JUSTUS-LIEBIG-UNIVERSITÄT GIESSEN

FB09

19.7.2016

Course Directory

Faculty 09 - Agricultural Sciences, Nutritional Sciences and Environmental Management

English Master Degree Course Modules

Please consult the timetable or current university calendar for information regarding dates and room numbers of the modules taught in the course:

http://www.uni-giessen.de/cms/fbz/fb09/studium/msc/stpl

MK 67 - Economic Development and World Agricultural Markets	**2. Sem.;**	**6 CP**

English Module Title	Economic Development and World Agricultural Markets
Faculty / chair / department	Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Entwicklungspolitik
Applies to degree courses/semesters	Transition Management, Master (2.)Weinwirtschaft, Master (2.)Agrar- und Ressourcenökonomie, Master (2.)
Module coordinator	Prof. Dr. P. Michael Schmitz
Instructors	Prof. Dr. Schmitz, Prof. Dr. Herrmann and group members
Prerequisites for participation	none
Course aims	Students will • be able to analyze and systematize the problem of development in its various dimensions and to establish connections to poverty, hunger and malnutrition • be able to provide explanatory approaches to the existence of underdevelopment, poverty and food insecurity • be able to assess agricultural and developmental policy measures and problem-solving strategies • be able to understand the characteristics of world agricultural markets as well as price formation on and interdependencies between such markets • be 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 industrialized countries and development • sustainable development • growth, transformation and development • globalization from the perspective of the developing world • features of world agricultural markets (price instability, terms of trade) • influence of national agricultural policies, agricultural development policy and international commodity agreements on world agricultural trade • activities of internat. organizations, their influence on world agricultural trade • supply, demand and pricing in major world agricultural markets
Forms of instruction	Vorlesung (80%), Seminar (20%)

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	48	30			
	Seminar	12	15			
	Practical training					
	exercises					
	Study trip					
	Homework					
		60	45	45	30	**180 / 6 CP**

Module examination		
	Form(s) of assessment	a) written examination (2 h) or b) other examinations conducted by the teaching staff (see SpezO § 8).
	Components of final grade	written examination (100 %)
	Form of module component retake examination	
	Form of module retake examination	written examination (2 h) or repeat/revision of the examination as described in b).

Frequency	SoSe	Duration 1 Semester	
Intake capacity	not limited		
Language of instruction	English		
Website	http://www.uni-giessen.de/cms/fbz/fb09/institute/iam/prof-ae		

MK 68 - Empirical Research Methods						**1. Sem.;**	**6 CP**
English Module Title		Empirical Research Methods					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Entwicklungspolitik					
Applies to degree courses/semesters		Transition Management, Master (1.)					
Module coordinator		Prof. Dr. P. Michael Schmitz					
Instructors		Prof. Dr. Nuppenau, Prof. Dr. Herrmann, Prof. Dr. Schmitz, Prof. Dr. Leonhäuser, PD Dr. Helmle, Prof. Dr. Kühl, Prof. Dr. Winker					
Prerequisites for participation		none					
Course aims		The students • have acquired knowledge of general principles of various qualitative and quantitative research methods as well as evaluation research • are able to understand the application of various methods with regard to research objectives					
Module content		• Advanced mathematical economics • Mathematical production economics (e.g. cost function) • Correlation and causality • Basic approach of econometrics • Basic introduction to simple and multiple regression analysis • Principles and extensions of cost-benefit analysis • Principles of applied statistics and grounded theory • Collecting and analysing panel data • Designing of surveys, interviews, questionnaires • Qualitative data collection technique • Principles of strategic management • Game theory • Organisation theory					
Forms of instruction		Vorlesung (50%), Seminar (50%)					
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	30	30				
	Seminar	30	30				
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	60	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Written exams (2 h) or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Written exams (100 %)					
	Form of module component retake examination						
	Form of module retake examination	Written exams or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		not limited					
Language of instruction		English					

MK 69 - World Food Economy					**2. Sem.;**	**6 CP**
English Module Title	World Food Economy					
Faculty / chair / department	Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Entwicklungspolitik					
Applies to degree courses/semesters	Transition Management, Master (2.)					
Module coordinator	Prof. Dr. P. Michael Schmitz					
Instructors	Prof. Dr. P. Michael Schmitz					
Prerequisites for participation	None					
Course aims	Students can • learn theories, models and policy instruments of international trade as well as advanced market analysis • explain the real and monetary foreign economic relations in the agriculture and food sector and its development • assess the impact of foreign trade operations and argue about the controversies and trade-offs in agricultural, environmental and trade policies • take position on the integration of developed, developing and transition countries into the world economy and on the location economic policy for food and job security					
Module content	• Theories of international trade with agricultural and food industry products • Demand side: factors affecting food consumption patterns • Supply side: Agricultural production and its determinants • Trade policies - impact analysis and economic evaluation of welfare • Specific factors and income distribution • Resources and Trade: Heckscher-Ohlin Model • External Economies of scale and the international Location of Production • Political Economy of Agricultural Trade Policy • Money, Interest Rates, Exchange rates and foreign exchange markets • International monetary systems and Optimum Currency Areas • Development of world food markets and strategies for food security • Regional Trends of Global food Economy • Bilateral and multilateral development policies • Globalization and its implications from the perspective of developing and transition countries • Resource utilization, agricultural and Environmental trade-offs, Organic farming • New technologies for food security					
Forms of instruction	Vorlesung (50%), Seminar (50%)					
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	30	30				
Seminar	30					
Practical training						
exercises						
Study trip						
Homework						
	60	30	60	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Written test, seminar work or b) other examinations conducted by the teaching staff (see SpezO § 8).				
	Components of final grade	Written test (50%), seminar work (50%)				
	Form of module component retake examination					
	Form of module retake examination	Written test and Grade of seminar work or repeat/revision of the examination as described in b).				
Frequency	SoSe	Duration 1 Semester				
Intake capacity	40					
Language of instruction	English					

MK 70 - Economics, Organization and Management in Agriculture and Food Industries						**2. Sem.;**	**6 CP**
English Module Title		Economics, Organization and Management in Agriculture and Food Industries					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Betriebslehre der Agrar- und Ernährungswirtschaft / Landwirtschaftliche Produktionsökonomik					
Applies to degree courses/semesters		Transition Management, Master (2.)					
Module coordinator		Prof. Dr. Joachim Aurbacher					
Instructors		Prof. Dr. Aurbacher, Prof. Dr. Kühl					
Prerequisites for participation		None					
Course aims		Students will • be able to understand and evaluate management processes in the agricultural and food industry • be able to work conceptually on business strategic and organisational problems, such as human resource management, compensation and motivation, investment, capital structure, and corporate control • be able to execute extended economic methods and management techniques • be able to execute advanced optimisation modelling techniques • be able to use spreadsheets and database applications to represent and solve business, financial and incentives decision problems • get insight into modelling of human motivation, business behaviour, and the means of coordination performed by agricultural and food industry					
Module content		The division of labour and the resulting need for the coordination of distributed actors towards a predefined goal lies at the root of organizational and management theory. Firm`s efficient organizational design is one of the key tasks and challenges for management practice. However, especially over the last decades, the corresponding design and coordination of physical goods and financial flows in (often global) supply chains within and across companies has emerged as a related and strategically highly intertwined challenge. Core problems, concepts and techniques for the analysis, design and management of organizations and their inter-organizational supply chains are introduced. General principles of organizational and supply chain design are provided and current trends and emerging management challenges are assessed. Advanced modelling techniques for optimisation under constraint resources are introduced. Case studies and company presentations serve to illustrate the theoretical concepts and to further students` understanding. The evolution of business and economic systems and its restructuring are part of the course.					
Forms of instruction		Vorlesung (60%), Seminar (40%)					
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	36	60				
	Seminar	24	30				
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	90		30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Written examination or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Written examination (100%)					
	Form of module component retake examination						
	Form of module retake examination	Written examination or repeat/revision of the examination as described in b).					
Frequency		SoSe		Duration 1 Semester			
Intake capacity		50					
Language of instruction		English					

MP 020 - Plant Breeding: Special Topics of Resistance and Quality Breeding						**2. Sem.;**	**6 CP**
English Module Title		Plant Breeding: Special Topics of Resistance and Quality Breeding					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Pflanzenbau und Pflanzenzüchtung I / Pflanzenzüchtung					
Applies to degree courses/semesters		Profil, Master (2.)					
Module coordinator		Prof. Dr. Rod Snowdon					
Instructors		Prof. Dr. Snowdon and assistants					
Prerequisites for participation		none					
Course aims		The students • will obtain profound knowledge about the breeding goals regarding disease resistances and quality aspects of important European crops • will obtain profound knowledge about essential methods to record the respective resistance and quality attributes • will obtain knowledge about how to realize breeding goals in the breeding process depending on the genetics and inheritance of the respective trait • will obtain 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 major European crops • detection methods for resistance reactions in selected crops • detection methods for important quality parameters of selected crops • natural diversity and genetics of quality parameters (cereals, oil and protein plants) • methods to identify and increase genetic variation for important traits • methods of cell and tissue culture and their use in breeding for resistance and quality					
Forms of instruction		Vorlesung (50%), Exkursion (50%)					
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	30	30				
	Seminar						
	Practical training						
	exercises						
	Study trip	30	30				
	Homework						
		60	60	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Oral examination, seminar work, protocols or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	oral examination (70 %), seminar (15 %) and protocols (15 %)					
	Form of module component retake examination						
	Form of module retake examination	oral examination or repeat/revision of the examination as described in b).					
Frequency		SoSe		Duration 1 Semester			
Intake capacity		not limited					
Language of instruction		English					
Website		http://www.uni-giessen.de/cms/fbz/fb09/institute/plantbreeding/ipz/					

MP 029 - Plant-Microbe Interactions						**2./4. Sem.;**	**6 CP**
English Module Title		Plant-Microbe Interactions					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Phytopathologie / Phytopathologie					
Applies to degree courses/semesters		Profil, Master (2./4.)					
Module coordinator		Prof. Dr. Karl-Heinz Kogel					
Instructors		Prof. Dr. Kogel, Prof. Dr. Schnell, Dr. Schikora, Dr. Cardinale					
Prerequisites for participation		basics in microbiology and phytopathology					
Course aims		Students will • be familiar with interactions of parasitic and symbiotic biocenoses • be able to discuss the application of alternative measures for reduction of pesticide and chemical fertilizers • be familiar with concepts of modern interdisciplinary approaches to the use of microorganisms in disease control					
Module content		• physical and chemical conditions in the rhizosphere (pH, O2, exudate gradients) • root pathogens (fungi, bacteria) • pest control strategies on roots • growth promotion of rhizospheric microorganisms (N2 fixation, regulation of the nif gene, plant-promoting factors, mycorrhiza) • resistance mechanisms • possibilities and limitations of inoculation with VAM or N2-fixing bacteria • interaction with beneficial microorganisms (PGPR, BCAs) • microbial interactions with lower plants (mosses, lichens, etc.) • methods for the study of uncultivable microorganisms on/in plant tissues					
Forms of instruction		Vorlesung (75%), Seminar (25%)					
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	45	40				
	Seminar	15	30				
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	70	20	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) written examination, seminar paper (each part must be sufficient) or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	written examination (70 %), seminar paper (30 %)					
	Form of module component retake examination	repeat/revision of the failed examination part					
	Form of module retake examination	oral or written examination or repeat/revision of the examination as described in b).					
Frequency		SoSe		Duration 1 Semester			
Intake capacity		60					
Language of instruction		English					
Website		www.uni-giessen.de/ipaz					

MP 044 - Economy of Rural Institutions						**3./4. Sem.;**	**6 CP**
English Module Title		Economy of Rural Institutions					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Umweltpolitik					
Applies to degree courses/semesters		Profil, Master (3./4.)Profil Transition Management, Master (3./4.)					
Module coordinator		Prof. Dr. Ernst-August Nuppenau					
Instructors		Prof. Dr. Nuppenau					
Prerequisites for participation		none					
Course aims		Students will • have basic knowledge of the relationship between agriculture and society from perspectives of sociology and institutional economics • be able to recognize how human activity is determined in a social context, as well as how institutions are explained economically and socially • recognize the interactions between individuals and society and know methodical approaches to elucidating the structure of agrarian societies • be familiar with basic social issues in agrarian societies and be able to apply various social theories of work, land, credit, input markets					
Module content		• Foundations of & demands on agrarian institutions by transaction minimal costs • Efficient institutions and rural forms of organization • Work and land: theories of sharecropping and distribution of surplus • Land taxes: potentials and limitations in international comparison • Land policy and land reform, institutional regulation of rural credit markets • Water rights and technology • Comparison of agricultural law in various countries • Problems associated with institutional change • Institutional problems of agricultural transition in Eastern Europe • Interaction between individuals and societal institutions, • Theories of social stratification, community and society • Theories of social change and effects on the agricultural sector • Property and usage rights, property rights and rents • Theories of social justice and appropriation • Agrarian constitutions and labour regulations • Land access and regulations, land ownership • Rural behaviour, rural welfare systems in historical context • Traditional social safety nets • Peasantry and peasant behaviour, farming as a lifestyle					
Forms of instruction		Vorlesung (50%), Seminar (50%)					
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	30	30				
	Seminar	30	30				
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	60	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Oral examination (0,5 h) and presentation or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Oral examination (60%), presentation (40%)					
	Form of module component retake examination						
	Form of module retake examination	Oral examination or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		not limited					
Language of instruction		English					
Website		http://www.uni-giessen.de/cms/fbz/fb09/institute/iam/pau					

MP 075 - Host-Intestine-Microbe Interactions for Nutrition and Health	**2./4. Sem.;**	**6 CP**

English Module Title	Host-Intestine-Microbe Interactions for Nutrition and Health
Faculty / chair / department	Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Angewandte Mikrobiologie / Allgemeine und Bodenmikrobiologie
Applies to degree courses/semesters	Profil, Master (2./4.)
Module coordinator	Prof. Dr. Sylvia Schnell
Instructors	Prof. Dr. Schnell, AkOR Dr. Benckiser, Prof. Dr. Kunz, Prof. Dr. Wenzel
Prerequisites for participation	Basic knowledge in microbiology
Course aims	Students will: • 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) • understand the complexity of human microbiota also in relation to age, sex and disease • gain insight of the microbe interactions with epithel and paneth cells and about cell mediated immunity • become familiar with features of probiotic bacteria and bacteria causing food contamination • receive knowledge about de-radicalisation in the intestine by flavonoides and other nutritional compounds by • have practical experience with various microbial and molecular techniques to quantify and characterize bacteria.
Module content	• Intestine systems of humans, ruminants and insects • Physiology and interactions of bacteria in the intestine • Knowledge on human microbiota based on latest publications • Cell mediated immunity • Role of flavonoids and other nutritional compounds • Methods for cultivation and identification of microorganisms
Forms of instruction	Vorlesung (22%), Praktikum (78%)

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	20	30			
	Seminar					
	Practical training	70	10			
	exercises					
	Study trip					
	Homework					
		90	40	20	30	**180 / 6 CP**

Module examination		
	Form(s) of assessment	a) written examination or b) other examinations conducted by the teaching staff (see SpezO § 8).
	Components of final grade	written examination (100 %)
	Form of module component retake examination	
	Form of module retake examination	written examination oder Wiederholung/Überarbeitung der in b) festgesetzten Prüfungsleistung.

Frequency	SoSe	Duration 1 Semester	
Intake capacity	30		
Language of instruction	English		
Website	http://www.uni-giessen.de/fbr09/mikrobiologie/schnell.html		

MP 076 - Laboratory Course: Tissue Culturing and Genetic Transformation						**. Sem.; 3./4. Sem.;**	**6 CP**
English Module Title		Laboratory Course: Tissue Culturing and Genetic Transformation					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Phytopathologie / Phytopathologie					
Applies to degree courses/semesters		Profil, Master (3./4.)					
Module coordinator		Prof. Dr. Karl-Heinz Kogel					
Instructors		Prof. Dr. Kogel, Dr. Imani					
Prerequisites for participation		Molecular Phytopathology (MK 57), Plant Protection and Bioengineering (MK 15)					
Course aims		Students will • have practical knowledge of the methods, strategies, and laboratory techniques for plant and microbe transformation • be able to understand technical 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		• guidance for the risk management of genetic engineered plant and microorganisms • practical training in plant transformation • 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 confocal laser microscopy • practical training in transgene function assessment					
Forms of instruction		Vorlesung (8%), Seminar (8%), Praktikum (83%)					
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	5	90				
	Seminar	5					
	Practical training	50					
	exercises						
	Study trip						
	Homework						
		60	90		30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) written examination, seminar work and experimental success (each part must be sufficient) or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	written examination (50%), seminar work and experimental success (50%)					
	Form of module component retake examination	repeat/revision of the failed examination part					
	Form of module retake examination	oral examination or repeat/revision of the examination as described in b).					
Frequency		WiSe			Duration 2 weeks full time laboratory course		
Intake capacity		30					
Language of instruction		English					
Website		www.uni-giessen.de/ipaz					

MP 077 - Laboratory Course: Methods in Molecular Phytopathology				**3./4. Sem.;**	**6 CP**
English Module Title	Laboratory Course: Methods in Molecular Phytopathology				
Faculty / chair / department	Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Phytopathologie / Phytopathologie				
Applies to degree courses/semesters	Profil, Master (3./4.)				
Module coordinator	Prof. Dr. Karl-Heinz Kogel				
Instructors	Prof. Dr. Kogel, Dr. Aline Koch, Dr. Jens Steinbrenner				
Prerequisites for participation	Molecular Phytopathology (MK 57), Plant Protection and Bioengineering (MK 15)				
Course aims	Students will • become acquainted with plant pathogenic fungi using tools of molecular genetics know fundamental principles of molecular cloning and related laboratory techniques • know different biotechnological strategies in plant protection • have broad knowledge of the interaction between plants and pathogens • gain knowledge about pathogen effector molecules and their targets in the host cell • gain knowledge about protein-protein interactions				
Module content	• practical training in plant and microbe gene cloning methods • practical training in detection methods of DNA and RNA • practical training in biotechnological plant protection strategies • practical training in bioinformatics related to sequence similarities and diagnostic matter • practical training in inoculation methods • practical training in detection of protein-protein interactions				
Forms of instruction	Vorlesung (8%), Seminar (8%), Praktikum (83%)				
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	5	90			
Seminar	5				
Practical training	50				
exercises					
Study trip					
Homework					
	60	90		30	**180 / 6 CP**
Module examination – Form(s) of assessment	a) written examination, seminar work and experimental success (each part must be sufficient) or b) other examinations conducted by the teaching staff (see SpezO § 8).				
Components of final grade	written examination (50%), seminar work and experimental success (50%)				
Form of module component retake examination	repeat/revision of the failed examination part				
Form of module retake examination	oral or written examination or repeat/revision of the examination as described in b).				
Frequency	WiSe		Duration 2 weeks full time laboratory course		
Intake capacity	30				
Language of instruction	English				
Website	www.uni-giessen.de/ipaz				

MP 087 - Global Nutrition and Agriculture						**1.-4. Sem.;**	**6 CP**
English Module Title		Global Nutrition and Agriculture					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Umweltpolitik					
Applies to degree courses/semesters		Profil, Master (1.-4.)					
Module coordinator		Prof. Dr. Ernst-August Nuppenau					
Instructors		Prof. Dr. Nuppenau, Prof. Dr. Krawinkel					
Prerequisites for participation		None					
Course aims		The students • know the determinants of food and nutrition security, • are able to make estimates of the regional food requirements and the carrying capacity, • are able to overlook the associations between health and nutrition, • have an overview about structures and strategies of nutrition promotion.					
Module content		• global nutrition a challenge for agricultural development • food requirements, natural resources and population • regional potential of food production • technology development, institutions and human capital • sectoral developement strategies, agriculture and nutrition • commercialisation of agriculture, cash-crop- vs. food-crop-debate • international labour division and nutrition security • nutrition security and health • migration and malnutrition • cultural, economic and social determinants of nutrition • breastfeeding and nutrition security • nutrition security and food aid • development aid approaches • international organisations for nutrition security and agricultural development Excursion to Rome or Geneva (participation optional)					
Forms of instruction		Vorlesung (50%), Seminar (50%)					
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	30	40				
	Seminar	30					
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	40	50	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Written exam or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Written exam (100 %)					
	Form of module component retake examination						
	Form of module retake examination	Written exam or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 semester			
Intake capacity		non limited					
Language of instruction		English					
Website		http://www.uni-giessen.de/cms/fbz/fb09/institute/ernaehrungswissenschaft/ag/krawinkel					

MP 090 - Insect Biotechnology					**3./4. Sem.;**	**6 CP**
English Module Title		Insect Biotechnology				
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Insektenbiotechnologie / Angewandte Entomologie				
Applies to degree courses/semesters		Profil, Master (3./4.)				
Module coordinator		Prof. Dr. Andreas Vilcinskas				
Instructors		Prof. Dr. Vilcinskas, Dr. Rahnamaeian, Dr. Mukherjee				
Prerequisites for participation		Basic knowledge in zoology, biotechnology				
Course aims		Students will • get an introduction to insect biotechnology • learn about biotechnological applications of insect-derived bioresources in medicine, agriculture, and industry • learn about the importance of genetic and epigenetic tools in model insect species with relevance to human diseases and anti-infectives • learn to synthesize and prepare the seminar work on insect biotechnology and molecular entomology				
Module content		• concepts of insect biotechnology and relevant basics in insect immunity, physiology and epigenetics • application of insect-derived bioresources in medicine, agriculture and industry • a molecular view on insect-pathogen interactions insects as model host for human pathogens				
Forms of instruction		Vorlesung (60%), Seminar (40%)				
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	36	60			
	Seminar	24	30			
	Practical training					
	exercises					
	Study trip					
	Homework					
		60	90		30	**180 / 6 CP**
Module examination	Form(s) of assessment	a) seminar work, written exam or b) other examinations conducted by the teaching staff (see SpezO § 8).				
	Components of final grade	seminar work (50 %), written exam (50 %)				
	Form of module component retake examination					
	Form of module retake examination	oral or written examination or repeat/revision of the examination as described in b).				
Frequency		WiSe		Duration 1 Semester		
Intake capacity		not limited				
Language of instruction		English				
Website		http://www.uni-giessen.de/ipaz				

MP 097 - Microbial Diagnostics						**3./4. Sem.;**	**6 CP**
English Module Title		Microbial Diagnostics					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Angewandte Mikrobiologie / Mikrobiologie der Recycling-Prozesse					
Applies to degree courses/semesters		Profil, Master (3./4.)					
Module coordinator		Prof. Dr. Dr. Peter Kämpfer					
Instructors		Prof. Dr. Dr. Kämpfer					
Prerequisites for participation		none					
Course aims		Students • will have detailed knowledge of the fundamentals of microbial diagnostics • will know quality standards and inspection measures in the fields of environmental technologies and food microbiology • will learn methods of quantification and qualification of bacteria with cultivation-dependent and cultivation-independent methods					
Module content		• microbiological diagnostics (conventional and molecularbiological methods in the context of quality management measures), microbial contamination of food and the environment, in everyday life and in the working environment (legal foundations and standards) • quantification and qualification of biotechnologically important microorganisms; identification of bacteria with conventional and molecularbiological methods; enzyme detection, bacteriological analyses in the context of microbiological quality control					
Forms of instruction		Vorlesung (50%), Seminar (50%)					
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	30	60				
	Seminar	30					
	Practical training						
	exercises						
	Study trip						
	Homework						
		60	60	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) seminar work, written examination or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	seminar work (20 %), written examination (80 %)					
	Form of module component retake examination						
	Form of module retake examination	written examination or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		30					
Language of instruction		English					
Website		https://www.uni-giessen.de/cms/fbz/fb09/institute/mikrobiologie/recycling-prozesse					

MP 098 - Molecular Plant Breeding						**1.-4. Sem.;**	**6 CP**
English Module Title		Molecular Plant Breeding					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Pflanzenbau und Pflanzenzüchtung I / Pflanzenzüchtung					
Applies to degree courses/semesters		Profil, Master (1.-4.)					
Module coordinator		Prof. Dr. Rod Snowdon					
Instructors		Prof. Dr. Snowdon, Dr. Christian Obermeier					
Prerequisites for participation		MP 20 (recommended), MK16 (compulsory)					
Course aims		The students • will gain practical and/or theoretical experience in DNA and RNA extraction and analysis techniques, PCR, genetic mapping and QTL analysis, DNA hybridisation, gene expression and next-generation sequencing • will learn practical applications of biotechnological and molecular genetic methods in plant breeding • will 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 • Next-generation DANN sequencing • Molecular marker analysis, genome mapping and QTL analysis • DNA filter hybridisation, genome libraries • Quantitative real-time PCR • New methods of gene technology in plant breeding: Genome editing, cis-genestics					
Forms of instruction		Vorlesung (43%), Praktikum (57%)					
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	30	20				
	Seminar						
	Practical training	40	30				
	exercises						
	Study trip						
	Homework						
		70	50	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Lab protocol, oral exam or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Lab protocol (50 %), oral exam (50 %)					
	Form of module component retake examination						
	Form of module retake examination	Oral exam or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		30					
Language of instruction		English					
Website		http://www.uni-giessen.de/cms/fbz/fb09/institute/plantbreeding/ipz/					

MP 100 - Bioinformatics						**1.-4. Sem.;**	**6 CP**
English Module Title		Bioinformatics					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Pflanzenbau und Pflanzenzüchtung II / Biometrie und Populationsgenetik mit dem Schwerpunkt Bioinformatik					
Applies to degree courses/semesters		Profil, Master (1.-4.)					
Module coordinator		Prof. Dr. Matthias Frisch					
Instructors		Dr. Birgit Samans, Prof. Dr. Matthias Frisch					
Prerequisites for participation		Basics in biostatistics and bioinformatics					
Course aims		Students • have basic programming skills in R • have knowledge about different high throughput technologies and their application areas in natural sciences • are able to design high throughput experiments • have basic knowledge about the analysis of high dimensional data sets • have knowledge about the functional interpretation of gene lists					
Module content		• Programming and data analysis in R • Introduction in different high throughput technologies and their application areas • Design of high throughput experiments • Applying of public R packages for the preprocessing and statistical analysis of high dimensional data sets • Functional interpretation of the results using web-based or R-based programming tools					
Forms of instruction		Vorlesung (50%), Praktikum (50%)					
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	30	30				
	Seminar						
	Practical training	30	30				
	exercises						
	Study trip						
	Homework						
		60	60	30	30	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) Weekly exercises (12), written examination or b) other examinations conducted by the teaching staff (see SpezO § 8).					
	Components of final grade	Exercises (30 %), written examination (70 %)					
	Form of module component retake examination						
	Form of module retake examination	Written examination or repeat/revision of the examination as described in b).					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		not limited (PC-Exercises in groups of size 20)					
Language of instruction		English					
Website		http://www.uni-giessen.de/population-genetics					

MP 126 - Selection for disease resistance in farm animals					**3./4. Sem.;**	**6 CP**
English Module Title		Selection for disease resistance in farm animals				
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Tierzucht und Haustiergenetik / Haustier- und Pathogenetik				
Applies to degree courses/semesters		Profil, Master (3./4.)				
Module coordinator		Prof. Dr. Gesine Lühken				
Instructors		Prof. Dr. Gesine Lühken				
Prerequisites for participation		Basic knowledge of genetics and molecular genetics; MP33 (recommended)				
Course aims		The students • will know phenotypic parameters and molecular mechanisms underlying genetic differences in disease susceptibility • will have practical experience in sample collection, laboratory and data analysis • will be able to assess different strategies for identification of indirect and direct markers for disease susceptibility • will be able to asses and design scientific research projects on disease resistance in farm animals				
Module content		• barriers of infections, innate and acquired immunity • genetics of disease susceptibility • phenotypic parameters for diagnosis of host infection/susceptibility status • practical training: sample collection from farm animals (e. g. sheep, cattle), laboratory analysis of phenotypic parameters for infection/susceptibility status, data analysis • strategies for identification of indirect and direct genetic markers for disease resistance				
Forms of instruction		Vorlesung (67%), Praktikum (33%)				
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	33	66			
	Seminar					
	Practical training	16	24			
	exercises					
	Study trip					
	Homework		11			
		49	101		30	**180 / 6 CP**
Module examination	Form(s) of assessment	a) exercises and written examination (optionally in English or in German language) or b) other examinations conducted by the teaching staff (see SpezO § 8).				
	Components of final grade	exercises (30 %), written examination (70 %)				
	Form of module component retake examination					
	Form of module retake examination	written examination or repeat/revision of the examination as described in b)				
Frequency		WiSe		Duration 1 Semester		
Intake capacity		30				
Language of instruction		English (for examination, English or German language can be elected individually)				
Website		https://www.uni-giessen.de/cms/fbz/fb09/institute/ith/ag-luehken				

MP B 145 - Methods of Regional Analysis and Planning						**1.-4. Sem.;**	**6 CP**
English Module Title		Methods of Regional Analysis and Planning					
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Agrarpolitik und Marktforschung / Agrar- und Entwicklungspolitik					
Applies to degree courses/semesters		Profil, Master (1.-4.)					
Module coordinator		Prof. Dr. P. Michael Schmitz					
Instructors		apl. Prof. Harsche, PD Grandke					
Prerequisites for participation		none					
Course aims		Students will • recognize the necessity and purpose of demarcation and differentiations of rural regions • have knowledge of the major methods of region differentiation • know key analytic parameters for describing regional structures • be able to apply quantitative methods for the analysis and forecasting of regional developments • recognize the necessity of evaluation within the scope of regional and environmental planning • be able to assess the advantages and disadvantages of various evaluation methods • be able to select and apply adequate evaluation methods for various regional and environmental Planning • consider the basics of project management					
Module content		• principles of regional grouping and differentiation] • methods of regional demarcation • statistical parameters of regional analysis • complex indicators for describing regional structures • methods of regional structural analysis • regional models • foundations of welfare theory • evaluation methods • application of evaluation methods to examples of regional and environmental planning • project management in regional and environmental planning					
Forms of instruction		Vorlesung (67%), Übung (33%)					
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	40	40				
	Seminar						
	Practical training						
	exercises	20	40				
	Study trip						
	Homework						
		60	80	20	20	**180 / 6 CP**	
Module examination	Form(s) of assessment	a) written examination, paper or b) other examinations conducted by the teaching staff (see SpezO § 8)					
	Components of final grade	written examination (80 %), paper (20 %)					
	Form of module component retake examination						
	Form of module retake examination	oral examination or repeat/revision of the examination as described in b)					
Frequency		WiSe		Duration 1 Semester			
Intake capacity		not limited					
Language of instruction		English					

MP B 147 - Isotopenhydrologie					**3./4. Sem.;**	**6 CP**
English Module Title		Isotope hydrology				
Faculty / chair / department		Agrarwissenschaften, Ökotrophologie und Umweltmanagement / Institut für Landschaftsökologie und Ressourcenmanagement / Landschafts-, Wasser- und Stoffhaushalt				
Applies to degree courses/semesters		Profil, Master (3./4.)				
Module coordinator		Prof. Dr. Lutz Breuer				
Instructors		Prof. Dr. Lutz Breuer, Dr. Natalie Orlowski				
Prerequisites for participation		Keine				
Course aims		Die Studierenden • arbeiten sich vertieft in ein aktuelles Spezialgebiet der Umweltwissenschaften ein, • können aktuelle Publikationen aus dem Forschungsgebiet bewerten, • können ein aktuelles Thema als Übersicht ausarbeiten.				
Module content		• Anwendung stabiler Isotope in den Umweltwissenschaften • Grundlagen der Isotopenhydrologie • Datenerhebung der isotopischen Zusammensetzung von Gewässer-, Boden-, und Pflanzenproben im Feld • (Isotopen-)Probenanalysen im Labor und Ergebnisinterpretation				
Forms of instruction		Vorlesung (50%), Seminar (50%)				
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	30	45			
	Seminar	30	45			
	Practical training					
	exercises					
	Study trip					
	Homework					
		60	90		30	**180 / 6 CP**
Module examination	Form(s) of assessment	a) Klausur und Seminararbeit oder b) Prüfungsleistung nach Maßgabe des Lehrenden (siehe SpezO § 18).				
	Components of final grade	Klausur (50 %), Seminararbeit (50 %)				
	Form of module component retake examination					
	Form of module retake examination	Klausur oder Wiederholung/Überarbeitung der in b) festgesetzten Prüfungsleistung.				
Frequency		WiSe		Duration 1 Semester		
Intake capacity		30				
Language of instruction		Deutsch oder Englisch				
Website		https://www.uni-giessen.de/cms/fbz/fb09/institute/ilr/wasser				