorial work Mark: written examination (100%) - Written examination (45 mins), tutorial work		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 60	**Microorganisms in Biogeochemical Cycles**	**2nd sem.**	**6 CP**
Module	Microorganisms in Biogeochemical Cycles		
Module code	MP 60		
Faculty/Chair/Department	FB09/Microbiology/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	All master's study programes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basic knowledge in microbiology required		
Learning outcomes	The students • gain deep knowledge about the activity of microorganisms in global cycles of C, N, S, and Fe; • gain insight into the decomposition of harmful substances; • gain theoretical knowledge about different quantitative methods for measuring microbial processes (photometry, GC, HPLC, stable and radioactive isotopes, microsensors); • gather practical experience in quantitative analytics; • can capture qualitatively and quantitatively the biogeochemical cycles at given locations.		
Module content	• metabolic physiology of the bacteria involved in biogeochemical cycles • fluxes between different compartments • detection principles of different analytic methods • decomposition of harmful substances by microorganisms, using concrete case studies • Global changes due to climate-relevant gases • process modelling		
Form(s) of instruction	Lecture (50%), practical laboratory course (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, practical laborarory course: 30		
Ab Preparation/revision	70 consisting of: lecture: 40, practical laboratory course: 30		
B Autonomous work	20: lecture		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, test as prerequisite for the laboratory course Mark: written examination (100%) - Written examination and test		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/mikorbiologie/inst_home.html

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 61	**Molecular Analysis of Complex Microbial Communities**	**3rd sem.**	**6 CP**
Module	Molecular Analysis of Complex Microbial Communities		
Module code	MP 61		
Faculty/Chair/Department	FB09/General and Soil Microbiology/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	All master's study programes in FB09/1st or 3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Fundamental knowledge in microbiology required		
Learning outcomes	The students • gain in-depth knowledge about different molecular methods for microbial diagnostic; • can capture the structure of populations in complex microbial communities with molecular and cultivation techniques; • understand the functional interactions between different groups of microorganisms; • can judge the needs of growth for different metabolic groups of microorganisms; • are able to understand and evaluate critically original and review articles from international journals within this subject.		
Module content	• principles of different molecular detection methods (PCR, molecular fingerprint methods, genomic and proteomic approach) • cultivation techniques for capturing different metabolic groups of microorganisms (aerobic, anaerobic cultivation techniques, dilution techniques, selective media, media for capturing as many microorganisms as possible) • recording the metabolic capacity of a location • structure of microbial food webs using selected examples in terrestrial and aquatic habitats • presenting the molecular and microbial characterisation of complex habitats (meadows, biofilms, rhizosphere, dietary tract of animals)		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, seminar:30		
Ab Preparation/revision	70 consisting of: lecture: 40, seminar: 30		
B Autonomous work	20: lecture		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, presentation Mark: written examination (100%), Any component of the examination Written examination and presentation		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Term: see timetable

Required literature: see semester noticeboard and lecture notes

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 63	**Management of Agroecosystems**	**3rd sem.**	**6 CP**
Module	Management of Agroecosystems		
Module code	MP 63		
Faculty/Chair/Department	FB09/Resource Management/ Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BP 76 (or other GIS knowledge)		
Learning outcomes	The students • know the most important starting points for agricultural ecosystem management which enable a gentle use of the landscape, permanently increase and ensure their utilisation potential; • know about the limited water resources and know water-saving methods of irrigation farming; • know different techniques in agricultural exploitation methods which serve the protection and conservation of landscape functions; • understand effects and side effects of those techniques and can assess them.		
Module content	• measures of soil protection, ground water protection, flood protection, water protection, erosion protection, plant protection, atmospheric protection • use of decision support systems (e.g. SWAT CROPWAT) • irrigation and drainage, water efficiency • cooperations as an instrument for ground water protection • regulatory contents of legal framework conditions (including Water Framework Directive, Cross Compliance) • completion of an independent scientific investigation using a decision support system • compilation of a final report with presentation		
Form(s) of instruction	Lecture (30%), tutorials (70%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 20, tutorials: 40		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: s presentation and final report Mark: presentation and final report - Resubmission of final report		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	20 (number of PC stations available)		
Language of instruction	German		

Homepage: see Stud.IP
Required literature: see Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 64	**Nutritional Ecology in Research**	**4th sem.**	**6 CP**
Module	Nutritional Ecology in Research		
Module code	MP 64		
Faculty/Chair/Department	FB09/Nutritional Ecology/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have deep knowledge about the complexity, interconnectedness, dynamics etc. in the nutrition sector; • know different research and thought approaches for solving nutrition-related problems; • are able to recognise and illustrate the diverse impact of changes in the nutrition sector; • can elaborate sustainable/nutritional ecological solution approaches; • are able to link and integrate current research findings from different disciplines; • can bring theoretical nutritional knowledge and knowledge about different research approaches and thought impetuses together and develop problem-solving approaches from these; • know ways of implementing solution approaches.		
Module content	• nutrition-associated examples from the latest sustainability research • approach to socioecological research, aspects of gender-sensitive t • approaches to complexity research and its applicability to nutrition-linked problems • epistemological backgrounds to nutritional research • model approaches to the nutritional system • examples for integrative problem-solving approaches in the nutritional system • instruments and methods for an ecological, economic and social assessment of food • methods for inter/transdisciplinary knowledge integration • method approaches for dealing with complexity (e.g. simulations, business games, scenarios)		
Form(s) of instruction	Lecture (30%), seminar (60%), excursion (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: seminar: 36, lecture: 18, excursion: 6		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: 1. regular and successful participation in the module 2. oral examination on module content, 3. presentation Mark: oral examination (50%), participation in module (including presentation 50%) All components of the mark must be at least "sufficient" Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/nutr-ecol/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 65	**Analysis and Assessment of Complex Nutrition Aspects**	**3rd sem.**	**6 CP**
Module	Analysis and Assessment of Complex Nutrition Aspects		
Module code	MP 65		
Faculty/Chair/Department	FB09/Nutritional Ecology/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None, last part of studies		
Learning outcomes	The students • can analyse complex nutritional topics, evaluate them nutritionally and establish them in a bigger context; • can link knowledge from the different dimensions of nutrition in a problem-related way; • are able to transfer complex nutritional topics to qualitative/semi-qualitative models; • know the essential points of transdisciplinarity; • can review complex nutrition-related contexts for academic publications/presentations.		
Module content	• application of instruments for dealing with nutritional complexity • research approaches for capturing complex links in the nutritional system • transdisciplinary research approach and thought impetus for working on complex nutritional problems • developing strategies for solving complex nutritional problems • cooperative writing as an option for nutrition-related knowledge integration • approaches to qualitative and semi-quantitative modelling of knowledge synthesis		
Form(s) of instruction	Lecture (10%), seminar (50%), tutorials (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	70		
Aa Contact hours	60 consisting of: seminar: 30, lecture: 6, tutorial: 24		
Ab Preparation/revision	10		
B Autonomous work	80		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: 1. regular and successful participation in the module 2. project work 3. module participation (including presentation in tutorial) Mark: project work (50%), participation in module (including presentation (50%) All components of the mark must be at least "sufficient" Oral examination Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/nutr-ecol/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 68	**Food Toxicology**	**1st sem.**	**6 CP**
Module	Food and Environmental Toxicology		
Module code	MP 68		
Faculty/Chair/Department	FB09/Food Science/State Laboratory of the Land of Hessen		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basic knowledge in food toxicology, food chemistry, biology and biochemistry, anatomy and physiology, nutritional physiology		
Learning outcomes	The students • know the relevant impurities of natural origin, residues, contaminants and impurities which emerge during the preparation or through inappropriate treatment of food; • know and understand toxic mechanisms of action; • are able to conduct risk estimations for the intake of impurities with food; • are able to evaluate impurities and their potential impact on health and environment; • know and understand the usual chemical-analytical measuring methods and can evaluate and assess analytic measurement results; • can estimate the potential risk caused by impurities in food, also on the basis of food regulations, and can take advisory and preventing action regarding this topic.		
Module content	• impurity metabolism, detoxification and toxification • chemical carcinogenesis • occurrence, biological properties and toxicological evaluation of residues and contaminants which can be found in food and in the environment • occurrence and qualities of natural toxins and impurities which emerge during the preparation of food or through incorrect storage • official food control and food regulations • common methods in food analytics (thin layer chromatography, liquid chromatography, gas chromatography, mass spectrometry) • evaluation and assessment of analytical measurement results; analytical quality assurance • risk identification, risk quantification, risk communication and risk management of potentially toxic impurities		
Form(s) of instruction	Lecture (40%), seminar (60%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, seminar Mark: oral examination (60%), seminar (40%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	35		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/food/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 69	**Empirical Research Methods in Food Marketing**	**2nd sem.**	**6 CP**
Module	Empirical Research Methods in Food Marketing		
Module code	MP 69		
Faculty/Chair/Department	FB09/Agribusiness Management/Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Principles of statistics, fundamental knowledge of marketing		
Learning outcomes	The students • understand the relationships between theoretical explanatory approaches and empirically proven patterns of consumer behaviour concerning Fast Moving Consumer Goods; • have extensive knowledge of empirical research methods and using them in marketing practice; • are able to apply scientific methods to practical problems of food marketing; • know how to assess quantitative and qualitative methods of market research and can demonstrate possibilities of further development.		
Module content	• the methodological debate on empirical research: Quantitative vs. qualitative research • multivariate analysis methods (cluster, discriminant, causal, conjoint and discrete choice analyses) • methods of operational advertising appeal and effectiveness control • relaunch processes for introduced products • customer connectivity strategies and brand management • behavioural Pricing methods • explanatory models of consumer behaviour		
Form(s) of instruction	Lecture (50%), seminar (25%), PC tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	180		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 15, tutorial: 15		
Ab Preparation/revision	120 consisting of: lecture: 60, seminar: 30, tutorial: 30		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (50%), seminar (50%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Term: see timetable

Required literature: see semester timetable and lecture notes

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 70	**Methods of Molecular Nutrition Research**	**1st sem.**	**6 CP**
Module	Methods of Molecular Nutrition Research		
Module code	MP 70		
Faculty/Chair/Department	FB09/Molecular Nutritional Research/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • understand chromatography and molecular-biological methods and can describe them; • understand the principles of regulating cellular activities on a genetic and protein level; • are able to consider nutrition-related diseases in the context of molecular nutritional research; • can prepare a selected topic independently, produce a paper and present the topic.		
Module content	• methods for determining food constituent effects on a cellular, genetic and protein level • polymorphisms as determinants of nutrition-related diseases • polymorphisms as determinants of pharmaceutical effects • nutrient pharmaceutical interactions • dose-effect relationships of food constituents		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	60 consisting of: preparation: 30, revision: 30		
B Autonomous work	30: work in small groups		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination (90 mins) Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/mol-nutr-res/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 71	**Protein Biochemistry of Plants**	**3rd sem.**	**6 CP**
Module	Protein Biochemistry of Plants		
Module code	MP 71		
Faculty/Chair/Department	FB09/Biochemistry of Plant Nutrition/Institute for Plant Nutrition		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • understand the assimilation of nitrogen and sulfur in plant metabolism; • gain deep knowledge of biosynthesis, function and decomposition of proteins in plants; • can assess the methods for the segregation and identification of proteins.		
Module content	• nitrogen and sulphur assimilation in plants • biosynthesis and decomposition of amino acids • biosynthesis and structure of proteins • folding, segregation and modification of proteins • functions of proteins in plant metabolism • enzyme kinetics and enzyme regulation • proteomics of crop plants		
Form(s) of instruction	Lecture (75%), seminar (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 45, seminar: 15		
Ab Preparation/revision	60		
B Autonomous work	30 (presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination and seminar work Mark: written examination (75%), seminar work (25%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/plant-nutrition/
Required literature: see Stud.IP and department website

09-MP 72	**Bioavailability**	**4th sem.**	**6 CP**
Module	Bioavailability		
Module code	MP 72		
Faculty/Chair/Department	FB09/Human Nutrition – Physiological Evaluation of Food/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Nutrition and Metabolism (MKE 42 W)		
Learning outcomes	The students • understand the relevance of bioavailability (BA) of nutrients; • can evaluate the factors which influence the BA; • have deep knowledge of the methods for determining the BA in-vivo in humans; • have deep knowledge of the kinetics of nutrients and impurities during ingestion, transportation and expulsion; • are able to create compartment models and conduct the corresponding calculations and evaluations.		
Module content	• importance of velocity and the extent to which an input micro or macronutrient is available at the target location • differences of BA (individual, circadian rhythm and others) • absorbability (measure for intake of nutrients from the food to the mucosa cell) and other factors which influence the BA equations) • quantitative capture of the first pass effect of the liver with the help of mathematical models • BA as a prerequisite for statements about the recommended intake of nutrients, about the fulfilment of need and about prevention both of malnutrition and super nutrition • BA as a means for producing very efficient food		
Form(s) of instruction	Seminar and presentations (75%), small groups (PC work) (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	90		
Aa Contact hours	60 consisting of: seminar: 30, presentations: 15, group PC work: 15		
Ab Preparation/revision	30 consisting of: preparation: 15, revision: 15		
B Autonomous work	60: tutorial and model calculation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar work and oral final examination Mark: seminar work (25%), oral examination (75%) - Oral examination		
Frequency, duration in semesters	Summer semester and winter semester, annually 1 semester		
Intake capacity	Max. 16 depending on PC places		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/kunz

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 73	**Controlling of Personal Service Institutions and Public Administrations**	**3rd sem.**	**6 CP**
Module	Controlling of Personal Service Institutions and Public Administrations		
Module code	MP 73		
Faculty/Chair/Department	Faculty 09 / Management of Services for Persons / Institute for Household Economy and Consumer Research		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have deep knowledge of the instruments and methods of controlling, • have an overview of the management of personal and public service institutions, • can apply the instruments and methods of controlling to personal and public service institutions, • can assess and optimise economic decisions in personal and public service institutions, • have an overview of international developments.		
Module content	• instruments and methods of controlling • performance-related and financial functions of personal service institutions • characteristics of controlling in personal service institutions • performance-related and financial functions of public administrations • characteristics of controlling in public administrations		
Form(s) of instruction	Lecture (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, annually, 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fb09/home/braeunig/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 74	**Demoscopic Market Research**	**3rd sem.**	**6 CP**
Module	Demoscopic Market Research		
Module code	MP 74		
Faculty/Chair/Department	FB09/Market Analysis-Institute for Agricultural Policy and Market Research		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the key methodical issues in demoscopic market research and their possible applications in the agricultural and food industry; • can conduct components of an empirical market research study on the basis of demoscopic methods and summarise them as a written assignment in groups.		
Module content	• introduction to fields research in market research: inquiry methods, scaling, sampling • surveys and observations in market research • theories of experimental market research • analysis of primary data in market research using non-econometric methods: inductive statistics; factor analysis, cluster analysis etc. • connection of demoscopic and econometric market research considering qualitative dependent variables: logit, probit, and tobit models • conducting a market research study on the basis of the fields research methods acquired and multivariate analysis in supply, demand, price or competition analysis • components of the demoscopic market research study in student groups		
Form(s) of instruction	Lecture (70%), study project (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60: lecture		
Ab Preparation/revision	60		
B Autonomous work	30: study project		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, group work Mark: written examination (70%), group work (30%) Written examination (70%), group work (30%) Written examination (70%), group work (30%)		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/~gh1313/apopr1.htm
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 75	**Host-Intestine-Microbe Interactions for Nutrition and Health**	**2nd/4th sem.**	**6 CP**
Module	Host -Intestine - Microbe Interactions for Nutrition and Health		
Faculty/Chair/Department	FB09 General and Soil Microbiology/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basic knowledge in microbiology		
Learning outcomes	The students: • have an overview over morphology and function of various digestive systems; • have knowledge of commensalistic, mutualistic and pathogenic bacteria; • understand the survival and adhering strategies of microbes in the intestine and the microbial primary and secondary metabolism (vitamin and toxin production); • gain an insight into microbe interactions with epithelial and paneth cells and about cell mediated immunity; • gain knowledge about the effect of flavonoids and other nutritional compounds; become familiar with features of probiotic bacteria and bacteria causing food contamination; • have practical experience with techniques to quantify and evaluate probiotic bacteria and prebiotic product.		
Module content	• intestinal systems of humans, ruminants and insects • physiology and interactions of bacteria in the intestine • cell mediated immunity • role of flavonoids and other nutritional compounds • methods for cultivation or microorganismens, identification of bacteria, experiments testing bacterial survival and growth under conditions of food conservation and of the gastrointestinal system		
Form(s) of instruction	Lecture (50%), practical laboratory as blocked course (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: lecture: 30, lab. course: 30		
Ab Preparation/revision	70 consisting of: lecture: 70, lab. course: 30		
B Autonomous work	20: lecture		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, examination in laboratory course (each part must be at least "sufficient") Examination (100%) Relevant part of examination		
Frequency, duration in semesters	Block course after summer semester teaching period 2 weeks		
Recommended standing	2nd or 4th		
Intake capacity	30		
Language of instruction	English		

Term: see timetable

Recommended literature: see semester noticeboard

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 76	**Laboratory Course: Tissue Culturing and genetic Transformation**	**3rd/4th sem.**	**6 CP**
Module	Laboratory Course: Tissue Culturing and Genetic Transformation		
Module code	MP 76		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd and 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Molecular Phytopathology (MK 57), Plant Protection and Bioengineering (MK 15)		
Learning outcomes	The students • have broad knowledge of various processes in the field of biotechnology of agricultural products; • have fundamental knowledge of the methods, strategies, and laboratory techniques for plant and microbe transformation; • have fundamental knowledge of the methods, strategies, and laboratory techniques for plant tissue culturing; • know fundamental principles of using reporter gene constructs; • are able to develop strategies to transform cereal crops; • can understand problems related to genetic transformation of crop plants, and identify the risks involved in this strategy; • have fundamental knowledge in risk assessment, environment protection, farmer and consumer protection, and food security.		
Module content	• development of guidance for risk management in genetically engineered plant and microorganisms • evaluation of suitability of plant transformation • practical training in plant transformation techniques • practical training in microbe transformation techniques • practical training in tissue culturing techniques • practical training in detection of transgenes by molecular and cell biology techniques • practical training in reporter gene use in plant transformation • practical training in confocal laser microscopy • practical training in transgene function assessment • release and marketing of genetically modified organisms		
Form(s) of instruction	Lecture (20%), exercise (80%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 5, seminar: 5, exercise: 50		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination and experimental success; each part must be sufficient Mark: oral examination (50%), experimental success (protocol) (50%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester 2 weeks full time laboratory course		
Recommended standing	3rd and 4th semester		
Intake capacity	14		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz
Required literature: see Stud.IP

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 77	**Laboratory Course: Plant Pathogens and Symbiotics**	**3rd/4th sem.**	**6 CP**
Module	Laboratory Course: Plant Pathogens and Symbiotics		
Module code	MP 77		
Faculty/Chair/Department	FB09/Phytopathology/Institute of Phytopathology and Applied Zoology		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Molecular Phytopathology (MK 57), Plant Protection and Bioengineering (MK 15)		
Learning outcomes	The students • have broad knowledge in parasitism and mutualism in interactions of microbes and plants; • know fundamental principles of molecular cloning and related laboratory techniques; • are able to develop strategies to clone genes from plants and microbes; • are able to detect gene activity on mRNA and protein levels; • are able to apply techniques for gene function evaluation; • are able to detect and determine plant pathogens; • have broad taxonomic knowledge for plant pathogens and endophytic symbionts; • are able to use up-to-date microscopic techniques.		
Module content	• practical training in plant and microbe gene cloning methods • practical training in detection methods of genes • practical training in taxonomic evaluation methods for plant pathogens and symbionts • practical training in bioinformatics related to taxonomic and diagnostic matter • practical training in light and CLs microscopy methods		
Form(s) of instruction	Lecture (10%), seminar (20%), exercise (70%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 5, seminar: 5, exercise: 50		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar and experimental success; each part must be sufficient Mark: written examination (50%), seminar + experimental success (50%) Oral examination Oral examination		
Frequency, duration in semesters	Winter semester 2 weeks full time laboratory course		
Recommended standing	3rd or 4th semester		
Intake capacity	14		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz

Required literature: Buchanen et al.; *Maniatis: Laboratory Manual*

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09-MP 78	**Land Use and Environmental Impact**	**2nd sem.**	**6 CP**
Module	Land Use and Environmental Impact		
Module code	MP 78		
Faculty/Chair/Department	FB09/Resource Management/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • can assess the influences of different forms of land use on natural resources like water, ground and air; • can evaluate the effects of changed environmental conditions, in particular Global Change, on natural resources; • can accurately characterise the reasons and extent of ecological damage and negative impact on protected resources.		
Module content	• land use and its effects on the natural resources of water, ground and atmosphere • impact of changed environmental conditions (climate change) on land use and natural resources • ecosystem functions • evaluation concepts for land use (multifunctionality, sustainability) • exercises for academic work (literature research/literature management, structuring academic texts, creating worksheets, charts and images, writing a summary)		
Form(s) of instruction	Lecture (20%), seminar (50%), tutorials (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	Lecture: 20, presentation: 20, tutorials: 20		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation with report Mark: presentation with report - Resubmission of report		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	30		
Language of instruction	German		

Homepage: see Stud.IP
Required literature: see Stud.IP

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09-MP 80	**Methodological Basics in Behavioural Research**	**2nd sem.**	**6 CP**
Module	Methodological Basics in Behavioural Research		
Faculty/Chair/Department	FB09/Nutrition Education and Consumer Behaviour/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • gain an understanding of quantitative and qualitative nutritional research; • know methods and survey tools for analysing nutritional and consumer behaviour data by statistical processes and tests; • conduct a small exemplary survey (development of the instrument, implementation of the survey, analysis); • learn the main points of evaluation research; • can present the results of their own surveys by oral presentation or poster.		
Module content	• main points of quantitative nutritional research from a social scientific point of view • main points of qualitative nutritional research from a social scientific point of view • survey (written, telephonic, interview), observation, experiment, secondary analysis • forms, characteristics, peculiarities, and possible applications of individual instruments • project work in groups: implement own survey (planning, development, interpretation and data analysis) • presentation of the results with posters/PowerPoint presentations • application of different forms of evaluation		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: final module examination (written examination) Mark: final written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	20		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/ebbv/
Required literature: see Stud.IP and information in lecture notes

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 81	**Milk Production and Processing**	**1st/3rd sem.**	**6 CP**
Module	Milk Production and Processing		
Module code	MP 81		
Faculty/Chair/Department	FB 09/Animal Husbandry and Biology of Husbandry/Institute for Animal Breeding and Genetics		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Agricultural Sciences, BSc Home Economics, BSc Nutritional Sciences		
Learning outcomes	The students • have deep knowledge about the physiology of lactation, milking as well as milk storage and processing; • can provide optimal operation of milking processes; • can explain methods for treating milk and producing valuable milk products.		
Module content	• anatomy and physiology of lactation • key issues in milking • structure, function and control of milking processes • udder health and indicators of disease • milk processing		
Form(s) of instruction	Lecture (60%), tutorials (25%), excursion (15%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 36, tutorial: 16, excursion: 8		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Winter semester, block course, annually 1 semester		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/tierzucht/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 83	**Professional Techniques of Conversation and Moderation**	**2nd/3rd sem.**	**6 CP**
Module	Professional Techniques of Conversation and Moderation		
Module code	MP 83		
Faculty/Chair/Department	FB09/Agricultural Sociology/Institute for Agricultural Sociology and Extension		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the principles of building relationships and working with conversational content; • know and understand methods of building and structuring group work; • have practised and reflected upon building relationships; • created groups by themselves and reflected upon group processes.		
Module content	• approaches to building relationships and mediating the content of conversations • working methods and process design in groups		
Form(s) of instruction	Block training		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60: training		
Ab Preparation/revision	118: training consisting of preparation: 98, revision: 20		
B Autonomous work	-		
C Final module examination	2		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: and written examination, written assignment, presentation and performance Mark: written examination (40%), written assignment, presentation and performance (30%) Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	18		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/kub/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 84	**Project in Landscape Ecology**	**1st sem.**	**6 CP**
Module	**Project in Landscape Ecology**		
Module code	MP 84		
Faculty/Chair/Department	FB09/Landscape Ecology and Landscape Planning/Institute for Landscape Ecology and Resource Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	MKU 05, MKP 07, MP 59		
Learning outcomes	The students • gain advanced skills in applying acquired knowledge of landscape ecology; • acquire skills in analysing problems and transferring solutions; • can gather biodiversity-related data (from literature, in the field and with the help of geographical information systems), document them and interpret them in written form; • can independently create reports and a poster from the results independently.		
Module content	• The Landscape Ecology project module prepares students for the work on their master thesis. • A subject area of landscape ecology related to biodiversity will be addressed intensively. • Problems relating to the subject will be deduced from existing and additional data, • For concrete case studies, solutions will be developed; in order to do this, abiotic, biotic, economic and other planning-relevant data will be gathered, analysed with geographical information systems and evaluated using statistical procedures. • The gathered data will be formulated as an advisory opinion and presented in a poster.		
Form(s) of instruction	Project study (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60		
Ab Preparation/revision	60		
B Autonomous work	30 (written summary including poster), 4 (poster presentation)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: poster presentation in front of the plenum (students, tutors, public) and written summary (incl. poster) Mark: written summary and presentation poster (100%) - Written summary and presentation poster		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/ilr/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 86	**Technology of Agricultural Special Crops**	**3rd sem.**	**6 CP**
Module	Technology of Agricultural Special Crops		
Module code	MP 86		
Faculty/Chair/Department	FB09/Agricultural Engineering/Institute for Agricultural Technology		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have knowledge of devices and methods for agricultural special crops; • can present and assess process aims and process optimisations for special agricultural crops; • are able to deploy their knowledge and comprehension to coordinate processes.		
Module content	• aims and tasks of the technology for special agricultural crops (extraction and processing) • legal aspects and quality management • process control in special crop production • process engineering of energy crops • process engineering of renewable resources • process engineering of healing and spice plants • process engineering of rough vegetables • process engineering of fruit production • process engineering of viniculture • file maintenance (planting, watering, harvesting, storage and processing)		
Form(s) of instruction	Lecture (45%), tutorials (15%), excursion (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	100 consisting of: lecture: 45, tutorial: 15, excursion: 40		
Ab Preparation/revision	30 consisting of: lecture: 15, tutorial: 15		
B Autonomous work	20: tutorial		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written or oral examination Mark: written or oral examination (100%) - Written or oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	50		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/pt/

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 87	**Global Nutrition and Agriculture**	**3rd sem.**	**6 CP**
Module	Global Nutrition and Agriculture		
Module code	MP 87		
Faculty/Chair/Department	FB09/International Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the determinant factors for food security and safety; • can estimate the regional need for food and the carrying capacity; • can evaluate the connection between health and nutrition; • have an overview of the structures and strategies of nutritional support.		
Module content	• food demand, natural resources and population • global nutrition as a problem of agricultural development • regional potentials of food production • technological development, institutions and formation of human capital • sectorial development strategies, agriculture and nutrition • commercialisation of agriculture, cash crop vs. food crop debate • international division of labour and food security • food (security) and health • migration and malnutrition • cultural, economic and nutritive determining factors • nursing and food security • food security and food aid • development aid approach • international organisations in food security and agricultural development		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	100		
Aa Contact hours	60 consisting of: lecture: 30, seminar:30		
Ab Preparation/revision	40		
B Autonomous work	50: presentation		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination and presentation Mark: written examination (67%), presentation (33%) Written examination Written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/int-nutr/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 88	**Economics of Personal Services Provided by Private Households and Institutions**	**2nd sem.**	**6 CP**
Module	Economics of Personal Services Provided by Private Households and Institutions		
Module code	MP 88		
Faculty/Chair/Department	Faculty 09 / Management of Services for Persons / Institute for Household Economy and Consumer Research		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have a comprehensive overview of the key methodical and theoretical aspects of creating personal services, • know the commonalities and differences between providing personal services by private households and institutions, • know personal service institutions as well as their functions and target groups, • can judge whether personal service objectives have been reached, • know the collaboration of private households and institutions in network.		
Module content	• objectives and systems of objectives in personal service institutions • economical behaviour in the context of efficiency and effectiveness • demand-oriented performance building • instruments and methods for designing recommendations for actions • concepts for integrating private households and personal service institutions		
Form(s) of instruction	Lecture (75%), tutorials (25%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 45, tutorial: 15		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually, 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/braeunig
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 89	**Technology, Space and Work in Everyday Personal Service Provision**	**4th sem.**	**6 CP**
Module	Technology, Space and Work in Everyday Personal Service Provision		
Module code	MP 89		
Faculty/Chair/Department	FB09/Economics of the Private Household and Family Studies/Institute for Household Economics and Consumer Research		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • know the development and impact of care service mechanisation; • can judge the extent to which alternative care arrangements meet demands; • know the basics of service design (stimulus concepts); • know the conditions for analysing and designing relevant production and work systems; • know the basics and framework conditions of labour organisation.		
Module content	• mechanisation of care and social work; relevance of space and technology for material production and services; aspects of service design; scopes of action and perception; milieu planning, milieu therapy • work system (terms, design and its conditions, labour organisation, working equipment design, work environment, legal framework)		
Form(s) of instruction	Seminar (60%), tutorials (40%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 40, seminar: 20		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: presentation with report, oral examination Mark: presentation with report (50%), oral examination (50%) Oral examination Oral examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://wi.uni-giessen.de/wps/fbr09/home/schneider
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 90	**Molecular Entomology**	**3rd sem.**	**6 CP**
Module	Molecular Entomology		
Module code	MP 90		
Faculty/Chair/Department	FB09/Applied Entomology/Institute for Phytopathology and Applied Zoology		
Associated degree course(s)/Semester	Master of Science Agrobiotechnology/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basic knowledge in zoology		
Learning outcomes	The students • learn basics in insect physiology; • get to know relevant applications of insect models in molecular biology; • are introduced to insect biotechnology; • learn to synthesise and prepare the seminar work on molecular entomology		
Module content	• basics of insect physiology • relevance of insect models in basic and applied molecular biology • molecular interactions between entomopathogens and the insect immune system • models and use of insect biotechnology		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS points	
Module composition: A Courses in total	150		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 30		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: marked 50% seminar, 50% examination Mark: marked written examination 50%, seminar 50% Current part of examination Oral or written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Recommended standing	3rd semester		
Intake capacity	Unlimited		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/ipaz/

Required literature: Hoy, *Insect Molecular Genetics: An Introduction to Principles and Applications, (Second Edition)*

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 91	**Wine – An interdisciplinary Course**	**2nd sem.**	**6 CP**
Module	Wine – An Interdisciplinary Course		
Module code	MP 91		
Faculty/Chair/Department	FB09/Oenology/Institute for Nutritional Science and Agricultural Policy and Market Research of the JLU, Geisenheim Research Institute Human Nutrition – nutrition-physiologic assessment of food		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • have a comprehensive understanding of wine; • gain specialised knowledge of wine; • understand the connections between different areas such as viniculture, genetics, chemistry, biochemistry, microbiology, oenology, sensor technology, economics and nutrition.		
Module content	• plant cultivation aspects of grape production • microbiology and biochemistry of wine making • principles of wine making • modern wine analytics • structure and development of global and EU wine markets and their determinants; wine quality and its influence on wine prices • nutritional evaluation of wine • relevance of ingredients to disease-preventive considerations		
Form(s) of instruction	Lecture with discussion (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90 consisting of: preparation: 30, revision: 60		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	Unlimited		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/kunz

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 92	**Nutrition Related Diseases and Prevention**	**2nd/4th sem.**	**6 CP**
Module	Nutrition Related Diseases and Prevention		
Module code	MP 92		
Faculty/Chair/Department	FB09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd or 4th semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Home Economics		
Learning outcomes	The students • can independently elaborate, present and discuss selected and current topics in human nutrition with the help of academic literature; • can classify nutritional studies and evaluate their validity; • have a deepened understanding of the connections between nutrition and selected chronic diseases; • are able to make specific dietary recommendations for the prevention of diseases.		
Module content	• selected current topics in nutritional science • dental health • physical activity • intestinal flora, food allergy and intolerance • diverticulosis • rheumatoid arthritis, cytokines • osteoporosis • cancer and other diseases • drug treatment and diet		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar contribution (presentations, exercises) and written examination Mark: module component seminar contributions (50%), written examination (50%) Seminar and written examination Seminar and written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	15		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 93	**Healthy Aging**	**1st/3rd sem.**	**6 CP**
Module	Healthy Aging		
Module code	MP 93		
Faculty/Chair/Department	FB09/Human Nutrition/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	BSc Nutritional Science or BSc Home Economics		
Learning outcomes	The students • have deepened knowledge of the interrelations between aging processes and human nutrition; • can assess intervention strategies; • can develop solutions for ensuring adequate nutrition for aging and old people; • know the current priorities in gerontology.		
Module content	• selected current issues in gerontology • age-dependent changes in organs and tissues • genetic aspects of aging • nutrition and aging • physical activity and aging • action strategies for healthy aging • from theory to practice		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	60		
Ab Preparation/revision	90		
B Autonomous work	-		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: seminar contributions (presentations, exercises) and written examination Mark: seminar contributions (50%), written examination (50%) Seminar and written examination Seminar and written examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	15		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/human-nutrition
Required literature: see Stud.IP and department website

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09-MP 94	**Economy and Production of Bioenergy**	**2nd sem.**	**6 CP**
Module	Economy and Production of Bioenergy		
Module code	MP 94		
Faculty/Chair/Department	FB09/Agronomy/Institute for Crop Farming and Cultivation 1, Business Management/Institute for Farm and Agribusiness Management		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Prerequisites: basic knowledge of economics/business administration and crop production The modules BP 98 and BP 103 are recommended		
Learning outcomes	The students • are able to understand the characteristics and effects of production systems for bioenergy on cultivation, economy and ecology; • see and understand the economic and ecological connections within and between the production systems; • are able to apply scientific methods for analysing the sustainability of production systems; • are able to evaluate these production systems on a macro and microeconomic level based on multiple criteria.		
Module content	• energy requirement and energy supply – now and in the future • regulatory and fiscal framework conditions • consideration of bioenergy provision from the point of view of business administration, plant breeding and ecology • technologies used in the production of bioenergy (biogas, vegetable methyl ester, biomass to liquid (BTL), heat energy) • criteria for evaluating bioenergy provision • practical demonstration and analysis of biogas-producing enterprises		
Form(s) of instruction	Lecture (50%), seminar (40%), excursion (10%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30, seminar: 20, excursion: 10		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination, seminar work and presentation Mark: written examination (50%), seminar work and presentation (50%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Intake capacity	50		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/honermeier
Required literature: see Stud.IP and department website

09-MP 95	**Current Developments in Nutritional Science**	**2nd sem.**	**6 CP**
Module	Current Developments in Nutritional Science		
Module code	MP 95		
Faculty/Chair/Department	FB09/Nutritional Biochemistry/Institute for Nutritional Science		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Chemistry, Biochemistry, Specialised Biochemistry I (MKE 01)		
Learning outcomes	The students • have an overview over the latest scientific developments in the field of human nutritional science; • have an overview over the latest methodological approaches in the field of human nutritional science; • have proficiency to identify, present and discuss recent scientific literature; • are able to put scientific questions, the choice of experimental methods, results and significance of scientific results into the context of current literature and to critically analyse and discuss them; • are prepared for independent scientific work/undertaking of a doctorate in the field of molecular nutritional research.		
Module content	• novel methods and experimental methods in nutritional science • recent developments in the fields of o nutrigenomics o intestinal transport mechanisms o function and mechanisms of enzymes, vitamins and cofactors o nutrition and ageing/degeneration o nutrition and disease prevention • metabolic disease and nutrition		
Form(s) of instruction	Seminar (70%), tutorials (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	130		
Aa Contact hours	60 consisting of: seminar: 40, exercises: 20		
Ab Preparation/revision	70 consisting of: preparation: 30, revision: 40		
B Autonomous work	20: work in small groups		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: written examination Mark: written examination (100%) - Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended standing	2nd semester		
Intake capacity	Unlimited		
Language of instruction	Mainly English		

Homepage: http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/becker

Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 96	**Perception and Explanation of the Social Environment**	**3rd sem.**	**6 CP**
Module	Perception and Explanation of the Social Environment		
Module code	MP 96		
Faculty/Chair/Department	FB09/Agricultural Sociology/Institute for Agricultural Sociology and Extension		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	The students • are acquainted with sociological issues concerning behaviour towards the environment; • can apply qualitative methods of empirical social research; • can reflect upon theories and methods and design suitable usage scenarios; • have gained experience connecting theory and empiricism.		
Module content	Theories: • guideline-based interviews, in-depth interviews, narrative interviews, • structure-formation technique • hermeneutical analysis methods • system and environment theories • risk theories • psychological theories of behaviour towards the environment		
Form(s) of instruction	Lecture (40%), seminar (30%), project (30%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	150		
Aa Contact hours	40 consisting of: lecture: 20, seminar: 20		
Ab Preparation/revision	90 consisting of: lecture: 20, seminar: 30, project: 40		
B Autonomous work	20: project		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination, project presentation, project report Mark: oral examination (40%), project presentation (30%), project report (30%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	20		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/fbr09/kub/
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 97	**Microbial Diagnostics**	**3rd sem.**	**6 CP**
Module	Microbial Diagnostics		
Module code	MP 97		
Faculty/Chair/Department	FB09/Microbiology of Recycling Processes/Institute for Applied Microbiology		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None		
Learning outcomes	Students • gain in-depth knowledge of the fundamentals of microbial diagnostics; • gain knowledge of quality standards and inspection measures in the fields of environmental technologies and food microbiology; • learn methods of quantification and qualification of bacteria with cultivation-dependent and cultivation-independent methods.		
Module content	• hygiene, controlling of transmissible diseases, disinfection, sterilisation, bacteriological quality control of food, drinking water, bathing water, waste water and air (legal foundations and standards) • microbiological diagnostics (conventional and molecular-biological methods in the context of quality assurance measures), microbial contamination of food and the environment (legal foundations and standards) • quantification and qualification of biotechnologically important microorganisms; accumulation of physiological specialised microorganisms (nitrifier, denitrifier), identification of bacteria with conventional and molecular-biological methods; enzyme detection, bacteriological analyses in the context of microbiological quality control		
Form(s) of instruction	Lecture (50%), seminar (50%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lectures: 30, seminar: 30		
Ab Preparation/revision	60		
B Autonomous work	30		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: oral examination (30 mins) Mark: oral examination (100%) - Oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Intake capacity	30		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/fbr09/mikrobiologie/inst_home.html
Required literature: see Stud.IP and department website

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09-MP 98	**Molecular Plant Breeding**	**1st sem.**	**6 CP**
Module	Molecular Plant Breeding		
Module code	MP 98		
Faculty/Chair/Department	FB09/Crop Farming/Institute for Crop Farming and Breeding I		
Associated degree course(s)/Semester taken	All master's study programmes in FB09/1st semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Theoretical knowledge of molecular genetics		
Learning outcomes	The students • gain hands-on laboratory experience DNA and RNA extraction and analysis techniques, PCR, molecular marker analysis, gene expression and gene transfer by agrobacterium transformation; • learn practical applications of biotechnological and molecular genetic methods in plant breeding; • obtain the necessary practical background to apply experimental molecular genetics, biotechnological and gene technological methods in plant breeding.		
Module content	• DNA extraction and quantification • polymerase chain reaction (PCR) • agarose and polyacrylamide gel electrophoresis • molecular marker analysis, genome mapping and QTL analysis • DNA filter and chip hybridisation methods • RNA isolation and cDNA analysis • quantitative real-time PCR • methods of gene technology in plant breeding: gene transfer (transformation techniques) and detection methods		
Form(s) of instruction	Lab practical (100%)		
Total workload in hours	180	Credit points: 6 ECTS credits	
Module composition: A Courses in total	120		
Aa Contact hours	70 (weekly lab practical)		
Ab Preparation/revision	50		
B Autonomous work	30 (experimental planning)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: lab protocols, oral examination Mark: lab protocols (50%), examination (50%) - Lab protocols, oral examination		
Frequency, duration in semesters	Winter semester, annually 1 semester		
Recommended standing	1st semester		
Intake capacity	10		
Language of instruction	English		

Homepage: http://www.plantbreeding-giessen.de
Required literature: see Stud.IP and department website

Please note that only the German version of the modules is official and legally binding. The English version is for informative purposes only.

09-MP 99	**Sustainability in Everyday Personal Service Position**	**1st/3rd sem.**	**6 CP**
Module	Sustainability in Everyday Personal Service Position		
Module code	MP 99		
Faculty/Chair/Department	FB09/Economics of the Private Household and Family Studies/Institute for Household Economics and Consumer Research		
Associated degree course(s)/Semester	All master's study programmes in FB09, lectureship (e.g. apprenticeship), sociology/1st or 3rd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Family and Society (BKÖ 44)		
Learning outcomes	The students • can estimate the role of private households and private consumption in the context of sustainability problems; • see the milieu-specific scopes of action and the context for sustainable everyday supply from the perspective of private households and on the basis of lifestyle typologies; • are able to elaborate a research topic comprehensively in a project group, analyse it methodically and present it.		
Module content	• main issues in the theme of sustainability and relevance of different areas of consumption in the household (food, clothes, mobility) • determinants of economic actions • epistemological priorities in transdisciplinary and interdisciplinary working methods • practical application of methods of empirical social research when elaborating a research topic independently in a small group		
Form(s) of instruction	Block lecture with group work and project work (100%)		
Total workload in hours	180	Credit points: 6 ECTS points	
Module composition: A Courses in total			
Aa Contact hours	20 (block lecture)		
Ab Preparation/revision	-		
B Autonomous work	130		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: project work with written report and oral presentation Mark: project work with written report (60%) and oral examination (40%) Relevant part of the examination Relevant part of the examination		
Frequency, duration in semesters	Winter semester Block lecture		
Intake capacity	25		
Language of instruction	German		

Homepage: http://www.uni-giessen.de/wps/fbr09/home/meier/

Required literature: see Stud.IP and department website

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09-MP 100	**Applied Statistics and Environmental Informatics**	**2nd sem.**	**6 CP**
Module	Applied Statistics and Environmental Informatics		
Module code	MP 100		
Faculty/Chair/Department	FB09/Biometry and Population Genetics/Institute for Agronomy and Plant Breeding II		
Associated degree course(s)/Semester taken	Master's Agrobiotechnology/2nd semester		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	Basics in biostatistics and bioinformatics		
Learning outcomes	The students • have in-depth knowledge about quantitative methods in agronomy; • have in-depth knowledge in agronomy experiments; • can design experiments statistically; • have in-depth knowledge in hypothesis testing and inferential statistics.		
Module content	• cluster analysis • aariogram analysis and Kriging • covariance analysis • multiple regression • multi-attribute analysis		
Form(s) of instruction	Lecture (50%), practical work on computers (50%)		
Total workload in hours	180	Credit points: 6 ECTS points	
Module composition: A Courses in total	120		
Aa Contact hours	60 consisting of: lecture: 30,exercises: 30		
Ab Preparation/revision	60		
B Autonomous work	30 (exercise work)		
C Final module examination	30		
Method(s) of assessment and contribution to final mark Form of module-component retake examination Form of retake examination	Form: weekly exercises, written examination Mark: exercises (30%), written examination (70%) Written examination Written examination		
Frequency, duration in semesters	Summer semester, annually 1 semester		
Recommended standing	1st semester		
Intake capacity	20 (exercises in parallel groups)		
Language of instruction	English		

Homepage: http://www.uni-giessen.de/fbr09/biometrie/
Required literature: see Stud.IP and department website

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B-List

MP B 01 Gender Aspects in Development Cooperation
MP B 02 Legislation for Social Welfare Services and Institutions
MP B 03 Gender and Nutrition
MP B 04 Medical, Food & Health Studies

MP B 06 Consumer Policy
MP B 08 Landscape Analysis with GIS
MP B 09 Probiotic Foodstuffs
MP B 10 Legal and Scientific Decision Processes for Health Claims
MP B 11 Day Care for Children in Germany

MP B 01	**Gender Aspects of Cooperation for Development**				**1st/3rd sem.**	**6 CP**
Module	Gender Aspects of Cooperation Development					
Module code	BP B 05					
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Sciences/Nutrition in Developing Countries					
Associated degree course(s)/Semester taken	Specialisation, Mater (1st/3rd)					
Module coordinator	Cf. German version					
Instructors	Cf. German version					
Prerequisites	none					
Learning outcomes	The students • gain an in-depth insight into the living situation of women in developing countries • can give informed opinions on the particular problems of different continents • improve their ability to assess available studies on gender aspects					
Module content	• participatory gender-related planning tools • gender mainstreaming • suitable planning and analysis tools for illiterates • analysis of studies, presentation and discussion (currently relevant countries and topics will be chosen) • comparative analysis of studies • current research studies					
Form(s) of instruction	Seminar (100%)					
Total workload in hours	180					
Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	60	58			118
	Laboratory/ Tutorial					
	Excursion	60	58	60	2	**180/6 ECTS credits**
	Homework					
	Total workload					
Final module examination	Form(s) of assessment	Oral examination, presentation, attendance and willingness to engage in discussions				
	Contribution to final mark	Oral examination (50%), presentation, attendance and willingness to engage in discussions (50%)				
	Form of module component retake examination	-				
	Form of module retake examination	Oral examination				
Frequency	Winter semester			Duration: 1 semester		
Intake capacity	40					
Language	German					
Homepage	http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaerhrungswissenschaft/ag/krawinkel					

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MP B 02	**Legal Aspects of Social Services**	**2nd/4th sem.**	**6 CP**
Module	Legal Aspects of Social Services		
Module code	BP B 05		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Science/Health and Social Politics		
Associated degree course(s)/Semester taken	Specialisation, Master (2nd/4th)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	MK 35 HD		
Learning outcomes	The students • are familiar with the fundamental considerations with regard to social welfare law, • are familiar with the development of the legal fundamentals in the areas listed below, • are acquainted with current development, current focus and controversies of the development of social welfare law, • have the ability to solve legal problems related to governing and managing of social services and institutions autonomously.		
Module content	• Legal fundamentals of social welfare services and institutions in the area of children and youth care • legal fundamentals of social welfare services and institutions in the area of old-age care (in-patient and out-patient) • legal fundamentals of public health and preventative care as well as services for health promotion		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	60	60			120
	Laboratory/ Tutorial					
	Excursion	60	60	58	2	**180/6 ECTS credits**
	Homework					
	Total workload					

Final module examination		
	Form(s) of assessment	Presentation and written assignment
	Contribution to final mark	Presentation (50%), written assignment (50%)
	Form of module component retake examination	-
	Form of module retake examination	Written assignment (revision)

Frequency	Summer semester	Duration: 1 semester
Intake capacity	unlimited	
Language	German	
Homepage	http://wi.uni-giessen.de/wps/f09/home/evers/	

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MP B 03	**Gender and Nutrition**	**2nd/4th sem.**	**6 CP**
Module	Gender and Nutrition		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Household Economics and Consumer Research/Household and Family Economics		
Associated degree course(s)/Semester taken	Specialisation, Master (2nd/4th)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	none		
Learning outcomes	The students • are familiar with gender-specific nutrition behaviour as a cultural characteristic, • are aware of nutrition as a socio-cultural phenomenon and gender as a social construction, • understand the relevance of eating and nutrition practices for the construction of gender relations.		
Module content	• social effects of gender differentiation through nutritional preferences, eating styles, food distribution, demonstration of assistance and care • empirical findings related to gender differentiated eating habits • household, family and semantics of the “housewife” • nutrition standards, gender differentiated body and nutrition socialisation • eating disorders and abnormal eating behaviour		
Form(s) of instruction	Seminar (62%), laboratory/tutorial (38%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	25	80			105
	Laboratory/ Tutorial	15				
	Excursion					
	Homework					
	Total workload	40	80	58	2	**180/6 ECTS credits**

Final module examination		
	Form(s) of assessment	Presentation with written report or written assignment
	Contribution to final mark	Presentation (50%), with written report or written assignment (50%)
	Form of module component retake examination	-
	Form of module retake examination	Written assignment (revision)

Frequency	Summer semester, block course	Duration: 1 semester
Intake capacity	30	
Language	German	
Homepage	http://www.uni-giessen.de/wps/f09/home/meier/	

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MP B 04	**Study Methods in Nutritional Medicine**	**4th sem.**	**6 CP**
Module	Study Methods in Nutritional Medicine		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Sciences/Nutrition in Developing Countries		
Associated degree course(s)/Semester taken	Specialisation, Master (4th)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	none		
Learning outcomes	The students • can gauge, which scientific issues are investigated with which study type, • have in-depth knowledge of the planning, undertaking and analysing process in medical, food & health studies, • can assess organisational boundary conditions and the required time and effort for such studies, • have in-depth knowledge of the guidelines and the use of validated survey instruments for the assessment of nutrition and lifestyle, • can estimate the scientific relevance of study results.		
Module content	• phrasing of scientific issues and questions, literature review • cooperation partners and raising of funds • determination of study type • estimation of sample sizes, inclusion and exclusion criteria • methods of clinical and anthropometric investigations • survey instruments for the fields of nutrition, lifestyle and medication • data management and bio-mathematics • personnel, logistics, spatial resources • subject information, consent, ethics committee • compilation of addresses, data management • pilot phase and process evaluation • information and marketing work • data input and data checking • analysis and results • writing of scientific publications		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	60	58			118
	Laboratory/ Tutorial					
	Excursion					
	Homework					
	Total workload	60	58	60	2	**180/6 ECTS credits**

Final module examination		
	Form(s) of assessment	Written examination and seminar contribution
	Contribution to final mark	Written examination (67%), seminar contribution (33%)
	Form of module component retake examination	-
	Form of module retake examination	Written or oral examination

Frequency	Summer semester, block course	Duration: 1 semester
Intake capacity	40	
Language	German	
Homepage	http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/krawinkel	

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MP B 06	**Consume Patterns and Consumer Policy in Health, Social Services and Nutrition**	**4th sem.**	**6 CP**
Module	Consume Patterns and Consumer Policy in Health, Social Services and Nutrition		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Household Economics and Consumer Research/Comparative Health and Social Policy		
Associated degree course(s)/Semester taken	Specialisation, Master (3rd)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	None (MK 35 HD recommended)		
Learning outcomes	The students • are familiar with the most important theoretical approaches for understanding consumer patterns, personal service relationships and the legislative framework in each of these areas, • have knowledge of the basic forms of instutionalisation of consumer policy concepts, funds and methods in health and social areas as well as the nutritional components within these, • have the ability to autonomously identify problems and develop concepts as well to work within groups.		
Module content	• different theoretical approaches to consumer patterns, service relationships and the role of political frameworks (exit & voice, informed consent, consumer-citizen) • basic forms and instruments of institutionalisation of security, counselling and funding in health and social areas as well as the nutritional components within these (rights and resolutions, voucher, case-management, counselling centres) • case studies in key areas and cross-sector themes (health promotion, care counselling, parent cooperation and voting rights in schools and kindergartens, network supported information and counselling, customer surveys, management of customer complaints, patient and consumer advocacy groups)		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	60	60			120
	Laboratory/ Tutorial					
	Excursion					
	Homework					
	Total workload	60	60	40	20	**180/6 ECTS credits**

Final module examination		
	Form(s) of assessment	Presentation, written assignment
	Contribution to final mark	Presentation (50%), written assignment (50%)
	Form of module component retake examination	-
	Form of module retake examination	-

Frequency	Summer semester	Duration: 1 semester
Intake capacity	unlimited	
Language	German	
Homepage	http://www.uni-giessen.de/wps/fb09/home/evers/	

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MP B 08	**Landscape Analysis with GIS**	**4th sem.**	**6 CP**
Module	Landscape Analysis with GIS		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Sciences/Nutrition in Developing Countries		
Associated degree course(s)/Semester taken	Specialisation, Master (2nd)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	MK 55 UR (or other previous course in statistics), knowledge of GIS		
Learning outcomes	The students • can undertake landscape analyses based on GIS, • have knowledge of soil hydrologic measurement methods, • can transfer point measurements onto a surface, • learn to present results in a scientific manner.		
Module content	• experimental design in landscape analysis • GIS analysis of digital elevation models • field measurement of soil hydrologic parameters • analysis of field measurements with R • CART analysis with R, spatial prediction • GIS map creation • data analysis and presentation of results in the form of a report		
Form(s) of instruction	Lecture (29%), laboratory/tutorial (71%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture	20	30			50
	Seminar					
	Laboratory/ Tutorial	50				
	Excursion					
	Homework					
	Total workload	70	30	60	20	**180/6 ECTS credits**

Final module examination		
	Form(s) of assessment	Presentation of literature, tutorial exercise
	Contribution to final mark	Presentation of literature (25%), tutorial exercise (75%)
	Form of module component retake examination	-
	Form of module retake examination	Revision of tutorial exercise

Frequency	Summer semester, block course	Duration: 1 semester
Intake capacity	20	
Language	German	
Homepage	http://www.uni-giessen.de/cms/fbz/fb09/institute/ilr/ilr-frede/view?set_language=de	

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MP B 09	**Probiotic Foods**				**4th sem.**	**6 CP**
Module	Probiotic Foods					
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Sciences/Nutrition in Developing Countries					
Associated degree course(s)/Semester taken	Specialisation, Master (1st)					
Module coordinator	Cf. German version					
Instructors	Cf. German version					
Prerequisites	none					
Learning outcomes	The students • have knowledge of probiotic microorganisms • have knowledge of the production of probiotic foodstuffs • gain an insight into the quality control of probiotics • gain an insight into the marketing of probiotic foodstuffs					
Module content	• diversity and distribution of microorganisms • historical and cultural classification of probiotics • metabolism physiology of probiotic bacteria • detection principles of microbiological methods • quality assurance of foodstuffs • demonstration of a number of microbiological techniques and different microorganisms • marketing and legislation of foodstuffs • insight into the procedures in the foodstuff industry					
Form(s) of instruction	Lecture (50%), seminar (30%), excursion (20%)					
Total workload in hours	180					
Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture	30	60			90
	Seminar	18				
	Laboratory/ Tutorial					
	Excursion	12				
	Homework					
	Total workload	60	60	30	30	**180/6 ECTS credits**
Final module examination	Form(s) of assessment	Written examination				
	Contribution to final mark	Written examination (100%)				
	Form of module component retake examination	-				
	Form of module retake examination	Written examination				
Frequency		Winter semester		Duration: 1 semester		
Intake capacity		unlimited				
Language		German				
Homepage		http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaften/ag/kunz				

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MP B 10	**European Food Law and Scientific Requirements related to Health Claims**	**X sem.**	**6 CP**
Module	European Food Law and Scientific Requirements related to Health Claims		
Faculty/Chair/ Department	Agricultural Sciences, Nutritional Sciences and Environmental Management/Institute for Nutritional Sciences/Nutrition in Developing Countries		
Associated degree course(s)/Semester taken	Specialisation, Master (Xnd)		
Module coordinator	Cf. German version		
Instructors	Cf. German version		
Prerequisites	none		
Learning outcomes	The students • are familiar with the legislative fundamentals for health-related data on a European level • are acquainted with the structure of involved European institutions • understand how decisions related to foodstuffs are made on a European level • evaluation of simulated proposals according to VO EG 1924/2006 • learn to assess scientific studies • have the ability to write funding proposals • can research and work on scientific issues autonomously		
Module content	• structure and functions of European institutions • legal policies for health-related data on a European level • autonomous preparation of proposals according to VO EG 1024/2006 • creation and evaluation of simulated proposals • assessment of scientific studies • advantages and disadvantages of health-related data for proposers and users		
Form(s) of instruction	Seminar (100%)		
Total workload in hours	180		

Total workload in hours		A Courses		B Autonomous Work in the module	C Module examination	
		a contact hours	b preparation/ revision			Total
	Lecture					
	Seminar	60	60			120
	Laboratory/ Tutorial	50				
	Excursion					
	Homework					
	Total workload	60	60	60		**180/6 ECTS credits**

Final module examination		
	Form(s) of assessment	Written report of seminar work, presentations
	Contribution to final mark	Presentations (50%), written report (50%)
	Form of module component retake examination	-
	Form of module retake examination	Written or oral examination

Frequency	Summer semester	Duration: 1 semester
Intake capacity	15	
Language	German	
Homepage	http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaften/neuhaeuser-berthold	

MP B 11	**Day Care for Children in Germany**	**6 CP**
Module	Day Care for Children in Germany: Conflict between Availability and Demand	
Module code	MP B 11	
Faculty/Chair/ Department	All FB09 master's degree courses/1st to 4th semester	
Associated degree course(s)/Semester taken	Cf. German version	
Module coordinator	Cf. German version	
Instructors	none	
Prerequisites	All FB09 master's degree courses/1st to 4th semester	
Learning outcomes	The students • can judge the possibilities and conflicts in the field of child day care, • can make informed statements regarding the problems and requirements of different family types, • have the ability to evaluate aspects and problems of child care in the context of migration, integration, gender, quality assurance, issues regarding qualifications, marketing and customer orientation etc.	
Module content	• structure of the child day care system in Germany • international concepts for child day care • family types and their different needs • future perspective of child day care • child day care as an occupational field • project work: preparation of a poster exhibition on the topic of child day care focussing on migration, integration, gender, quality assurance, issues regarding qualifications, marketing and customer orientation etc.	
Form(s) of instruction	Block course with group work and project	
Total workload in hours	180	Credit points: 6 ECTS credits
Module composition: A Courses		
Aa Contact hours	25	
Ab Preparation/revision		
B Autonomous work in the module	125	
C Final module examination	30	
Form(s) of assessment and contribution to final mark Form of module component retake examination Form of module retake examination	Form: project work with preparation of poster, presentation of poster and written report Mark: project work with preparation of poster (50%), presentation of poster (20%) and written report (30%) Respective part of examination Respective part of examination	
Frequency, duration	Summer semester, block course	
Intake capacity	25	
Language	German	

MK XX – Progress in Plant Nutrition					**1.-4. Semester**	**6 CP**
Module description	Progress in Plant Nutrtion					
Faculty / chair / department	Agricultural Sciences, Nutritional Sciences and Environmental Management Plant Nutrition / Institute of Plant Nutrition					
Applies to degree courses/semesters	Plant Production, Master (1-4)					
Module coordinator	Cf. German version					
Instructors	Cf. German version					
Prerequisites for participation	Nutritional Physiology of Agricultural Crops (MKP 58) or Plant Nutrition (BKA 24)					
Course aims	Students will • have a profound knowledge in plant nutrition • be acquainted with modern methodologies of plant nutrition • be able to present and discuss new research results at an international level					
Module content	• plant cultivation in soil and nutrient solution • quantification and evaluation of physiological parameters • biochemical analyses • presentation and discussion of research results					
Forms of instruction	Seminar (33%), Practical training (67%)					
Total workload in hours	180 hours					
	Consisting of: A courses in total		B autonomous work in the module	C module examination		
	a contact hours	b preparation/follow-up work			Total	
Lecture						
Seminar	20					
Practical training/exercise	40					
Study trip						
Homework		70				
	60	116	2	2	**180 / 6 CP**	
Module examination	Form(s) of assessment	oral examination				
	Components of final grade	oral examination (100 %)				
	Form of module component retake examination					
	Form of module retake examination	oral examination				
Frequency	SoSe and WiSe					
Intake capacity	10					
Language of instruction	English and German					
Website	http://www.uni-giessen.de/plant-nutrition/english.htm					