Module descriptions

M.Sc. degree programme

"Sustainable International Agriculture"

of the University of Kassel and the Georg-August University of Göttingen

Version 2011

organicagriculturalsciences UNIKASSEL

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

A01 Organic livestock farming under temperate and tropical conditions

Module	**Organic livestock farming under temperate and tropical conditions**
Code	**A01**
Coordinator	**Prof. Dr. A. Sundrum**
Language	English
Stud. Workload	180h (60 h contact time)
Credits	6 ECTS
Frequency (WS/SS)	SS
Part module 1	Animal welfare
Duration (contact h)	15
Instructor 1	Prof. Dr. U. Knierim
Contents 1	Principles of animal welfare in relation to organic farming; scientific methods of welfare assessment.
Objectives 1	Students have a basic understanding of animal welfare, familiarize with practical problems and scientific concepts including how to assess animal welfare both at farm and system level.
Literature 1	Appleby, M.C., Hughes, B.O. (eds) 1997: Animal welfare. CAB International, Wallingford; Vaarst, M. et al. (eds.) 2004: Animal health and welfare in organic Agriculture. CAB International, Wallingford
Part module 2	Advances in animal nutrition and animal health
Duration (total h)	15
Instructor 2	Prof. Dr. A. Sundrum
Contents 2	Organic livestock production in Europe; possibilities and limitations within organic farming to ensure a high level of animal health; strategies within animal nutrition to increase the efficiency in the use of limited resources; system-oriented approach versus technical approaches.
Objectives 2	Students get to know scientific tools for quantifying, assessing and evaluating problems within organic livestock production.
Literature 2	Vaarst, M., Roderick, S., Lund, V., Lockeretz, W. (eds.) 2004: Animal health and welfare in organic agriculture. CABI Publishing
Part module 3	Sustainable forage production systems
Duration (contact h)	15
Instructor 3	Prof. Dr. M. Wachendorf
Contents 3	- Design and management of a sustainable forage production - Management of forage quality and biodiversity on grassland - Minimizing nutrient losses towards water and atmosphere
Objectives 3	Students are able to assess the relationships between sward management and structural (yield, botanical composition) and functional (nutrient efficiency) sward characteristics.
Literature 3	Hopkins, A. 2000: Grass, its production and utilization. Blackwell Science, Oxford, UK; Cherney J.H. 1998: Grass for Dairy Cattle CABI Publishing, Exon, UK; Frame, J. 1992: Improved Grassland Management. Farming Press Books, Ipswich, UK.
Part module 4	Organic livestock farming in the (sub)tropics
Duration (contact h)	15
Instructor 5	Prof. Dr. E. Schlecht
Contents 5	- Characterization and evaluation of organic livestock farming systems in different southern regions/countries; - Pros and cons of organic livestock farming under different bio-physical and socio-economic conditions
Objectives 5	Students are able to decide under which conditions organic livestock farming can be introduced in (sub)tropical countries or regions.
Literature 5	Diverse articles about case studies distributed via E-learning platform

Study system usability	Economy	Organic	Tropical
	E	C	E
Entrance requirements	Basic knowledge (B.Sc level) of soil, plant and animal sciences		

Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project
Duration [contact h]	60					

Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
Grade composition	x	x						
	100% oral test or written test							

A02M Epidemiology of International and Tropical Animal Infectious Diseases

Module	**Epidemiology of International and Tropical Animal Infectious Diseases**						
Code	**A02M**						
Coordinator	**Prof. Dr. Dr. C.-P. Czerny**						
Language	English						
Stud. workload	180h (56h contact time)						
Credits	6 ECTS						
Frequency (WS/SS)	WS						
Instructor	Prof. Dr. Dr. C.-P. Czerny						
Contents	Infectious diseases play an enormous role in international animal health control. National health and veterinary authorities, as well as international organizations (WHO, FAO) are very much involved in the surveillance of epidemics and establishment of health and hygiene monitoring programs. These efforts will increase in future, because of a further globalization of international markets, and will require well-educated experts collaborating worldwide in this multidisciplinary field. This module will give a generalized view of current epidemics together with a specialized understanding of infectious diseases and hygienic programs in subtropical and tropical countries. Characteristics of the biology of relevant infectious agents like parasites, fungi and bacteria together with their toxins, viruses, and prions will be presented in detail. Some of these germs included in this unit cause severe zoonotic diseases with a lethal danger for humans. Immunological host-defence mechanisms of wild and domestic farm animals against pathogens will be discussed together with modern strategies of active and passive immunizations. Diagnostic methods presently available and new biotechnological approaches in future assay and vaccine development will be demonstrated. The adaptation of practical health and standardized quality management processes to various animal production systems (ruminants, pigs, poultry) and the corresponding management measurements will be explained. The view will deeply focus on environmental impacts (water, soil, air hygiene), epizootiology and modern tools in epizootiological research. It will include biology and eradication of vectors (insects, ticks) transmitting pathogens of animal and zoonotic diseases, as well as biological and chemical methods for vector control. In a laboratory course this module will also communicate well-established techniques of microbiological and parasitological diagnostics. Students will be practically trained in classical methods and in modern biochemical, immunological, biotechnological and molecular biological techniques for the detection of infectious agents, toxins and noxious substances. Tissue culture procedures for vaccine or antibody development are also used. Modification of livestock-environment interactions through human management are discussed						
Objectives	Based on a scientific and practical up-to-date level, students know to evaluate and develop modern and effective livestock hygiene and husbandry concepts and to integrate them into complex quality management programs. Graduates are competent to implement and to communicate their knowledge in a multidisciplinary occupational area establishing epizootic control programs.						
Literature	Lecture based materials.						
Study system usability	Economy		Organic		Tropical		
	-		E		M		
Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences						
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project	
Duration [contact h]	56			28 (optional)			
Examination type	Oral test	Written test	Homework	Presentation	Protocol	Work report	Proj. report	Proj. pres.
	x							
Grade composition	100% oral test						

A03M International and Tropical Food Microbiology and Hygiene

Module	**International and Tropical Food Microbiology and Hygiene**							
Code	**A03M**							
Coordinator	**Prof. Dr. Dr. C.-P. Czerny**							
Language	English							
Stud. workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. Dr. C.-P. Czerny							
Contents	Infectious and toxic pathogens cause most of the food-borne impacts on human health all over the world. Global markets require an international surveillance system together with standardized food hygiene regulations. This module will give a generalized view of currently and internationally relevant food-borne zoonotic diseases, epidemics and food hygiene programs together with a specialized view to the conditions in subtropical and tropical countries. The biology of infectious agents (parasites, fungi, yeasts, bacteria, viruses, prions, together with their toxins) responsible for contaminations and intoxications of human food of animal origin will be discussed in detail. Some of these germs cause severe zoonotic diseases with a lethal potential for humans or certain age groups. Special characteristics of germ resistance in the food matrices meet, milk, eggs, and in the corresponding products are elucidated along to the complete manufacturing processes from stable to table. Deterioration and spoilage of foodstuffs by microorganisms will be discussed as well. Diagnostic methods presently available for the detection of contaminated or spoiled nourishments and new biotechnological approaches in future assay designs will be analysed. The adaptation of practical hygiene and standardized quality management adjustment factors to various animal production systems (ruminants, pigs, poultry) as well as to the subsequent production processes will be explained together with the corresponding management measurements. This includes food conservation procedures, germ depletion and eradication techniques (cleaning, disinfection, autoclaving, sterilization). Beside negative microbial effects influencing food quality, positive effects especially of bacteria and fungi in food production will also be presented. Biotechnological aspects of genetic engineering of foodstuff supplements or directed genetic germ design will be discussed. In a laboratory course on food microbiology, this module will also communicate well-established techniques of microbiological and parasitological diagnostics in food matrices. Students will be practically trained in classical methods and in modern biochemical, immunological, biotechnological and molecular biological techniques for the detection of food-borne infectious agents, toxins and noxious substances.							
Objectives	Based on a scientific and practical up-to-date level, students know to evaluate and develop modern and effective food hygiene concepts and to integrate them into complex quality management programs. Graduates are competent to implement and to communicate their knowledge in a multidisciplinary occupational area establishing epizootic control programs in food microbiology and hygiene. They are able to understand international experts of public health authorities and collaborate in international and multidisciplinary platforms including control, monitoring, and research.							
Literature	Lecture based materials.							
Study system usability	Economy			Organic			Tropical	
	-			E			M	
Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences							
Instruction type	Lecture		Seminar		Excursion	Practice	Tutorial	Project
Duration [contact h]	56					28 (optional)		
Examination type	Oral test	Written test	Homework	Presentation		Protocol	Work report	Proj. report	Proj. pres.
	x								
Grade composition	100% oral test							

A04 Livestock reproduction physiology

Module	**Livestock reproduction physiology**							
Code	**A04**							
Coordinator	**Prof. Dr. C. Knorr**							
Language	English							
Stud. Workload	180 h (56 h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. C. Knorr, Prof. Dr. Dr. M. Gauly							
Contents	Functional anatomy of reproduction; physiology of reproduction in livestock (hormones, growth factors, ovigenesis and fertilization, spermatogenesis, reproductive cycles, mating behaviour, fertilization, gestation, prenatal physiology, parturition, postpartum recovery, lactation); assisted reproductive technologies (artificial insemination, pregnancy diagnosis, preservation of embryos, embryo transfer, in vitro fertilization, sexing, cloning, transgenics); stem cells; ethics.							
Objectives	Strong foundation in reproduction physiology; develop creative potential and foster independent thought; skills enabling students to gather and integrate information to solve problems; effective communication skills; self learners; awareness of global issues driving changes in livestock sciences.							
Literature	Hafez B., Hafez, E.S.E. 2000: Reproduction in Farm Animals 7th ed. Lippincott Williams & Wilkins Publishing; Bearden, H.J., Fuquay, J.W., Willard, S.T. 2004: Applied Animal Reproduction, 6th ed. Pearson Prentice Hall Publishing; Squires, E.J. 2003: Applied Animal Endocrinology 1st ed. CABI Publishing; Pineda, M.H., Dooley, M.P. 2003: Mc Donald's Veterinary Endocrinology and Reproduction 5th ed. Blackwell Publishing.							
Study system usability	Economy			Organic			Tropical	
	-			E			M	
Entrance requirements	Basic knowledge of animal sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	40			8		8		
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
		x							
Grade composition	100% written test							

A05 Aquaculture in the tropics and subtropics

Module	**Aquaculture in the tropics and subtropics**								
Code	**A05**								
Coordinator	**Prof. Dr. G. Hörstgen-Schwark**								
Language	English								
Stud. Workload	180h (56h contact time)								
Credits	6 ECTS								
Frequency (WS/SS)	SS								
Instructor	Prof. Dr. G. Hörstgen-Schwark								
Contents	This module provides an introduction to aquaculture in the tropics and subtropics with a focus on fresh-water fish farming. This resource can be managed independently or integrated with other ecological and socioeconomic aspects. The module covers: - biological and ecological principles - aquaculture and aqua-agriculture systems - tropical fish candidates and their performance in relation to production systems - specific breeding and raising methods - functions and products of aquaculture								
Objectives	Students get to know basic principles of aquaculture and the ecological and socio-economic aspects of this resource utilization. They see the functions of aquaculture in system relationship and know the distinct utilisation variants. They are capable of analysing the advantages and disadvantages of the different aquaculture systems and are able to evaluate the possibilities of a sustainable intensification of such systems in a multidisciplinary approach.								
Literature	Lecture based notes								
Study system usability	**Economy**			**Organic**			**Tropical**		
	E			**E**			**M**		
Entrance requirements	Basic knowledge of animal sciences								
Instruction type	Lecture		Seminar		Excursion		Practice	Tutorial	Project
Duration [contact h]	42				8		6		
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x								
Grade composition	100% oral test								

A06 Global Aquaculture Production, Markets and Challenges

Module	**Global Aquaculture Production, Markets and Challenges**							
Code	**A06**							
Coordinator	**Prof. Dr. G. Hörstgen-Schwark**							
Language	English							
Stud. Workload	180 (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	Prof. Dr. G. Hörstgen-Schwark							
Contents	The production of the world wide most important aquaculture species and ornamentals (i.e. kelp, water hyacinths, water salad, oysters, clams, carp, tilapia, salmon, trout, *Litopenaeus vannamei, Penaeus monodon*), their distribution channels; national and international markets and trade with aquatic products; international trading agreements, law and their compliance; national and international legislation for the protection of the aquatic environment; aquatic animal health, trade and transboundary issues. Through case studies: Trends and developments of sector management (influence of national authorities, NGOs, societies, communities); socioeconomic impact of aquaculture; contribution to national food self-sufficiency; energy and resource efficiency in aquaculture; environmental management of aquaculture.							
Objectives	Students get to know the worldwide most important aquaculture organisms and their prevalent production systems. They learn which national and international regulatory mechanisms influence the trade with aquatic products. Through the work on case studies and their presentations students obtain the capability to evaluate problems, chances and socioeconomic impacts of a globalized and sustainable aquaculture; they are enabled to independently get acquainted with scientific subjects and to apply the acquired knowledge for the consideration of complex conflicts of interest.							
Literature	Lecture based notes							
Study system usability	**Economy**			**Organic**			**Tropical**	
	E			**E**			**M**	
Entrance requirements	Basic knowledge of animal sciences and agricultural markets							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28		28					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x							x
Grade composition	67% oral test, 33% project presentation							

A07 Unconventional livestock and wildlife - management, utilisation and conservation

Module	**Unconventional livestock and wildlife - management, utilisation and conservation**							
Code	**A07**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS, every second year, alternating with the module “Socio-ecology of livestock productions systems”							
Instructor	Dr. C. Hülsebusch							
Contents	History of domestication of livestock. Unconventional livestock in Asia/Oceania, Africa and Latin America: Biology, management, production systems. Commercial and subsistence products from little known domesticated animal species – such as insects, snails, reptiles, rodents up to little used ungulates. Local and national economic potential and contribution to local livelihoods. Wildlife in Asia, Africa and Latin America: Biology, wildlife demography and modelling of population dynamics, human/wildlife conflicts, international conventions on (agro)-biodiversity and conservation, strategies for wildlife conservation through utilisation, different wildlife utilisation concepts, wildlife based tourism, terminal wildlife utilisation of different intensity ("Hunting/Trophy hunting", "Game-Ranching", "Game Farming", "Feedlot" with beginning domestication), community-based utilisation *cum* conservation approaches. Contribution of wildlife utilisation to the livelihood of rural communities. Regulations, possibilities and constraints for wildlife conservation.							
Objectives	Based on the development of agriculture, particularly the domestication of animals, students know the differences between livestock and wildlife and the importance and potential of unconventional livestock and wildlife for rural development and human livelihoods in different regions of the world. Students obtain an overview over the wide variety of unconventional livestock, their adaptive features, biology and ecology and the various production systems under which they are kept. Students familiarize with the variety of wildlife species, their biology, ecology and population dynamics and the potential of their exploitation. They know the major international conventions pertaining to wildlife conservation and are familiar with the nature and magnitude of human/wildlife conflicts. They know about costs and benefits associated with human-wildlife-co-existence and understand the dilemma between (inter-)national conservation objectives and local household livelihood objectives. Students obtain an overview over different terminal and non-terminal options of wildlife utilisation and management and their respective potential contribution to the above conflicting objectives.							
Literature	Diamond, J. 1999: Guns, Germs, and Steel: The Fates of Human Societies. W.W.Norton and Company, New York, 480 p.; Board on Science and Technology for International Development 1991: Microlivestock Little-Known Small Animals with a Promising Economic Future. National Academy Press, Washington D.C., 449; Bonner, R.. 1993: At the Hand of Man - Peril and Hope for Africa's Wildlife. Alfred A. Knopf Inc., New York, 322 p.; Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973/1979 at http://www.cites.org/ (incl. appendices)							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30		10	8		12		
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x		x				
Grade composition	70% written test, 30% sem. speech							

A08 Socio-ecology in livestock production systems

Module	**Socio-ecology in livestock production systems**							
Code	**A08**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS, every second year; alternating with the module "Unconventional livestock and wildlife management"							
Instructor	PD Dr. B. Kaufmann							
Contents	Theoretical background of the socio-ecological system view: System theory, 1st and 2nd order cybernetics, complex adaptive systems, human activity systems. Actor oriented approach to understand and influence low external input systems: - Local knowledge and situated practices - Methodology for understanding local knowledge: Second order observation and knowledge analysis - Collaborative learning: Exchange between knowledge systems, dialogue, action research, livestock farmer experimentation, participatory monitoring and evaluation Modelling of livestock systems as tool for collaborative learning: Bio-economic modelling, multi-agent modelling, role plays.							
Objectives	Students understand livestock systems as socio-ecological systems in which livestock farmers through *their actions* establish, maintain and develop the respective production system. Consequently, these so-called human activity systems are assessed using an actor oriented approach. Emphasis of this module is on methods that are used to analyse and improve livestock farmers' management. This serves to understand "why livestock farmers do what they do" and "how livestock farmers produce". Students learn how they can make use of the knowledge of livestock farmers to better understand how low external input systems work. Collaborative learning is introduced as methodology to develop human activity systems in a transdisciplinary research approach. They deal with the question of how mutual understanding between livestock farmers and scientists can be achieved despite the different knowledge systems. Students obtain a profound insight into methods for farmer experimentations in which livestock farmers and scientists collaborate, and into using computer models as learning tools for ex-ante assessment of improvement measures in community based approaches. In w*hat – if* analyses the change of action rules on the performance of socio-ecological systems is assessed.							
Literature	Kaufmann, B.A. 2007: Cybernetic analysis of socio-biological systems: The case of livestock management in resource poor systems. In: Kommunikation und Beratung, Volume 81, Margraf Publishing; McCown, R.L. 2002: Changing systems for supporting farmers' decisions: problems, paradigms and prospects. Agricultural Systems 74: 179-220; Wiener, N. 1948: Cybernetics or control and communication in the animal and the machine. John Wiley, New York.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	30	10		20				
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x		x				
Grade composition	70% written test, 30% sem. speech							

A09 Sustainability in organic livestock production under temperate conditions

Module	**Sustainability in organic livestock production under temperate conditions**
Code	**A09**
Coordinator	**Prof. Dr. U. Knierim**
Language	English
Stud. Workload	180h (60h contact time)
Credits	6 ECTS
Frequency (WS/SS)	SS
Part module 1	Animal welfare
Instructor 1	Prof. Dr. U Knierim
Contents 1	Ethics, scientific concepts and methods in animal welfare research, comparative animal husbandry
Objectives 1	Students gain an understanding of the ethical and biological basis of animal welfare and of scientific animal welfare concepts and methods. They achieve an overview over common housing and management systems, their welfare advantages and disadvantages with special reference to organic husbandry.
Literature 1	Appleby, M.C., Hughes, B.O. (eds) 1997: Animal welfare. CAB International, Wallingford; Vaarst, M. et al. (eds.) 2004: Animal health and welfare in organic Agriculture. CAB International, Wallingford UK.
Part module 2	System approach in livestock production
Instructor 2	Prof. Dr. A. Sundrum
Contents 2	Basics of system theory; how to define an open system; how to assess the performance of a system; emergent properties of farm systems; differences between technical and systematic approaches in livestock production with respect to different production goals; possibilities and limitations of a systematic approach to improve animal health and the efficiency in the use of limited resources.
Objectives 2	Reflection on the differences between different approaches in livestock production from a scientific and from a practical perspective and their implications on the implementation of production goals in dependence on different farm types.
Literature 2	Bertalanffy, von L. 1968: General System Theory - Foundations, Development, Application. George Braziller, New York, 295 p.; Bawden, R.J. 1991: System thinking and practice in agriculture. J. Dairy Sci., 74**,** 2362-2373; Fromm, J. 2004: The emergence of complexity. Kassel University Press, Kassel, Germany; Sundrum, A. 2008: System approach in organic livestock production (in preparation)

Study system usability	Economy	Organic	Tropical
	E	M	-

Entrance requirements	Basic knowledge (B.Sc. level) of animal sciences					
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project
Duration [contact h]		60				

Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x		x	x				
Grade composition	50% oral test, 50% homework or seminar speech							

A10 Livestock nutrition and breeding under (sub-) tropical conditions

Module	**Livestock nutrition and management under (sub-) tropical conditions**
Code	**A10**
Coordinator	**Prof. Dr. Eva schlecht**
Language	English
Stud. Workload	180h (60h contact time)
Credits	6 ECTS
Frequency (WS/SS)	WS
Instructors	Prof. Dr. E. Schlecht, Prof. Dr. S. König, Dr. A. Schiborra, Dr. T. Pinent
Contents	This module analyses the physiological basis of livestock husbandry in the Tropics and Subtropics. The adaptation of the most widely used livestock species (cattle, small ruminants, camelids, buffalo, poultry, pigs) to the climatic conditions and to qualitatively and quantitatively variable fodder supply is studied. The importance of pathogens for animal production, as well as the opportunities and limitations of breeding strategies for the improvement of animal production under the given ecological and economic conditions is highlighted and discussed. Possibilities to reduce the negative impact of environmental factors on animal production through adapted management strategies are analyzed. Animal nutrition 50% and breeding 50%.
Objectives	Students are able - to describe the effects of abiotic and biotic environmental influences on behaviour and physiology of different livestock species and to discuss appropriate adaptation strategies of animals; - to analyse the opportunities and limitations of adapted feeding, management and breeding for an optimization of livestock production under specific agro-ecological settings; - to individually explain and discuss such topics for a selected livestock species or breed in an oral seminar presentation.
Literature	Payne; W.J.A., Wilson, R.T. 1999: An Introduction to Animal Husbandry in the Tropics. Blackwell Science Ltd., Oxford, UK; Van Soest, P.J. 1994: Nutritional Ecology of the Ruminant. Cornell University Press, Ithaca, US; Wiener, G. 1994: Animal Breeding (Tropical Agriculturist). Macmillan Education, Edinburgh, UK [ISBN-13: 978-0333572986].

Study system usability	Economy	Organic	Tropical
	-	M	M

Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences

Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project
Duration [h]	50	10				

Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x				

Grade composition	75% written test or oral test, 25% oral seminar presentation or homework

A11 Tropical Animal Husbandry Systems

Module	**Tropical Animal Husbandry Systems**							
Code	**A11**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. E. Schlecht, Dr. A. Schiborra							
Contents	This module provides an extensive overview on the different forms of animal husbandry systems in developing and transformation countries of Africa, Asia and Latin America, ranging from camel nomadism in deserts to beef ranching and intensive dairying in tropical highlands. The system-specific strategies of livestock management are analysed in view of their ecological and economic sustainability. The (potential) interactions of livestock with other components of the farming system are explored, thereby differentiating between market and subsistence oriented systems. The role of additional factors influencing livestock production systems such as cultural, social, economical and political frame conditions are discussed.							
Objectives	Students are able - to understand the impact of the natural and economic environment on the evolution of different types of husbandry systems as well as on their orientation and intensity of production; - to gain understanding for parameters that have to be considered when aiming at improvement of livestock husbandry systems within a given framework; - to individually analyse and present a specific tropical livestock production system.							
Literature	Delgado, C., Rosegrant, M., Steinfeld, H., Ehui, S., Courbois, C. 1999: Livestock to 2020. The next food revolution. FAO Discussion Paper 28, FAO Rome, Italy; Devendra, C., Thomas, D., Jabbar, M.A. and Zerbini, E., 2000: Improvement of Livestock Production in Crop-Animal Systems in Agro-ecological Zones of South Asia. ILRI, Nairobi, Kenya; Falvey, L., Chantalakhana, C. (eds) 1999: Smallholder Dairying in the Tropics. ILRI, Nairobi, Kenya.							
Study system usability	Economy			Organic			Tropical	
	E			E			C	
Entrance requirements	Basic knowledge (B.Sc. level) of plant and animal sciences or agricultural economics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [h]	50		10					
Examination type	Oral test	Written test	Homework	Sem. seech		Protocol	Work report	Proj. report	Proj. pres.
		x		x					
Grade composition	75% written test, 25% oral seminar presentation							

A12M Multidisciplinary Research in Tropical Production Systems

Module	**Multidisciplinary Research in Tropical Production Systems**							
Code	**A12M**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Participants	Maximum 25							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. E. Schlecht, Dr. A. Schiborra							
Contents	This module prepares the student for international agricultural research in the framework of their M.Sc. and Ph.D. theses, the prerequisites of which include the ability to work in a multicultural and interdisciplinary environment as well as the ability to communicate scientific results effectively and efficiently. The module emphasises the practice of research and presentation skills. Participatory tools for field research are introduced and tested, group exercises on how to design experiments and analyse experimental data are carried out. Hereby, the livestock, crop and farm household data is taken from finalized or ongoing research projects of the instructors. The communication of the results in the form of scientific posters is trained.							
Objectives	- To learn priority setting for research projects, formulation of problem statement, research objectives and hypotheses - To get acquainted with participatory tools for field research - To learn how to design experiments and analyse field data - To learn how to present research results as a poster at a conference							
Literature	Specific methodological publications and scientific articles, distributed in the course.							
Study system usability	Economy			Organic			Tropical	
	E			M			M	
Entrance requirements	Basic computer skills and compulsory module in statistics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [h]	20						40	
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
		x				x			x
Grade composition	50% written test, 25% tool execution and discussion, 25% poster compilation and presentation							

A13M Livestock-based sustainable land use

Module	**Livestock-based sustainable land use**							
Code	**A13M**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. E. Schlecht, Dr. A. Schiborra, Dr. K. Brinkmann							
Contents	This module highlights the general positive and negative impacts of livestock and livestock management on the natural resources (air, water, soil vegetation) and specifically under (sub)tropical conditions, at the plot to the watershed scale. It discusses options for sustainable livestock-based land use, thereby building upon the beneficial impacts of animals on soils and plants. Management options for reducing negative environmental effects of livestock (gaseous emissions, nutrient excretion) are highlighted, and possibilities for consolidating the interests of livestock keepers with international conventions are discussed. The students are introduced, in lectures, own reading and practical field tests, to up-to date quantitative and qualitative methods that are used in studies on animal-environment interactions. Simple modelling approaches that depict animal-environment interactions at the plot up to the watershed scale are presented and tested by the participants.							
Objectives	- To understand the interactions of livestock with the natural resource base and their site- and management specific positive or negative environmental impacts - To get acquainted with and test methodological approaches used in field research on livestock-environment interactions - To learn about simple modelling approaches and the significance of heir results							
Literature	Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M., de Haan, C. 2006: Livestock's long shadow. Fao, Rome, Italy; Specific scientific articles, distributed in the course.							
Study system usability	Economy			Organic		Tropical		
	-			M		M		
Entrance requirements	Basic knowledge (B.Sc. level) of soil, plant and animal sciences							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [h]	40				20			
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

E01 World Agricultural Markets and Trade

Module	**World Agricultural Markets and Trade**							
Code	**E01**							
Coordinator	**Prof. Dr. B. Brümmer**							
Language	English							
Stud. Workload	180h (84h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. B. Brümmer							
Contents	This module deals with the situation in the world agricultural markets and with the intervention of agricultural and trade policy in these markets based on an introduction into basics of the international trade theory. The students are able to discern populistic arguments against free-trade. They can estimate if there are reasons to deviate from the from the postulate of free-trade in matters of agricultural products, e.g. in order to reward the positive external effects of the agriculture, to ensure the food supply, to fend off dumping or to correct distorted world prices for agricultural products.							
Objectives	Theoretical foundations of international trade: Ricardo, Heckscher-Ohlin-Viner; Empirical tests for different trade theories; imperfect competition in international trade; gravity theory; institutions and organisations on world agricultural markets; agricultural trade liberalisation at the multilateral (WTO) and bilateral level; specific policy measures in agricultural trade.							
Literature	Feenstra, R.C. 2004: Advanced international trade: Theory and evidence. Princeton University Press.							
Study system usability	Economy			Organic			Tropical	
	C			E			E	
Entrance requirements	Basic knowledge of agricultural economics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	56						28	
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x								
Grade composition	100% oral test							

E02 Agricultural Price Theory

Module	**Agricultural Price Theory**							
Code	**E02**							
Coordinator	**Prof. Dr. B. Brümmer**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	Prof. Dr. B. Brümmer							
Contents	This module is designed to provide students with an introduction to the theory and measurement of price formation on agricultural markets. Students will learn about price formation and price linkages over space and time, and how prices on markets in different locations and/or for products of different levels of processing are linked with one another. They will also learn about special examples of price determination that are unique (land markets) or especially common (markets influenced by quota schemes) in agriculture. A final focus will be placed on future markets and their possible use as a risk management tool in agriculture and agribusiness.							
Objectives	Significance of prices from individual and societal viewpoint, agricultural price structure, role of technical change, vertical and spatial price formation, price formation in quota markets, futures and forward contracts.							
Literature	A script and a variety of supplemental readings will be provided							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Background in agricultural markets and policy recommended							
Instruction type	Lecture		Seminar		Excursion	Practice	Tutorial	Project
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

E03 Ecological economics

Module	**Ecological Economics**							
Code	**E03**							
Coordinator	**Prof. Dr. B. Knerr**							
Language	English							
Stud. workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS / SS)	SS							
Instructors	Prof. Dr. B. Knerr, NN							
Contents	- theoretical background - societal and philosophical backgrounds - environmental implications of economic growth - discussion of current problems with focus on agriculture							
Objectives	Students are able to assess, evaluate and present the environmental implications of economic activities, the rationales behind them and possible ways to resolve perceived problems.							
Literature	Faber M. 1999: Ecological Economics, Springer							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Background in agricultural economics and policy							
Instruction type	Lecture		Seminar		Excursion	Practice	Tutorial	Project
Duration [contact h]	30		30					
Examination type	Oral test	Written test	Homework	Presentation	Protocoll	Work report	Proj. report	Proj. pres.
	X		X	X				
Grade composition	30% oral test, 50% homework, 20% presentation							

E04 Changing societies, intercultural management

Module	**Changing societies, intercultural management**							
Code	**E04**							
Coordinator	**Prof. Dr. W. Troßbach**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	NN, Prof. Dr. W. Trossbach							
Contents	1. Intercultural management: Culture and cultural patterns; Processes of cross-cultural adaptation; Intercultural communication and dialogue; Leadership and personality in intercultural contexts; Management of change; Working with conflict and resistance. 2. Changing societies: Patterns of change in western history; The Agricultural Revolution; Intertwining reforms of the nineteenth century: social and agrarian; History of the Organic Movement; Food supply and changing nutrition habits in history. A systematic survey of agents and patterns of change in history is to be combined with a detailed view on the development of European agriculture and food supply, beginning with the history of the early Agricultural Revolution in England.							
Objectives	Students should become acquainted with the history of agricultural systems and nutritional habits, in order to adequately evaluate and influence the role of (organic) agriculture in the process of accelerated change, characteristic of contemporary western societies. Students are able to successfully perform in contexts where intercultural communication, co-operation and management are in demand. Based on their knowledge about the history of agricultural systems and nutritional habits they are able to adequately evaluate and influence the role of (organic) agriculture in the process of accelerated change, characteristic of contemporary western societies.							
Literature	Augsburger, I.D.W. 1992: Conflict Mediation Across Cultures. Louisville; Bennett, M. J. (ed.) 1998: Basic Concepts of Intercultural Communication. London; Hodgetts R. M., Luthans F. 2000: International Management. Culture, Strategy and Behavior. Boston; Huntington S. 1996: The Clash of Civilizations. New York; Harris P.R., Moran R. T. 1991: Managing Cultural Differences. Houston; Hall E. T. 1976: Beyond Culture. New York; Overton M. 1996: Agricultural Revolution in England. The Transformation of the Agrarian Economy 1500 – 1850. Cambridge; Conford P. 2001: The Origins of the Organic Movement. Edinburgh; Thirsk J. 1978: Economic Policy and Projects. The Development of a Consumer Society in Early Modern England, Oxford							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	none							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]			60					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
			X	X				
Grade composition	100% homework or oral seminar presentation							

E05M Marketing Research

Module	**Marketing Research**							
Code	**E05M**							
Coordinator	**Prof. Dr. U. Hamm**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. U. Hamm							
Contents	Tasks and management of marketing research; methods of data collection; methods of data analysis, methods of prognoses.							
Objectives	Students (i) are able to outline the steps in the marketing research process; (ii) are able to develop a marketing research design; (iii) know all relevant methods for data collection, analyses and prognoses with their specific advantages and problems; (iv) acquire personal skills for teamwork, oral and written presentations.							
Literature	Aaker, D.A., Kumar, V., Day, G.S. 2004: Marketing research, 8th ed., John Wiley, New York; Bryman, A. 2004: Social research methods, 2nd ed. Oxford University Press; Shao, A.T. 2002: Marketing research 2nd ed., South-Western Thomson Learning, Cincinatti.							
Study system usability	Economy			Organic			Tropical	
	M			M			E	
Entrance requirements	Basic knowledge on marketing							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30		30					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x		x	x					
Grade composition	50% oral test, 25% written seminar presentation, 25% oral seminar presentation							

E06 International markets and marketing for organic products

Module	**International markets and marketing for organic products**							
Code	**E06**							
Coordinator	**Prof. Dr. U. Hamm**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. U. Hamm, Dr. J. Aschemann, M.Sc. U. Gilles							
Contents	Analysis of international markets and trade for organic products; import regulations of the EU; marketing strategies and instruments for the export of organic products; case studies for the export of organic products from developing countries to the EU; design of a business plan.							
Objectives	Students are able (i) to analyse international market statistics; (ii) to describe the modes of functioning of EU import regulations for organic products; (iii) to define the necessary steps to collect and analyse market data of export markets; (iv) to develop a marketing concept for the export of organic products; (v) to elaborate written and oral presentations in teamwork.							
Literature	Jain, S.C. 2001: International marketing, 6th ed., South Western Thomson Learning, Cincinatti; Kotler, P., Keller, K.L. 2006: Marketing management, 12th ed., Pearson Prentice Hall, Upper Saddle River; Schmid, O., Hamm, U., Richter, T., Dahlke, A. 2004: A guide to successful organic marketing initiatives. Research Institute of Organic Agriculture, Frick/Switzerland; Wilson, R.M.S., Gilligan, C. 2003: Strategic marketing management, 2nd ed., Elsevier Amsterdam.							
Study system usability	Economy			Organic			Tropical	
	E			M			E	
Entrance requirements	Basic knowledge on marketing							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30		30					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x		x	x					
Grade composition	50% oral test, 25% written presentation, 25% oral presentation							

E08M Econometrics I

Module	**Econometrics I**							
Code	**E08M**							
Coordinator	**Prof. Dr. S. Sperlich**							
Language	English							
Stud. Workload	180h (84h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. S. Sperlich, Prof. Dr. S. von Cramon Taubadel, Prof. Dr. B. Brümmer							
Contents	Multiple linear regression model: Estimation, inference and asymptotics; Binary respectively dummy variables; Heteroskedasticity (GLS estimator, tests and related topics); Time Series Analysis; Panel-Data; Misspecification and data problems (functional form misspecification, specification tests, measurement error, model selection); IV Methods (including simultaneous equation models); Binary Response Models (Logit and Probit)							
Objectives	This lecture provides a detailed introduction to and discussion of the theory of several topics of econometrics. In a practical course the students will apply the methods discussed to real economic data and problems using the statistical software package STATA.							
Literature	Wooldridge, J. 2006: Introductory Econometrics: A Modern Approach. South-Western; Greene, W. 2003: Econometric Analysis, Prentice Hall; Hackl, P. 2005: Einführung in die Ökonometrie, Pearson Studium; Stock, J., Watson, M. 2007: Introduction to Econometrics, Pearson Education; Baltagi, B. 2002: Econometrics, Springer-Verlag, Berlin; Judge, G., Hill, R., Griffiths, W., Lütkepohl, H. 1988: Introduction to the Theory and Practice of Econometrics, New York: Wiley; Von Auer, L. 2005 (1999): Ökonometrie. Eine Einführung (2. Auflage), Springer-Verlag, Berlin.							
Study system usability	Economy			Organic			Tropical	
	M			-			-	
Entrance requirements	Mathematics (linear algebra), statistics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28					28	28 (optional)	
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

E09 International Forest and Environmental Policy

Module	**International Forest and Environmental Policy**							
Code	**E09**							
Coordinator	**Prof. Dr. M. Krott**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. M. Krott, Dr. C. Hubo, NN.							
Contents	Forest Development Policy: The objective is that students get basic knowledge of the forest policy process in developing countries and of strategies for cooperation and development. Forest development policy is shown by specific programs, institutions, stakeholders and informational, financial and regulative instruments. The strategies for development focus on the forest resources and the social as well as economic resources in tropical developing countries. The national and international institutions and activities for securing sustainable forestry are discussed and analyzed in various case studies. Global Environmental Policy: The objective is that the students get advanced knowledge of both the global environmental policy and the application of the policy analysis on such issues. The programs of global environmental policy, especially the multilateral environmental agreements, are presented and an overview is given over the key international institutions and stakeholders. The informational, regulative and economic instruments for global environmental policies are discussed using case studies. Analysis by Social sciences: The objective is that the students get an overview over the specific methodology of applied social sciences in the political and social system of developing countries. Additionally the students get some practice in specific methods of empirical-analytical field research in developing countries. The content comprises the basic scientific paradigms in social sciences and the different methods. Selected methods are applied to case studies of forestry in developing countries.							
Objectives	Students understand the backgrounds and relations of forest and environmental policy at international level and are familiar the methods in applied social sciences. In particular they know the international key policies for forest and environment as well as their implications for social and political processes at national and local level, especially in developing countries.							
Literature	Baylis, J., Smith, S. (eds) 2001: The Globalization of World Politics. An introduction to international relations, 2. ed., Oxford University Press: New York; Bryman, A. 2001: Social Research Methods, Oxford University Press: New York; German Advisory Council on Global Change [WBGU] 2000: World in Transition. New Structures for Global Environmental Policy, Earthscan: London; Humphreys, D. 2006: Logjam. Deforestation and the crisis of global governance, Earthscan: London.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Basic knowledge in policy							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28		28				voluntary	
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x					
Grade composition	50% written or oral test, 50% oral presentation with written outline or homework							

E10 Economics of Biological Diversity in the Tropics and Subtropics

Module	**Economics of Biological Diversity in the Tropics and Subtropics**							
Code	**E10**							
Coordinator	**Prof. Dr. R. Marggraf**							
Language	English							
Stud. Workload	90 (+90; second partial module as an extension of a fully satisfactory [3.7] seminar paper of the first partial module)							
Credits	3 (+3)							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. R. Marggraf, Dr. J. Barkmann							
Contents	Socio-economic importance of biological diversity, its endangerment and protection at the genetic, species and ecosystem level; design of analytic strategies for the economic quantification of biodiversity importance, application to exemplary cases.							
Objectives	Students learn to (i) address a valuation problem that is of particular interest to them. They (ii) learn to independently acquire knowledge on a scientific topic from primary literature and (iii) to make sound judgments on the basis of incomplete information in order to come to defendable economic valuations. Students (iv) learn to communicate an issue, methods, results and conclusions to a scientific audience according to the current state of international research in writing. They (v) get to know the rules of good scientific practice.							
Literature	no *a priori* prescribed literature							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Introductory course in micro-, agricultural or welfare economics							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]	15		15					(30)
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
			x				x	x
Grade composition	30% paper preparation, 50% final seminar paper, 20% sustained contributions to seminar; Second partial module: 100% extended seminar paper.							

E11 Socioeconomics of Rural Development and Food Security

Module	**Socioeconomics of Rural Development and Food Security**							
Code	**E11**							
Coordinator	**Prof. Dr. M. Qaim**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	Prof. Dr. M. Qaim							
Contents	This module provides students with an overview of socioeconomic aspects of hunger and poverty in developing countries. Apart from more conceptual issues and development theories, policy strategies for rural development and poverty alleviation are discussed and analyzed. Special emphasis is put on problems in the small farm sector. Numerous empirical examples are used to illustrate the main topics.							
Objectives	Students learn concepts of development and problem-oriented thinking in a development policy context. The identification of interdisciplinary linkages is trained. Building on problem analyses within concrete examples, course participants can pinpoint appropriate economic and social policies and assess their impacts. These qualifications can also be transferred to unfamiliar situations.							
Literature	Text books, research articles, and lecture notes							
Study system usability	Economy			Organic			Tropical	
	C			M			M	
Entrance requirements	Prior knowledge of microeconomics at the BSc level is useful.							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x							
Grade composition	100% oral test							

E12M Quantitative Research Methods in Rural Development Economics

Module	**Quantitative Research Methods in Rural Development Economics**							
Code	**E12M**							
Coordinator	**Prof. Dr. M. Qaim**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Dr. H.Seebens, Prof. Dr. M.Qaim							
Contents	This module teaches and trains methodological skills for the analysis of micro data in development economics. In particular, farm and household level data are used. Apart from statistical and econometric techniques, approaches of primary data collection are covered (questionnaire development, survey sampling design). These methods are used for concrete examples in the computer lab. Moreover, students develop their own short research proposal.							
Objectives	Students are familiar with empirical, quantitative methods in development economics. Thus, they are able to develop and implement their own research projects.							
Literature	Text books, research articles, and lecture notes							
Study system usability	Economy			Organic		Tropical		
	M			E		E		
Entrance requirements	Contents of the lecture: Socioeconomics of Rural Development and Food Security							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	40				16			
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x					x	
Grade composition	50% written test, 50% project report							

E13M Microeconomic Theory and Quantitative Methods of Agricultural Production

Module	**Microeconomic Theory and Quantitative Methods of Agricultural Production**							
Code	**E13M**							
Coordinator	Prof. Dr. M. Qaim or Prof. Dr. Olman Quiros							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Part module 1	Microeconomic Theory of Agricultural Production							
Instructor 1	Prof. Dr. M. Qaim							
Contents 1	Consumer theory, producer theory, markets, monopoly situations, risk and uncertainty, economics of technical change, farm household models, sharecropping contracts.							
Objectives 1	Students are familiar with microeconomic approaches and can apply them to analyze issues related to agriculture and rural development.							
Literature 1	Text books, research articles, and lecture notes							
Part module 2	Quantitative Methods in Agricultural Business Economics							
Instructor 2	Prof. Dr. O. Mußhoff							
Contents 2	Budgeting, accounting, annual balance sheets, linear programming, finance, investment analysis							
Objectives 2	Students are familiar with quantitative methods used for the analysis and planning of farms and enterprises in the agricultural sector.							
Literature 2	Text books, research articles, and lecture notes							
Study system usability	Economy			Organic		Tropical		
	M			E		E		
Entrance requirements	Basic knowledge in agricultural economics							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj .report	Proj. pres.
		x						
Grade composition	100% written test							

E14 Evaluation of Rural Development Projects and Policies

Module	**Evaluation of Rural Development Projects and Policies**							
Code	**E14**							
Coordinator	**Prof. Dr. M. Qaim**							
Language	English							
Stud. Workload	180h (56h) contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Dr. S. Schwarze, Prof. Dr. M. Qaim							
Contents	This module teaches and trains the standard methods for the evaluation of rural development projects and policies. In particular, this includes impact assessment as well as cost-benefit analysis. These methods are used for concrete project and policy examples.							
Objectives	Students know the major methods for the evaluation of rural development projects and policies. They apply these methods for concrete project examples and thus are able to design and carry out evaluations independently.							
Literature	Text books, research articles, and lecture notes							
Study system usability	Economy			Organic			Tropical	
	M			M			E	
Entrance requirements	Knowledge of the content of the module "Socioeconomics of Rural Development and Food Security" is required.							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30							26
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj.report	Proj. pres.
		x							x
Grade composition	50% written test, 50% project presentation							

E15 Strategic Management and Operations

Module	**Strategic Management and Operations**							
Code	**E15**							
Coordinator	**Prof. Dr. S. Seuring**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Part module 1	Strategic Management							
Instructor 1	Prof. Dr. S. Seuring							
Contents 1	- Strategic Management Process - Market-based view - Resource-based view - Integration and diversification							
Objectives 1	Students are able to: - Describe the strategic management process - Distinguish different concepts of strategic management - Apply related concepts to practical examples							
Literature 1	Barney, J.B., Hesterley, W. 2008: Strategic Management and Competitive Advantage – Concepts and Cases, 2nd edition, Pearson Prentice Hall, Upper Saddle River.							
Part module 2	Strategic Operations Management							
Instructor 2	Prof. Dr. S. Seuring							
Contents 2	- Strategic Decision in Operations Management - Performance Objectives - Product-process-matrix - Decoupling point and postponement - Sourcing - Logistics management - Production planning - Distribution							
Objectives 2	Students are able to: - describe major decisions in operations strategy - know several concepts from operations strategy - apply related concepts to practical examples							
Literature 2	Slack, N., Lewis, M. 2008: Operations Strategy, 2nd edition, Pearson Prentice Hall, Harlow.							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Preferable at least one module on Management related topics, e.g. Management and Management Accounting							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	40		20					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x					
Grade composition	60% oral or written test, 40% oral seminar presentation or written report (homework)							

E16 Supply Chain Management

Module	**Supply Chain Management**							
Code	**E16**							
Coordinator	**Prof. Dr. S. Seuring**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Part module 1	Supply Chain Management							
Instructor 1	Prof. Dr. S. Seuring							
Contents 1	- Introduction to terminology - Supply chain and operations strategy - Supply chain processes - Supplier selection and evaluation - Logistics and distribution management - Supply chain performance							
Objectives 1	Students are able to: - understand the importance of supply chains - describe the processes and related material and information flows in a supply chain - know basic concepts of supply chain management							
Literature 1	Wisner, J.D., Leong, G.K., Tan, K.-C. 2005: Principles of Supply Chain Management – A Balanced Approach, Thompson, Mason; Fawcett, S.E., Ellram, L.M., Ogden, J.A. 2007: Supply Chain Management – From Vision to Implementation, Pearson Prentice Hall, Upper Saddle River.							
Part module 2	Sustainable Supply Chain Management							
Instructor 2	Prof. Dr. S. Seuring							
Contents 2	- Basics of sustainable development and sustainability management - Strategies for sustainable supply chain management - Environmental and social standards - Green processes in the supply chain - Greening products							
Objectives 2	Students are able to: - understand the relevance of sustainability initiatives in supply chain management - distinguish alternative approaches to sustainable supply chain management - apply related concepts to practical examples							
Literature 2	Seuring, S. 2007: Sustainability & Supply Chain Management, University of Lüneburg, Germany.							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Module “Management and Management Accounting” (or similar basic management knowledge) Module “Strategic Management and Operations” (or other additional management related modules)							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	40		20					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x					
Grade composition	60% oral or written test, 40% oral seminar presentation or written report (homework)							

E17M Management and Management Accounting

Modul	**Management and Management Accounting**							
Code	**E17M**							
Coordinator	**Prof. Dr. S, Seuring**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS / SS)	WS							
Part module	Management and Management Accounting							
Instructor	Prof. Dr. S. Seuring							
Contents	- Key concepts and terminology in management - Planning - Organising - Leading - Controlling - Key concepts and terminology in management accounting - Instruments in management accounting - Traditional cost assignment - Activity based costing - Performance management - Management control systems - Management accounting in an international context - Basics of international management							
Objectives	Students are able to - understand the role of management in organisations, - know basic terminology and concepts in management and know about their interrelation - understand the role of management accounting in organisations - know basic terms and concept of management accounting and control - understand concepts of management accounting and performance management - describe challenges of international management							
Literature	Lussier, R.N. 2006: Management fundamentals – Concepts, Applications, Skill Development, Thomson, London, UK; Robbins, S.P., Coulter, M. 2007: Management, 9th edition, Pearson, Upper Saddle River; Drury, C. 2005: Management Accounting for Business, Thomson, London, UK; Atkinson, A.A., Kaplan, R.S., Young, S.M. 2004: Management Accounting, 4th Edition, Upper Saddle River.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	none							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	40		20					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x					
Grade composition	60 % oral or written test, 40% in seminar speech or essay (homework)							

E18 Organization of Food Supply Chains

Module	**Organization of Food Supply Chains**							
Code	**E18**							
Coordinator	**Prof. Dr. L. Theuvsen**							
Language	English							
Stud. Workload	180h (56 h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. L. Theuvsen							
Contents	Organization of food supply chains in the meat sector and other agribusiness subsectors: Transaction cost, theoretic, strategic and behavioral approaches and empirical evidence Transparency of food supply chains Stakeholder management for farms and agribusiness firms Organization structures and business process design in agribusiness firms: Decision-oriented background and practical implications							
Objectives	Students comprehend the theoretical foundations of the organizational design of food supply chains and agribusiness firms. They understand how farms and firms adapt their boundaries, structures and processes to technical and social influences from their internal and external environments. Students are able to identify and classify problems and develop solutions based on the theoretical knowledge acquired in this course.							
Literature	Lecture based materials							
Study system usability	Economy			Organic		Tropical		
	M			E		E		
Entrance requirements	Basic knowledge of supply chain management (B.Sc. level)							
Instruction type	Lecture	Seminar		Excursion	Practice	Tutorial		Project
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. Speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

E19 Market Integration and Price Transmission I

Module	**Market Integration and Price Transmission**							
Code	**E19**							
Coordinator	**Prof. Dr. S. von Cramon-Taubadel**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. S. von Cramon-Taubadel							
Contents	Theory and empirical analysis of agricultural market integration							
Objectives	Students gain insight into the functioning of the price mechanisms on agricultural markets and into the determinants of market integration. They learn to apply econometric analysis methods to the study of horizontal and vertical price transmission processes (time series methods, cointegration, including non-linear cointegration and non-linear error correction models).							
Literature	A list of seminal papers (Garnder, Ravallion, Goodwin, Fackler, Barrett) will be circulated to students, together with a list of recent applications.							
Study system usability	Economy			Organic		Tropical		
	E			-		-		
Entrance requirements	Basic knowledge of econometrics							
Instruction type	Lecture	Seminar		Excursion	Practice	Tutorial		Project
Duration [contact h]	28					28		
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

E20 Agricultural Policy Seminar

Module	**Agricultural Policy Seminar**							
Code	**E20**							
Coordinator	**Prof. Dr. S. von Cramon-Taubadel**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. S. von Cramon-Taubadel, Prof. Dr. B. Brümmer							
Contents	Seminar focus changes every year according to key issues and developments in international agriculture. Agricultural measures in the EU and other countries of interest; national and international agricultural markets (trends, changes etc.).							
Objectives	Students apply economic concepts and methods to selected issues in the field of agricultural policy and agricultural market analysis. By writing and orally presenting a seminar paper the students practise how to carry out literature searches, properly and independently write a scientific paper and improve presentation skills.							
Literature	Appropriate sources and an effective literature search strategy are discussed with each student individually, depending on the topic that he/she will be writing on. Chapters from textbooks provide background material and are supplemented by journal articles and other more detailed studies.							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Introductory economics at the Bachelors level recommended.							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]			60					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj.report	Proj.pres.
			x	x				
Grade composition	50% written paper (homework), 50% oral presentation							

E21 Rural Sociology

Modul	**Rural Sociology**							
Code	**E21**							
Coordinator	**Prof. Dr. U. Liebe**							
Language	English							
Stud. Workload	180h (56 contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. U. Liebe							
Contents	The module introduces a agro-sociological and agro-historical understanding of problems, thereby considering European and global dimensions.							
Objectives	Students get acquainted with the outlines of the most important agrarian ideologies. They understand the situation, the problems and the changes of the agrarian and/or rural population in Europe, the eastern reform states and in the developing countries. Through insight into relevant historical processes they are able to assess today's role of agriculture in a regional and global context.							
Literature	Adequate literature is presented in the lecture; text book chapters supply basic knowledge and are complemented by scientific publications.							
Study system usability	Economy			Organic			Tropical	
	M			M			E	
Entrance requirements	none							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj.report	Proj.pres.
	x	x						
Grade composition	100% oral test or written test							

E22M Research Methods for Business

Module	**Research Methods for Business**								
Code	**E22M**								
Coordinator	**Prof. Dr. Stefan Seuring**								
Language	English								
Stud. Workload	180h (60h contact time)								
Credits	6 ECTS								
Frequency (WS / SS)	Bi-Annually, WS (winter term)								
Instructor	Prof. Dr. Stefan Seuring								
Contents	- Introduction to philosophy of science - Research Process - Data collection and analysis - Case study research - Action research - Content analysis - Expert studies								
Objectives	Students are able to: - understand the relevance of the research process - describe the research processes - know basic techniques of data collection and analysis								
Literature	Saunders, M., Lewis, P., Thornhill, A. 2007: Research Methods for Business Students, 4. Edition, Prentice Hall, Harlow.								
Study system usability	Economy			Organic			Tropical		
	M			E			E		
Entrance requirements	Strategic Management and Operations								
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial		Project
Duration [contact h]	40		20						
Examination type	Oral test	Written test	Homework	Sem. Speech		Protocoll	Work report	Proj. Report	Proj. Pres.
			x	x			x		
Grade composition	100% in class presentation and essay (one unit)								

E23 Global agricultural value chains and developing countries

Module	Global Agricultural Value Chains and Developing Countries							
Code	E23							
Coordinator	Jun.-Prof. Dr. M. Wollni							
Language	English							
Stud. Workload	180 (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	Jun.-Prof. Dr. M. Wollni							
Contents	This lecture deals with the impacts of restructured and globalized agricultural markets on small-scale farmers and traders in developing countries. Current developments and changes on agricultural markets are analyzed and the implications for developing countries discussed. Approaches of the value chain analysis and the promotion of pro-poor value chains are explained. Emphasis will be laid on the roles of institutions for the performance of markets in developing countries, especially against the background of recent developments. Models of contract theory, institutional and transaction costs economics are conveyed and used to analyze the situation in developing countries.							
Objectives	The students will become familiar with the application of these models through empirical examples and the discussion of journal articles.							
Literature	Selected articles from academic journals and book chapters							
Study system usability	Economy		Study system usability		Economy			
	E		E		E			
Entrance requirements								
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj.report	Proj. pres.
		x		x				
Examination type	Students will be graded on the basis of a 45 min written exam, a presentation/short paper, and active participation in classroom discussions							

E24 Topics in Rural Development Economics I

Module	**Topics in Rural Development Economics I**							
Code	**E24**							
Coordinator	Jun.-Prof. Dr. M. Wollni							
Language	English							
Stud. Workload	180 (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Jun.-Prof. Dr. M. Wollni, Prof. Dr. M. Qaim							
Contents	This course will provide Master Students with an overview of relevant topics in rural development economics, which will also enable them to develop own research questions and study approaches in this field. The module is structured as a reading course, building on selected articles from relevant international journals. Students are required to read announced articles before the classroom sessions, in order to enable a critical debate in class. The articles selected for the course are clustered around key topics relevant to rural development economics, such as listed below. Tentative Topics 1. The food system transformation and smallholder farmers 2. Rural livelihood strategies and income diversification 3. Adoption and impact of modern agricultural technology 4. Economics of nutrition and health 5. Gender and intra-household resource allocation							
Objectives	The objective of this course is to acquaint Master students with the reading and understanding of scientific journal articles on relevant topics of rural development economics. Student should learn how to develop a scientific research question, choose appropriate research methods and strucutre a scientific article.							
Literature	Selected articles from academic journals and book chapters							
Study system usability	Economy		Organic		Tropical			
	M		E		E			
Entrance requirements								
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	54h							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
			x		x			
Grade composition	50 % homework assignments and 50% protocoll Attendance is required.							

E25 International forest policy and economics

Modul	**International forest policy and economics**							
Code	**E25**							
Coordinator	Prof. Dr. M. Krott							
Language	English							
Stud. Workload	180 h, 60h Kontakt							
Credits	6							
Frequency (WS/SS)	Jährlich, WS							
Instructor	PD. Dr. M. Krott, Dr. C Hubo, NN							
Contents	Submodule 1: „Global environmental and forest policy“ The objective is that students get basic knowledge of both the key policies related to forests and the application of the policy analysis on such issues. Students acquire comprehension about global forest related policy processes and factual knowledge about forest actors affecting the policy on a global level. The seminar combines a lead-in to global policy theory and its translation in practical, empirical knowledge about actors and processes of high importance in forestry. The different instruments for international policy formulation and implementation are discussed using case studies. Submodule 2: „International forest economics” The lecture is split in two main areas: 'International Wood Markets' and 'International Environmental and Forest Conservation'. The first part deals with the international trade with wood and wood products. International markets and the consequences of protectionism are analysed. Furthermore, aspects of international wood marketing are shown. In the second part, international environmental problems are described and possibilities as well as constraints for international co-operation are discussed. Finally, relations between environmental conservation and economic development are analysed.							
Objectives								
Literature								
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements								
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	28	28						
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	Written examination 100 %							

E26 Development economics 1

Modul	**Development economics 1**							
Code	**E26**							
Coordinator	Prof. Dr. S. Klasen							
Language	English							
Stud. Workload	180 h, 60h Kontakt							
Credits	6							
Frequency (WS/SS)	Jährlich, WS							
Instructor	PD. Dr. S. Klasen							
Contents	This course provides an overview of macro issues in development. It examines the measurement of development, historical roots of underdevelopment, growth, trade, inequality, environmental, and aid issues.							
Objectives								
Literature	Debraj Ray: Development Economics							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Prior knowledge of macroeconomics and econometrics is highly recommended							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x	x	x	x				
Notenzusammensetzung	50% Written or oral exam and 50% assignment and presentation							

E27 Labour mobility, migration and rural development

Module	**Labour mobility, migration and rural development**							
Code	**E27**							
Coordinator	Prof. Dr. B. Knerr							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. B. Knerr and research assistants							
Contents	The course presents theoretical and empirical knowledge about the causes and consequences of labour mobility, with a special view on the context of rural regions. It covers internal mobility (including, e.g., multi-functionality and off-farm work) as well as different forms and dimension of migration, from rural-to-urban up to international, as well as remittances (financial, human capital, social). Causes and consequences are analyzed at the international, national, regional, community and household level.							
Objectives	Students are able (i) to understand the mechanisms which lead to labour mobility at the household, regional and international level as well as its consequences; (ii) to develop policy options which support defined economic objectives; (iii) to write expertises and reports on related topics; (iv) to pursue own research projects in the area.							
Literature	Todaro, M.P. and St. Smith, 2011: Economic Development. FT Prentice Hall; selected journal articles.							
Study system usability	Economy			Organic			Tropical	
	M			E			E	
Entrance requirements	Basic knowledge in economics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30		30					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x	x	x				
Grade composition	50% written test, 40% homework, 10% sem. speech (flexible)							

E28 Regional Modelling

Module	**Regional Modelling**							
Code	**E28**							
Coordinator	Dr. H. Bergmann							
Language	English/German							
Stud. Workload	180h (56 h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Part module 1	Regional Modelling - Theory							
Duration (contact h)	28							
Instructor 1	Dr. Holger Bergmann							
Contents 1	This lecture will teach basic and advanced knowledge on how to analyse regional effects of development instruments and investments							
Objectives 1	This module will teach the students the basic and advance knowledge of secondary data bases.							
Literature 1	Bryden, J.M. et al., 2010. Towards Sustainable Rural Regions in Europe Exploring Inter-relationships between Rural Policies, Farming, Environment, Demographics, Regional Economies and Quality of Life using System Dynamics, London: Routledge.							
Part module 2	Regional Modeling - Practice							
Duration (total h)	28							
Instructor 2	Dr. Holger Bergmann							
Contents 2	In the exercises accompanying the lectures, students will practice the basics of modelling with a number of examples.							
Objectives 2	Students will gain knowledge and experience in static as well as in system dynamic regional modelling							
Literature 2	Bryden, J.M. et al., 2010. Towards Sustainable Rural Regions in Europe Exploring Inter-relationships between Rural Policies, Farming, Environment, Demographics, Regional Economies and Quality of Life using System Dynamics, London: Routledge.							
Study system usability	Economy			Organic			Tropical	
	E							
Entrance requirements	Basic knowledge of regional economics and regional statistical data bases							
Instruction type	Lecture	Seminar		Excursion	Practice		Tutorial	Project
Duration [contact h]	28				28			
Examination type	Oral test	Written test	Home-work	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x	X	X				
Grade composition	40 % written test, 30% home work, 30% seminar speech							

I01M Ecological Modelling and GIS

Module	**Ecological Modelling and GIS**								
Code	**I01M**								
Coordinator	**Dr. T. Fricke**								
Language	English								
Stud. Workload	180h (60h contact time)								
Credits	6 ECTS								
Frequency (WS/SS)	WS								
Instructors	Dr. T. Fricke, NN								
Contents	Ecological modeling: Introduction to common mathematical concepts used in ecology; basic steps of modelling (conceptual modelling, translation of ecological knowledge into mathematical concepts, implementation, verification; concepts of simulation, specific methods (nonlinear parameter estimation, sensitvity analysis); introduction to modelling and simulation packages; modelling of important ecological processes: Transport, nutrient cycles, dynamics of soilwater, growth, population dynamics. GIS (**G**eographical **I**nformation **S**ystems): Principles of geodetics; georeferencing; data types, -import and -management; methods of data manipulation and analysis (aggregation, (re)classification, interpolation, buffers, overlays, network analysis, image analysis; remote sensing techniques; practical exercises with GIS and GPS, explained under consideration of applications in (organic) farm management and precision farming.								
Objectives	Ecological Modelling: Basic understanding of the mathematics used in ecological modelling (e.g. ordinary and partial differential equations, state and time events, including numerical aspects); basic experiences in modelling and simulation; knowledge about the possibilities and limits of modelling and simulation in ecology. GIS: Understanding of geodetic fundamentals, basic GIS-methods and related applications like GPS, remote sensing and precision farming; evaluation of GIS-applications in (organic) farm management.								
Literature	Lecture notes, online tutorials								
Category	Economy			Organic			Tropical		
	E			M			M		
Entrance requirements	Basic knowledge in ecology, mathematics and computer science								
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial		Project
Duration [contact h]	60								
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x		x						
Grade composition	50% oral test, 50% homework								

I02 Management of (sub-)tropical landuse systems

Module	**Management of (sub-)tropical landuse systems**							
Code	**I02**							
Coordinator	**Prof. Dr. A. Bürkert**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS (in alternation with INT07 every 2nd year at the University of Agriculture in Prague, Czech Republic)							
Instructors	Prof. Dr. A. Bürkert, Prof. Dr. E. Schlecht, Prof. B. Havrland, Dr. V. Krepl, Dr. J. Banout , Dr. V. Verner, Dr. Z. Polesny							
Contents	Kassel: Plant-animal interactions, diet selection and nutritional wisdom, impact of grazing on pastures; statistical approaches to measure and cope with short-distance variability in crop growth; measurement techniques for nutrient fluxes in different agro-ecosystems. Prague: Land-use management: farm and family income in different farming systems, soil conservation technologies for smallholder farming systems, conservation tillage systems, potential use of waste-stream products to enhance soil productivity in tropical peri-urban and rural areas, crop diversity in tropical agricultural systems.							
Objectives	Enable students to understand the functioning and bio-physical limitations of (subtropical agro-pastoral land use systems, to argue for the need of interdisciplinary approaches to overcome these and to apply current research methods in land use systems analysis.							
Literature	Altieri, M. 1995: Agroecology, Westview Press, USA; Martius, C. 2002: Managing Organic Matter in Tropical Soils: Scope and Limitations. Kluwer Academic Publishers; Van Soest, P. 1994: Nutritional ecology of the ruminant. Cornell University Press, London, UK; Provenza, F.D. 1995: Post-ingestive feedback as an elementary determinant of food preference and intake in ruminants. Journal of Range Management, 48: 2-17.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Knowledge in plant, soil and animal sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	56							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

I03 Food quality and organic food processing

Module	**Food quality and organic food processing**							
Code	**I03**							
Coordinator	**Prof. Dr. A. Ploeger**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	PD Dr. J. Kahl, Dr. N. Busscher							
Contents	- European and international legislation for organically produced agricultural commodities (focussing : Annex II, Annex VI EEC 2092/91; contracting, quality standards, product handling) - Quality standard setting and the Organic Guarantee System - Certification systems for organic and conventional products (overview, principles, concept, certification) - Accreditation and accreditation agencies - Process and product orientated food quality concepts and assessments; “holistic” quality definitions - Processing techniques for organic food processing (different product groups) - Quality assessment methods for small and medium-size enterprises							
Objectives	Students will be able to - define food quality and quality systems in agriculture and food industry - discuss principles of organic food production (agriculture, processing) according to EEC 2092/91) - discuss and evaluate food processing techniques and quality assessment methods							
Literature	Florkowski et al. 2000: Integrated View of Fruit and Vegetable Quality, Technomic; Welti-Chanes et al. 2001: International Congress on Engineering and Food, Volume I and II, Technomic; Luning et al. 2002: Food quality management, Wageningen Pers; Lawless et al. 1999: Sensory evaluation of Food, Kluwer; Kent et al.1994: Technology of cereals, Pergamon; Bidlack et al. 2000: Phytochemicals as bioactive agents, Technomic; Linden et al. 1994: New ingredients in food processing, CRC; Souci et al. 2000: Nutrition Tables, Medpharm.							
Study system usability	Economy			Organic			Tropical	
	E			M			E	
Entrance requirements	Basic knowlegde in chemistry							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	60							
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
				x				x	
Grade composition	50% seminar speech (oral presentation), 50% project work							

I06M Exercise on the quality of tropical and subtropical products

Module	**Exercise on the quality of tropical and subtropical products**							
Code	**I06M**							
Coordinator	**Prof. Dr. E. Pawelzik**							
Language	English							
Stud. Workload	180h (40h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. E. Pawelzik, N.N.							
Contents	Exercises on quality properties of wheat, rice, potatoes, fruits and vegetables: Starch and protein quality of baking wheat; dough and baking properties of wheat, sensors of baking goods, rheological properties of rice flour and other starch containing products, cooking and frying properties of potatoes; consumer acceptance of potatoes; Marketing properties of fruits and vegetables; texture, ripeness, inner quality properties of fruit and vegetable (e.g. sugar/acid ratio, nitrate in leaf vegetable), sensors of fruit and vegetable juices.							
Objectives	Students are able (i) to analyze and discuss experimental data considering economics and consumer expectations, (ii) to work with scientific primary literature, (iii) to elaborate written presentations in teamwork, (iv) to exchange their opinions about sensorial evaluation.							
Literature	Belitz, Grosch, Schieberle 2004: Food Chemistry, 3rd rev. ed., Springer Berlin.							
Study system usability	Economy			Organic			Tropical	
	-			E			M	
Entrance requirements	Basic knowledge on agriculture production and chemistry							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]					40			
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
					x			
Grade composition	80% protocol, 20% preparedness and activity during lab work							

I07 International Land Use Systems Research – an Interdisciplinary Study Tour

Module	**International Land Use Systems Research – an Interdisciplinary Study Tour**							
Code	**I07**							
Coordinator	**Prof. Dr. E. Schlecht**							
Language	English							
Participants	Maximum 20							
Stud. Workload	180h (124h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS, once in 2 years, alternating with Module INT02							
Instructors	Prof. Dr. E. Schlecht, Prof. Dr. A. Bürkert, Dr. C. Hülsebusch, Prof. Dr. A. Dohrenbusch, NN							
Contents	Through the combination of one semester of preparatory impulse lectures and student seminars and the 12-14 day excursion to a (sub)tropical country, this module provides participants with interdisciplinary insights into the bio-physical and socio-economic components of agro-silvo-pastoral systems in the global context. The small- to large-size farm enterprises, processing plants and marketing organisations to be visited during the excursion exemplify the opportunities and challenges of agricultural activities in their specific context, whereby particular attention is paid to aspects of sustainability and environmental safety. The excursion targets regions where the two universities conduct research programmes, and also includes visits to partner universities and (inter)national research institutions. This will allow the MSc students to gain a first impression of how field research is organized and carried out in (sub)tropical countries. Up-to-date research approaches are presented to the participants and questions targeting the sustainable use of natural resources as well as questions of development cooperation are discussed in an international and interdisciplinary context.							
Objectives	- To gain multi- and interdisciplinary insight into (international) approaches towards opportunities and challenges of agro-silvo-pastoral production systems, sustainable resource use and agricultural development interventions - To familiarize participants with theoretical and practical questions of field research in an international context							
Literature	Specific general and scientific articles dealing with the excursion country, distributed in the course.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Study focus on international agriculture and development policy							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [h]	4		20	100				
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x			x	x			
Grade composition	50% oral exam, 30% oral seminar presentation, 20% excursion day-protocol							

I08 Organic farming under European conditions

Module	**Organic farming under European conditions**							
Code	**I08**							
Coordinator	**Prof. Dr. P. von Fragstein**							
Language	English							
Stud. Workload	180 hours (80h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. P. von Fragstein							
Part module 1	Ecological Agriculture in Europe							
Contents 1	Presentation and discussion of selected literature							
Part module 2	Prototyping of farming systems							
Contents 2	Definition of farming systems, multifunctional objectives. Methods for testing and improving the set of objectives.							
Part module 3	International standards of organic farming							
Contents 3	Comparison of standards of organic agriculture (IFOAM, EU, AGOEL)							
Objectives	Students understand and are able to evaluate farming systems and their underlying multifunctional objectives. Students are able to discuss and judge standards of organic agriculture.							
Study system usability	Economy			Organic			Tropical	
	E			M			E	
Entrance requirements	Basic knowledge in soil and plant sciences							
Literature	Lecture based materials							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]	20		40					20
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x			x			x	x
Grade composition	50% oral exam +50% oral seminar presentation or 70% project report + 30% project presentation							

I09 Sustainable Nutrition

Module	**Sustainable Nutrition**							
Code	**I09**							
Coordinator	**Prof. Dr. A. Ploeger**							
Language	English							
Stud. Workload	180h (68h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. A. Ploeger, NN							
Contents	Analysis of international food systems and food consumption patterns; the role of food for human health, environment and social parameters; instruments to measure the influence of different food systems on natural resources; case studies for sustainable food systems.							
Objectives	Students are able to (i) describe the role of nutrition for human health and a sustainable development; (ii) describe the influence of nutrition (from farm to fork) on environmental parameters (soil, water, atmosphere, biodiversity); (iii) understand tools to measure food habits; (iv) understand tools to measure “sustainability” in nutrition regimes; (v) are able to write and give oral presentations in a team.							
Literature	Will be provided via the system2teach platform							
Study system usability	Economy			Organic			Tropical	
	E			M			E	
Entrance requirements	Basic knowledge on biochemistry, statistics and environmental issues							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]			60	8				
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
			x	x				
Grade composition	50% homework, 50% seminar speech.							

I10M Applied statistical modelling

Modul	**Applied statistical modelling**							
Code	**I10M**							
Coordinator	**Prof. Dr. S. König**							
Language	English							
Stud. Workload	180h (84 Contact hours)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. S. König and staff							
Contents	Statistical analysis in the agricultural sciences are based primarily on the use of linear models rer. They cover a wide range of applications concerning the distribution of the data and model assumptions, and ultimately allow the simultaneous estimation of fixed and random effects in mixed-th models. The understanding and application of mixed linear model implies detailed knowledge of matrix algebra, which will begin the course. The students are at the beginning of the course put in a position to formulate statistical models. Furthermore, the who-teaches the basics of programming in R, which is used for homework exercises used. Different types of linear models are built up gradually and learn how regression models, classification models, and finally mixed models with fixed and random effects. Other questions focus on multicollinearity, model selection criteria and the same model experiments, the corrected estimate mean values and the testing of hypotheses. Linear models are developed for generalized linear mixed models with link function for categorical distributed data or data that follow a Poisson distribution (count variable). Similarly, knowledge about non-parametric test procedures are taught. A variety of examples and exercises to deepen the theory learned permanently. Students are motivated on the basis of sample data sets to work on problems independently. This module generates a substantial understanding and basic knowledge about statistical Datenanalyse, which can be used for future scientific work in the context of master's or doctoral theses.							
Objective	The aim of the course is to make students familiar with the basic concepts of 'linear models', the 'Generalized linear models' and 'non-parametric estimation procedures', which now belong to the standard methods in applied statistics. Furthermore, the practical application of the methods are taught using the statistical software package R.							
Literature	Lecture notes Searle S. R. (1982) Matrix Algebra Useful for Statistics, Wiley Series in Probability and Statistics. Mrode R. A. (2005) Linear Models for the Prediction of Animal Breeding Values, CABI Publishing. Dobson A. & Barnett A. (2008) An Introduction to Generalized Linear Models, Chapman & Hall. Wood S. (2006) http://www.amazon.co.uk/Generalized-Additive-Models-Introduction-R/dp/1584884746/ref=sr_1_6?ie=UTF8&s=books&qid=1228725710&sr=1-6Generalized Additive Models: An Introduction with R , Chapman & Hall..							
Study system usability	Economy			Organic			Tropical	
	-			P			P	
Entrance requirements	Mathematics (linear algebra), Statistics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28					28	28 (optional)	
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj.report	Proj.pres.
		x	X						
Grade composition	50% written test, 50% Home work							

I11M Free project

Module	**Free project**							
Code	**I11M**							
Coordinator	**Prof. Dr. von Cramon-Taubadel, Prof. Dr. von Fragstein, Prof. Dr. Bürkert**							
Language	English							
Stud. workload	180h (contact time variable)							
Credits	6 Credits							
Frequency (WS/SS)	WS and SS							
Instructor	All instructors of the programme are possible							
Contents	a) A topic for a project is chosen in agreement with the instructor. The aim of the project is to gain profound scientific knowledge on the chosen topic. This can include experimental work. b) The result of the project can be a written thesis, an oral presentation and/ or an electronically secured result.							
Objectives	Students are able to plan and carry out a scientific project. This includes critical evaluation of publications and the ability to apply gained knowledge on problems in the field or in economic or scial sciences. Students are also able to present results and discuss them on the basis of their knowledge.							
Literature	Scientific publications on the topic agreed upon with the instructor.							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Written agreement with instructor on topic, form and time frame for the project.							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]								60
Examination type	Oral test	Written test	Homework	Presentation		Protocol	Work report	Oral test	Written test
				x			x		
Grade composition	100% project work report (oral presentation on individual arrangement)							

I12 Sustainable International Agriculture: basic principles and approaches

Modul	**Sustainable International Agriculture: basic principles and approaches**							
Code	**I12**							
Coordinator	**Prof. Dr. Eva Schlecht**							
Language	English							
Stud. Workload	180 h, (56 h Contact hours)							
Credits	6 ECTS							
Semester (WS / SS)	WS							
Instructor	Dr. J. Barkmann, Prof. A. Bürkert, Prof. Dr. U. Liebe, Prof. Dr. B. Ludwig, Prof. Dr. D. Möller, Prof. Dr. E. Schlecht							
Contents	Global change, ranging from population growth, migration and urbanization on climate change, land degradation and water shortages are major challenges for the sustainable use of natural resources and human capital and produce an order must be globally all deal with agricultural production employed actors to continue the ensure adequate provision of both quantity and quality of food. This module therefore addresses the basic concepts and principles of sustainability and sustainable agriculture in their ecological, economic and social dimensions. Methodological approaches to gathering and assessing biophysical and socio-economic sustainability of a land use system and agricultural value chains will be discussed. Opportunities for sustainable management of water, soil, plants and animals, as well as agricultural products along the value chains are discussed, thereby providing the relevant temporal and spatial scale levels considered							
Objectives	The student: - Are able to characterize the most important bio-physical and socio-economic factors that shape agricultural production systems and resource use strategies. - Know relevant ecological, economic and social indicators for sustainability - Can be integrated process for the use of indicators for monitoring the sustainability of a system to explain and apply them to examples.							
Literature	Lecture notes and articles / publications are handed out at events. Bell, S. & Morse, S., 2003. Measuring sustainability: learning by doing; Earthscan, London, UK. Bell, S. & Morse, S., 2008. Sustainability indicators: measuring the immeasurable? Earthscan, London, UK.							
Study system usability	Economy			Organic			Tropical	
	C			C			C	
Entrance requirements	Basic (BSc level) of Agricultural sciences							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Durationr [contakt h]	46		10					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj.report	Proj.pres.
	x		x	x				
Grade composition	Technical discussion and presentation with homework (written summary of presentation)							

P01 Ecology and Agroecosystems

Module	**Ecology and Agroecosystems**							
Code	**P01**							
Coordinator	**Prof. Dr. A. Bürkert**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. A. Bürkert, Dr. U. Niggli							
Contents	Case-study based analysis and discussion of ecological framework conditions (limitations) in different arid and sub-humid agro-ecosystems of tropical and temperate zones with a particular focus on marginal soils and/or difficult infrastructural conditions where effective nutrient cycling, integration of cropping and animal husbandry systems as well as the use of biodiversity for income generation at the farm level is of particular importance. The potential/role of organic agriculture will be discussed and a more general discussion of the potential of organic agriculture to strengthen the resilience of agro-ecosystems will be presented.							
Objectives	Students are able to define site-specific conditions of sustainability, identify key constraints to the productivity and sustainable use of agro-ecosystems, assess the scope of human (management) interventions, determine the causes of productivity decline and chose approaches to strengthen sustainability							
Literature	Altieri, M. 1987: Agroecology: the scientific basis of alternative agriculture. Westview Press, Boulder, Colorado, USA; Gliessman, S.R. 1998: Agroecology: ecological processes in sustainable agriculture. Ann Arbor Press, Michigan, USA.							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Basic knowledge in plant, soil and animal science, willingness to analyse agro-ecosystems quantitatively							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	50		10					
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj.report	Proj.pres.
	x			x					
Grade composition	60% oral test, 40% oral presentation							

P02 Energetic and technical use of agricultural crops

Module	**Energetic and technical use of agricultural crops**							
Code	**P02**							
Coordinator	**Prof. Dr. M. Wachendorf**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Part module 1	Energetic use of agricultural crops							
Instructor 1	Prof. Dr. M. Wachendorf							
Contents 1	Management of agricultural crops for energetic use. Energy scenario and potentials, emission of greenhouse gases, sources of energy from biomass and waste material, selecting and processing biomass as a fuel. Biogas, fermentation process and plant technology. Vegetable oil, biodiesel. Processing of alcohol esters from triglycerides and free-fatty-acids. Ethanol fermentation process, distillation and dehydration, thermo-chemical processes. Gasification, Fischer-Tropsch-Process.							
Objectives 1	Based on the data presented, students are able to identify and calculate potentials and limits of energy production from renewable plant resources.							
Literature 1	Klass, D. 1998: Biomass for Renewable Energy, Fuels, and Chemicals, Academic Press; Sims, R. 2002: The Brilliance of Bioenergy. James & James, London, UK; Rosillo-Calle, F. 2007: The Biomass Assessment Handbook. Earthscan; London, UK.							
Part module 2	Technical use of agricultural crops							
Instructor 2	PD Dr. M. Karpenstein-Machan							
Contents 2	Management of agricultural crops for technical use. Technologies of processing biomasses to produce technical raw materials (fibres, colours, proteins, lipids, etc.). Benefits and restrictions by the replacement of fossil fuel-based materials through biomass-based products.							
Objectives 2	Based on the data presented, students are able to identify and calculate potentials and limits of raw material production from renewable plant resources.							
Literature 2	Will be provided via E-learning platform during the module							
Study system usability	Economy			Organic			Tropical	
	E			E			E	
Entrance requirements	Basic knowlege in soi land plant sciences, physics and chemistry							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	50			10				
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x								
Grade composition	100% oral test							

P03 Ecological soil microbiology

Module	**Ecological soil microbiology**							
Code	**P03**							
Coordinator	**Dr. M. Schenck**							
Language	English							
Stud. workload	180h (60h contact time)							
Credits	6 ECTS							
Frequenz (WS/SS)	WS							
Instructors	Dr. M. Schenck, Prof. Dr. R.G. Jörgensen							
Contents	Introduction toand application of important up-to-date methods in soil-microbiology to determine the activity, biomass and community structure of soil- microorganisms. The complete operational sequence of a research project is simulated: (1) sampling, (2) sample preparation, (3) measurements and data collection (application of methods), (4) data processing, (5) statistics and (6) drafting a manuscript. Up-to-date literature is presented and discussed by the students.							
Objectives	Students learn to use microbiological methods and to interpret the obtained data. Students develop a consciousness for the complexity of soil fertility and soil quality and see the difficulties in diagnosing it.							
Literature	Coyne, M.S. 1999: Soil microbiology: an exploratory approach. Thomson Press; Paul, E.A., Clark, F.E. 1996: Soil microbiology and biochemistry. 2nd ed. New York Academic Press; papers to be presented in the course are provided.							
Study system usability	Economy			Organic			Tropical	
	-			M			E	
Entrance requirements	Basic knowledge in biology, chemistry, and soil sciences. To do an experimental Master's thesis in soil sciences or plant nutrition this module is compulsory.							
Instruction type	Lecture		Seminar		Excursion	Practice	Tutorial	Project
Duration [contact h]	8		8		4	40		
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
							x		x
Grade composition	100% written work report (prerequisite: successful project presentation)							

P04 Plant nutrition in the tropics and subtropics

Module	**Plant nutrition in the tropics and subtropics**							
Code	**P04**							
Coordinator	**Dr. B. Steingrobe**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. W. Horst, Prof. Dr. M. Schenk, Dr. B. Steingrobe							
Contents	Aspects of plant nutrition in humid, subhumid and arid tropics; cropping systems and their influence on soil fertility; fertilization of lowland rice.							
Objectives	Students are able to find solutions for specific problems of tropical plant nutrition. They learn to prepare and present a scientific oral presentation.							
Literature	will be given during the lecture							
Study system usability	Economy			Organic			Tropical	
	-			-			M	
Entrance requirements	Baisc knowledge in soil and plant sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	28		28					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x			x				
Grade composition	70% oral test, 30% oral seminar presentation							

P05 Organic cropping systems under temperate and (sub)tropical conditions

Module	**Organic cropping systems under temperate and (sub)tropical conditions**							
Code	**P05**							
Coordinator	**Prof. Dr. P von Fragstein**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. P. von Fragstein, Prof. Dr. A. Bürkert							
Contents	Visits of organic farms; case studies of livestock-oriented organic farming under different environmental conditions and constraints; development, evaluation and comparison of land use management systems under diverse natural, economic and socio-cultural conditions; nutrient cycling in plant-animal systems; site-specific contributions of legumes to N supply; P availability, P recycling and use of rock phosphates; modes of P supply in farming systems; EC, Australian, Japanese and North American regulations for organic farming – problems and opportunities.							
Objectives	Students are able to describe the principles and functions of agro-ecosystems, understand nutrient cycles and options for their improvement as an important basis of organic farming, evaluate systems of land use with a particular focus on organic modes of production and their role in agro-ecosystems, assess the role of livestock for nutrient cycling and with respect to conservation of plant and animal biodiversity in (sub-)tropical settings.							
Literature	Altieri, M. 1987: Agroecology: the scientific basis of alternative agriculture. Westview Press, Boulder, Colorado, USA; Willer, H. et al. 2008: The World of Organic Agriculture - Statistics and Emerging Trends 2008, IFOAM, Bonn, Germany.							
Study system usability	Economy			Organic			Tropical	
	E			C			M	
Entrance requirements	Basic knowledge in plant, soil and animal sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	40		10	10				
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x			x				
Grade composition	60% oral test, 40% seminar speech (oral presentation)							

P06 Soil and water

Module	**Soil and water**							
Code	**P06**							
Coordinator	**Prof. Dr. R.G. Joergensen**							
Language	English							
Stud. workload	180 hours (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. R.G. Joergensen, Prof. Dr. O. Hensel, NN							
Contents	- Soil quality, processes and functions (Org. matter turnover, interactions between soil organisms, soil fertility) - Soil degradation and conservation (erosion, acidification, compaction, contamination), soil and water salinity - Water management (basics of water ecology and landscape water household, evaluation and development of waters) in national and international context - Water lifting and conveyance, surface irrigation, sprinklers, micro-irrigation							
Objectives	Students are able to critically evaluate soil and water problems and the limits of natural resources.							
Literature	Wild, A. 1993: Soils and the Environment. Cambridge University Press; Achtnich, W. 1998: Bewässerungslandbau. Ulmer Verlag, Germany; Coyne, M.S. 1999: Soil microbiology: an exploratory approach. Thomson Press; Paul, E.A., Clark, F.E. 1996: Soil microbiology and biochemistry. 2nd ed. New York Academic Press; Lampert, W. 1997: Limnoecology. Oxford University Press; Naiman, R.J. (ed.) 1998: River Ecology and Management. Springer; Wetzel, R.G. 1983: Limnology. Saunders College Publishing.							
Study system usability	Economy			Organic			Tropical	
	-			M			E	
Entrance requirements	Module Soil and plant science or equivalent, Fundamentals on water ecology and management							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	50			10				
Examination type	Oral test	Written test	Homework	Presentation	Protocol	Work report	Proj. report	Proj. pres.
	x							
Grade composition	100% oral test							

P07 Soil and plant science

Module	Soil and plant science							
Code	P07							
Coordinator	Prof. Dr. M.R. Finckh							
Language	English							
Stud. workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. A. Bürkert, Prof. Dr. M.R. Finckh, Dr. H. Saucke							
Contents	Influence of soil formation processes on physical properties (soil type, soil water, Po-renraum), chem. Properties (buffering capacity, exchange capacity, nutrients) and biol. Properties (organic matter, edaphon). Nutrient availability and nutrient mobilization under conventional and organic cropping conditions, major and trace nutrients and food quality. Breeding objectives for different agricultural systems: plant morphology, genetics and breeding, and use plat domestication, characterization and assessment and exploitation of genetic resources in plant breeding. Genetics of host-parasite interactions, epidemiology of plant diseases, Pflanzenabwehrme mechanisms, insect physiology and ecology.							
Objectives	Bridge module to the latest knowledge in the horticultural basic subjects in particular with regard to issues of ecological agriculture, which are usually not taught to teach. Students who have attended this course can follow the further agronomic modules.							
Literature	Brady, N.C. (1990): The nature and properties of soils. 10th edition. H. Marschner (1995): Mineral Nutrition of Higher Plants, Academic Press, New York. P. Sanchez (1976): Properties and Management of Soils of the Tropics, Wiley, New York. van Wyk, B.-E. (2005): Food Plants of the World. Briza Publication, Pretoria. Rehm, S. and G. Espig (1991): The Cultivated Plants of the Tropics and Subtropics. Verlag Josef Margraf, Weikersheim. Agrios, G.N. (2005): Plant Pathology, 5th edition. Pedigo, L.P. (2002): Entomology and Pest Management, 4th edition.							
Study system usability	Economy			Organic			Tropical	
	-			C bridging module			C bridging module	
Entrance requirements	none							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [contact h]	50		10					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x	x						
Grade composition	100 % oral or written test							

P08 Pests and Diseases of Tropical Crops

Module	**Pests and Diseases of Tropical Crops**							
Code	**P08**							
Coordinator	**Prof. Dr. S. Vidal**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Contents	Students should become familiar with the - causes of diseases (abiotic & biotic diseases) - taxonomy of disease agents (bacteria, fungi, virus) and insect pests - basics of integrated pest management (approaches, economic threshold, epidemiology) - biological control (diseases, pests) - cultural control (cultivars, crop rotation, planting term, manual control) - chemical control (toxicology, fungicides, insecticides) of the main crops in subtropical and tropical regions							
Objectives	Gain an understanding of potential control options in tropical and subtropical crops via an integrated crop management approach.							
Literature	Lecture based materials; details provided during lectures.							
Study system usability	Economy		Organic		Tropical			
	-		E		M			
Entrance requirements	Basic knowledge (B.Sc. level) in agricultural entomology, plant diseases and plant production							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	45	15						
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x		x				
Grade composition	70% written test, 30% seminar speech							

P09 Biological Control and Biodiversity

Module	**Biological Control and Biodiversity**							
Code	**P09**							
Coordinator	**Prof. Dr. S. Vidal**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructor	Prof. Dr. S. Vidal, Prof. Dr. T. Tscharntke							
Contents	- Theoretical foundations of biological control - Natural enemy behaviour and biological control success - Biodiversity and ecosystem services in agroecosystems - Practical examples of biological control projects - Plant-herbivore-predator-interactions - Principles of population dynamics - Biological weed control							
Objectives	Gain an understanding of what biological control is and how it can be used effectively as part of an IPM system and how biodiversity contributes to control of pest populations and other ecosystem services.							
Literature	Lecture based materials; details provided during lectures.							
Study system usability	Economy		Organic		Tropical			
	-		M		E			
Entrance requirements	Basic knowledge (B.Sc. level) in entomology, ecology and plant production							
Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project		
Duration [contact h]	30	14		16				
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x		x				
Grade composition	70% written test, 30% seminar speech							

P10 Tropical Agro-Ecosystem Functions

Module	**Tropical Agro-Ecosystem Functions**							
Code	**P10**							
Coordinator	**Dr. R. F. Kühne**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Dr. R. F. Kühne							
Contents	Introduction to and overview of agronomy-based land use systems in the tropics and subtropics taking into account ecological points of view. Analysis of the sustainability of plant production under special consideration of the physical, chemical and biological soil quality as well as the efficient water use in the seasonal tropics.							
Objectives	Knowledge of the processes of soil degradation as well as of the measures for their control or prevention in selected land use systems of the tropics and subtropics; knowledge of ecological system functions and their synthesis in agronomic concepts for the adaptation to unfavourable climatic and pedological conditions in the tropics and subtropics.							
Literature	Lecture notes and handouts, selected chapters from textbooks; copies of PowerPoint presentations							
Study system usability	Economy			Organic			Tropical	
	-			E			M	
Entrance requirements	Basic knowledge (B.Sc. level) of soil and plant sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	50		6					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj.pres.
	x			x				
Grade composition	50% sem. speech, 50% oral test							

P11 Forest growth, disturbance and mangement in the tropics

Module	**Forest growth, disturbance and mangement in the tropics**							
Code	**P11**							
Coordinator	**PD Dr. M. Worbes**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Dr. L. Schwendenmann, PD Dr. M. Worbes							
Contents	Ecological and specific basics on forest growth and disturbance dynamics of tropical forests. Phenology, wood anatomy, dendrochronology, reaction and adaptation to common and specific climate events. Natural dynamics of individuals, species populations and communities, reactions on disturbance and global change, carbon cycling and sequestration and sustainable management systems.							
Objectives	Students are able to understand (i) dynamical processes in tropical forests; (ii) causes and consequences of global climate change and global carbon cycle; (iii) the climatic, ecological and economical frame conditions of sustainable forest management; (iv) and are able to perform written and oral presentations.							
Literature	Lecture notes with further literature							
Study system usability	Economy			Organic			Tropical	
	-			E			E	
Entrance requirements	Basics in ecology and silviculture in the tropics							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30		30					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x		x					
Grade composition	50% written test, 50% homework							

P12 Crops and production systems in the tropics

Module	**Crops and production systems in the tropics**							
Code	**P12**							
Coordinator	**PD Dr. M. Worbes**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Dr. R. F. Kühne, PD Dr. M. Worbes							
Contents	Presentation of the most important crops with respect to: botany, morphology, origin, climatic and ecological requirements. Crop production, harvest significance in local farming systems, utilisation as food, feed, raw materials and as bioenergy source. Discussion of specific cropping systems in the tropics and subtropics und specific management systems for the sustainable improvement of productivity.							
Objectives	Knowledge of botanical, ecological and economical facts of crops and cropping systems. The students should be able to classify crops and cropping systems in relation to site conditions and undertake system-orientated evaluation of sustainable production.							
Literature	Rehm, S., Espig, G. 1991: The Cultivated Plants of the Tropics and Subtropics. Verlag Josef Margraf. Weikersheim, Germany; lecture notes							
Study system usability	Economy			Organic			Tropical	
	E			E			C	
Entrance requirements	Basic knowledge on plant production (BSc-level)							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	60							
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x						
Grade composition	100% written test							

P13 Agrobiodiversity and plant genetic resources in the Tropics

Module	**Agrobiodiversity and plant genetic resources in the Tropics**							
Code	**P13**							
Coordinator	**Prof. Dr. A. Bürkert**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. M. Finckh, Prof. Dr. A. Bürkert							
Contents	Case-study based analysis of the role of biodiversity for selected crops in different agro-ecosystems from the arid to the humid climate zones; importance of biodiversity for the stability / sustainability of smallholder (subsistence) *versus* commodity-oriented commercial agriculture in the Tropics, assessment and utilization of diversity, principles and practices in conservation of genetic resources, role of homegardens and indigenous wild fruit trees for *in situ* conservation of biodiversity, causes and consequences of genetic erosion, approaches of germplasm collection.							
Objectives	Students are able to understand the role of agrobiodiversity in tropical agro-ecosystems, to present approaches of functional biodiversity analysis and to discuss the needs and strategies of on-farm (*in situ*) and off-farm conservation of plant genetic resources.							
Literature	Altieri, M. 1987: Agroecology: the scientific basis of alternative agriculture. Westview Press, Boulder, Colorado, USA; Eyzaguirre, P.B., Linares, O.F. 2004: Home gardens and agrobiodiversity. Smithsonia Books, Washington, USA; Wood, D., Lenne, J.M. 1999: Agrobiodiversity: Characterization, utilization and management. CABI Publishing, Wallingford, UK.							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Basic knowledge in plant and soil sciences							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	50		10					
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x			x				

Grade composition	60% oral test, 40% seminar speech

P14M Plant breeding methodology and genetic resources

Module	**Plant breeding methodology and genetic resources**							
Code	**P14M**							
Coordinator	**Prof. Dr. H.C. Becker**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	Prof. Dr. H.C. Becker, Prof. Dr. W. Link							
Contents	Principles of breeding methodology: Response to selection, breeding methods for clonal, line, hybrid and population cultivars. Marker assisted selection for monogenic and polygenic traits. Use of plant genetic resources: wild species, *ex-situ* and *in-situ* conservation, on-farm management. Breeding for marginal environments, demonstrated with examples from temperate and tropical regions.							
Objectives	Students learn the integration of classical and molecular approaches to solve present problems in plant breeding. Social aspects have to be considered. Students learn in own presentations to draw critical conclusions from recent research papers and to communicate these to other students.							
Literature	Lecture based material							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Basic knowledge (B.Sc. level) in genetics and plant breeding							
Instruction type	Lecture	Seminar		Excursion	Practice		Tutorial	Project
Duration [contact h]	44	12						
Examination type	Oral test	Written test	Homework	Presentation	Protocol	Work report	Proj. report	Proj. pres.
		x		x				
Grade composition	70% written test, 30% presentation							

P15M Methods and advances in plant protection

Module	**Methods and advances in plant protection**							
Code	**P15M**							
Coordinator	**Prof. Dr. M. R. Finckh**							
Language	English							
Stud. workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. M. Finckh, Dr. H.Saucke							
Contents	- Advanced course in plant pathology and entomology - Methodology and evaluation methods in plant protection - Case studies of specific plant protection issues in organic farming in the form of lectures, seminars and practical courses							
Objectives	Students are able to critically evaluate published results and apply this knowledge to actual problems in the field. They are also able to deal with problems in the field: Identification and measurements, design of experimental and analytical approaches to problems.							
Literature	Agrios, G.N. 2005: Plant Pathology, 5th edition Academic Press, New York; Pedigo, L.P. 2002: Entomology and Pest Management, 4th edition, Macmillen Pub Co.							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Introductory course in plant protection (entomology and pathology, at least 6 ECTS or equivalent) or bridging module Soil and Plant Science							
Instruction type	Lecture	Seminar		Excursion	Practice		Tutorial	Project
Duration (contact h)	30			10	20			
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
	x	x		x		x		
Grade composition	70% written or oral test, 30% work reports or seminar speech							

P16M Crop and land use modelling

Module	**Crop and land use modelling**							
Code	**P16M**							
Coordinator	**Dr. R. F. Kühne**							
Language	English							
Stud. Workload	180 h (56 h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Dr. R. F. Kühne							
Contents	Overview on important modelling concepts of crop growth and development. Introduction to mathematical, statistical and process-oriented modelling approaches of plant growth. Extension of basic approaches to develop interfaces for plot- and landscape based modelling of soil-plant-systems. Exercises in work groups on the use of DSSAT and CERES-MAIZE software with the computing facilities of the institute.							
Objectives	Teamwork based and independent development, reporting, presentation and discussion of a simulation experiment depicting selected problems from climate change, land-use planning, agro-ecological zoning, or optimization of input factor productivity.							
Literature	Lecture notes and handouts, selected chapters from textbooks, software manuals.							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Basic knowledge (B.Sc. level) of soil and plant sciences, computer literacy							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	23		3			30		
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
				x			x		
Grade composition	50% sem. speech, 50% work report							

P17M Nutrient dynamics: long-term experiments and modelling

Module	**Nutrient dynamics: long-term experiments and modelling**							
Code	**P17M**							
Coordinator	**Prof. Dr. B. Ludwig**							
Language	English							
Stud. Workload	180h (60h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	WS							
Instructors	Prof. Dr. B. Ludwig, Dr. M. Helfrich							
Contents	- - Explanation of the dynamics of C, N and P in arable soils - - Presentation of the results of existing long-term experiments with emphasis on the variables and variants influencing these results - - Modelling of the turnover of soil organic matter and soil nitrogen using the models "Rothamsted Carbon Model" and "DNDC" - - Simulation of pH buffering and nutrient transport in soils using the model "PHREEQC"							
Objectives	Students are able to use established models and to critically evaluate the underlying ecological processes. Based on their understanding of soil nutrient dynamics they are able to evaluate and critically assess the significance of long-term experiments and considering all influencing variables.							
Literature	Blume H.-P. et al. 2002: Lehrbuch der Bodenkunde, 15. Auflage, Spektrum, Heidelberg; Merbach, W. et al. 2000: The long-term fertilization experiments in Halle (Saale), Germany - introduction and surveys. Journal of Soil Science and Plant Nutrition 163. 629-638; Coleman, K., Jenkinson, D.S 1996: RothC-26.3 - A model for the turnover of carbon in soil. In: Powlson, D.S., Smith, P., Smith J.U. (eds.): Evaluation of soil organic matter models. Springer, Berlin; Li, C. 1996: The DNDC model. In: Powlson, D.S., Smith, P. Smith, J.U. (eds.) 1996: Evaluation of Soil Organic Matter Models. Springer, Berlin							
Study system usability	Economy			Organic			Tropical	
	-			M			M	
Entrance requirements	Basic knowledge (B.Sc. level) of soil and plant sciences							
Instruction type	Lecture		Seminar		Excursion	Practice	Tutorial	Project
Duration [contact h]	40					20		
Examination type	Oral test	Written test	Homework	Sem. speech		Protocol	Work report	Proj. report	Proj. pres.
	x								
Grade composition	100% oral test								

P18M Ecopedology of the Tropics and Subtropics

Module	**Ecopedology of the Tropics and Subtropics**							
Code	**P18M**							
Coordinator	**Prof. Dr. E. Veldkamp**							
Language	English							
Stud. Workload	180h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructor	Prof. Dr. E. Veldkamp							
Contents	Basic knowledge of most important aspects of tropical and subtropical soils, their functions, genesis, geography and characteristics. Following themes are discussed: climate, water and vegetation; weathering and clay minerals, soil chemical reactions, soil organic matter, C and N dynamics; soil forming processes and development of soils; regional soil science: tropical shield areas, dry shield areas and plateaus; tropical mountain areas, sedimentary basins in the tropics.							
Objectives	Students acquire knowledge on most important aspects related to tropical and subtropical soils, their occurrence, their characteristics, their genesis and use. They will be able to do independent scientific analysis of soil chemical data and will be able to perform soil descriptions and evaluations in the tropics and subtropics.							
Literature	Veldkamp, E.: Lecture Notes on Ecopedology of the Tropics and Subtropics. Download at: http://ufbwa9.uni-forst.gwdg.de/Veldkamp/Ecopedology%20Tropics%20Lecture%20Notes/ World Reference Base for soil resources 2006. FAO; World Soil Resources Reports 103							
Study system usability	Economy			Organic			Tropical	
	-			-			M	
Entrance requirements	Basic knowledge in soil science							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	30					26		
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
		x				x		
Grade composition	60% written test, 40% report of field practical							

P19M Plant propagation techniques and ecophysiology in the tropics

Module	**Plant propagation techniques and ecophysiology in the tropics**							
Code	**P19M**							
Coordinator	**PD Dr. M. Worbes**							
Language	English							
Stud. Workload	180 h (56h contact time)							
Credits	6 ECTS							
Frequency (WS/SS)	SS							
Instructors	PD Dr. M. Worbes, Dr. R. F. Kühne							
Contents	Basics of and practical exercises on vegetative and generative multiplication techniques in the greenhouse of the department, introduction to statistical experimental design and analyses of greenhouse experiments, theory and practise of ecophsyiological measurements of water status as well as gas change/photosynthesis rates of tropical crop plants.							
Objectives	Knowledge of the botanical, ecological and agronomic facts of the introduced crop plants and multiplication techniques, scientifically correct interpretation and discussion of results from a greenhouse experiment, limitations and potentials of the interpretation of measuring procedures for the description of physiological state variables in tropical crop plants.							
Literature	Copies of PowerPoint presentations, selected chapters from textbooks							
Study system usability	Economy			Organic			Tropical	
	-			E			M	
Entrance requirements	Basic knowledge (B.Sc. level) of plant sciences; pass in the module “Crops and production systems in the tropics”							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [contact h]	12		4			40		
Examination type	Oral test	Written test	Homework	Sem. speech	Protocol	Work report	Proj. report	Proj. pres.
				x		x		
Grade composition	50% seminar speech, 50% work report							

2. Modules at the University of Talca

a) Module list

Students who complete a double degree from the Georg-August University Göttingen (in the context of SIA) and the Universidad de Talca (UTalca), Chile in semester one and semester two at the following UTalca modules, as in the SIA optional or elective modules are recognized:

UT-C-11 Managerial Economics
UT-C-12 Marketing in Agribusiness I (Strategic Marketing)
UT-O-13 Strategic Management
UT-O-14 Agricultural Price Theory (Talca)
UT-O-15 Technologies in Fruit and Wine Production
UT-O-16 Development Economics in Latin America
UT-C-21M Methods for Socio-Economic Analysis (M)
UT-C-22 Financial Management I
UT-O-23 Human Resources Management
UT-O-24M Marketing in Agribusiness II (Marketing Research) (M)
UT-O-25 Principles, Monitoring and Methods of Agricultural Projects Development Policies
UT-O-26 Agricultural Innovation and Extension

b) Module Description

UT-C-11 Managerial Economics

Module	**Managerial Economics**											
Code	**UT-C-11**											
Coordinator	Prof. Dr. Javier L. Troncoso											
Language	English											
Stud. Workload	180h (84 Contact hours)											
Credits	6 ECTS											
Semester	First Semester											
Instructor	Prof. Dr. Javier L. Troncoso Prof. Dr. Alejandra Engler											
Content	This module deals with the theoretical foundations for Economic and management decisions. First, the principles are examined, which are a rational basis for management (Chapters 1-4). Then operational decisions (Chapters 5-8) methods are examined. Even if these principles are applicable, it is Heavy duty on companies in the agribusiness examined in particular. The module is based on lectures, reading material and exercises. The content contains: rational decision theory, demand theory, production theory, cost analysis and supply in different market structures and pricing. Investment decisions and decisions on production mix, transportation choices and control.											
Objectives	- Learning the principles that support a rational decision-making within the company. - Introducing the concepts of microeconomics, focusing on the theory of the firm											
Literature	Mansfield, E., Allen, W.B., Doherty, N. and Weigelt, K. 2002. Managerial Economics. Fifth Edition, W.W. Norton and Co., New York, U.S.A. Samuelson, William, Marks, Stephen. 1999. Managerial Economics. Third Edition, The Dryden Press, Fort Worth, U.S.A.											
Work sytem usability	Economy			Organic			Tropical					
	M											
Entrance requirements	Admission to MIA Program											
Instruction type	Lecture		Seminar		Excursion		Practice		Tutorial		Project	
Duration [Contact h]	54								30			
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll		Work report		Proj.work		Proj.pres
		x										
Grade Composition	Written exams (2): 50%											

UT-C-12 Marketing in Agribusiness I (Strategic Marketing)

Module	**Marketing in Agribusiness I (Strategic Marketing)**
Code	**UT-C-12**
Coordinator	Prof. Dr. Marcos Mora González
Language	English/Spanish (Literature withEnglish and Spanish)
Stud. Workload	180h (84 Contact hours)
Credits	6 ECTS
Semester	First Semester
Instructor	Prof. Dr. Marcos Mora González
Content	• The consumer and agricultural products • The theories of consumer behavior • The psychology of the consumer • The process of buying decision • Psychological Determinants (participation, motives, attitudes) and social influence variables (media and opinion leaders) on consumer behavior. • Product positioning, situational influences, attitudes and determinants of satisfaction position. • Principles of marketing research and consumer behavior • Methods of measurement, the analysis of attitudes and preferences. • New information technologies and concerns of consumers • Marketing tools, product policy and marketing strategies • Consumer behavior and nutrition • Marketing strategies, concepts • Planning marketing
Objectives	The aim of this module is to convey the most important aspects of consumer brand marketing theory and instruments with regard to agricultural goods.

<table>
<tr><td>Literature</td><td>
Buwer, J.; Li, E.; Red, M. (2002). Segmentation of the Australian wine market using a wine-related lifestyle approach. Journal of Wine Research. Vol. 13. Nº 3, pp. 217-242.
Cateora, P. (1997). Marketing Internacional. Ed. Irwin. 863 pág.
Cattin, P. and Wittink, D. (1982). Commercial use of conjoint analysis: a survey. Journal of Marketing. Vol. 46 (verano), pp. 44-53.
Churchill, G.A.; Suprenant C. (1982). An investigation into the determinants of customer satisfaction. Journal of Marketing Research. Vol. XIX (noviembre), pp. 491-504.
Cramer C.; Jensen C.; Southgate, D. (1997). Agricultural Economics And Agribusiness. Ed. John Wiley & Sons, Inc.
CZINKOTA, M; RONKAINEN, I. (1998). Marketing Internacional. Editorial Mc Graw Hill. 819 pág.
Daniels, J; Radebaugh, L.; Sullivan, D. 2004. Negocios Internacionales: Ambientes y Operaciones. Ed. Pearson – Prentice Hall.
Dodds, W. B.; Monroe, K. B.; Grewal, D. (1991). Effects of price, brand and stores information on buyers' products evaluation. Journal of Marketing Research. Vol. 28 (agosto), pp. 307-319.
Green, P.E. and Srinivasan, V. (1990). Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice. Journal of Marketing. Vol. 54. Nº 4, pp. 3-19.
Henson, S. and Northen, J. (2000). Consumer assessment of the safety of beef at the point of purchase: a Pan-European study. Journal of Agricultural Economics. Vol. 51. Nº 1, pp. 90-105.
Horowitz, I & Lockshin, L, (2002), 'What price Quality? An investigation into the prediction of wine-quality ratings', Journal of Wine Research. Vol. 13. Nº1, pp. 7-22.
Kirmani, A.; Rao A. R. (2000). No pain, no gain: A critical review of the literature on signaling unobservable productc quality. Journal of Marketing. Vol. 64 (April), pp. 66-79.
Kotler, P. (2000): Dirección de Marketing. Edición del milenio. Prentice Hall, Madrid.
Kotler, P. y Otros (2000): Introducción al Marketing (2ª ed. Europea). Prentice Hall, Madrid.
Santesmases, M. (1999): Marketing: Conceptos y Estrategias. 4ª Ed. Pirámide, Madrid.
LaBarbera, P.; Mazursky, D. (1983). A longitudinal assessment of consumer satisfaction/dissatisfaction: the dynamic aspect of the cognitive process. Journal of Marketing Research. Vol. 20, pp. 393-404.
Luque T.; Ibañez J.; Barrio S. (2000). Consumer ethnocentrism measurement: an assessment of de reliability and validity of the CETSCALE in Spain. European Journal of Marketing. Vol. 34. Nº 11/12, pp. 1353-1373.
Mora G. M.; Espinoza J.A. (2005). Segments determination of fresh peaches' consumers through the conjoint analysis: an approximation to the Chilean market. Sixth International Peach Symposium. Peach Culture Working Group. ISHS FRUIT SECTION. Santiago (Chile), 9 - 14 January, 2005. Hotel Sheraton. Enviado a Acta Horticulturae.
Mora, M.; Espinoza, J.; Bruna G.; Kern, W.; Marchant, R. (2003). Comercialización de Productos de Origen Agropecuario y Agroindustrial. Programa de Gestión Agropecuaria. Ministerio Agricultura de Chile- Fundación Chile- Universidad de Chile. 76 p.
Ness, M.; Gerhardy, H. (1994). Consumer preferences for quality and freshness attributes of eggs. British Food Journal. Vol. 96. Nº 3, pp. 26-34.
Quester, P., & Smart, J. (1998). The influence of consumption situation and product involvement over consumers' use of product attribute. Journal of consumer marketing. Vol. 15 Nº 3, pp. 220-238.
Rodríguez-Barrio, J. E.; Rivera, L.M.; Olmeda, M. (1990). Gestión Comercial de la Empresa Agroalimentaria. Ed. Mundi-Prensa. Madrid.
Westbrook, R. A. (1987). Product/consumption-based affective responses and postpurchase processes, Journal of Marketing Research. Nº 24, pp. 258-270.
Zeithaml, V. A. (1988). Consumers Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence. Journal of Marketing. Vol. 52 (julio), pp. 2-22.
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<tr><td>Work sytem usability</td><td>
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<tr><td>Economy</td><td>Organic</td><td>Tropical</td></tr>
<tr><td>M</td><td></td><td></td></tr>
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<tr><td>Entrance requirements</td><td>Admission to MIA Program</td></tr>
<tr><td>Instruction type</td><td>
<table>
<tr><td>Lecture</td><td>Seminar</td><td>Excursion</td><td>Practice</td><td>Tutorial</td><td>Project</td></tr>
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<tr><td>Duration [Contact h]</td><td></td></tr>
<tr><td>Examination type</td><td>
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<tr><td>Oral Test</td><td>Written test</td><td>Home work</td><td>Sem. Speech</td><td>Protocoll</td><td>Work report</td><td>Proj.work</td><td>Proj.pres</td></tr>
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<tr><td>Grade Composition</td><td>Written test 30%
Oral test 20%
Seminar and Seminar presentation 50%</td></tr>
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UT-O-13 Strategic Management

Module	**Strategic Management**								
Code	**UT-O-13**								
Coordinator	Prof. M.B.A. Patricio Ortúzar Ruiz								
Language	English/Spanish (Literature with English and Spanish)								
Stud. Workload	180h (84 Contact hours)								
Credits	6 ECTS								
Semester	First Semester								
Instructor	Prof. M.B.A. Patricio Ortúzar Ruiz								
Content	Concepts of Strategy • Tools of strategic management • Analysis of competitive advantage • Corporate strategies in the context of agribusiness • Strategies of Food Industry								
Objectives	– Introduction to the theory of strategy analysis in agribusiness in terms of relevance and applicability – Representation of knowledge about the critical characteristics of companies in the food economy, the markets and the competitive process.								
Literature	Hill, C. & G. Jones (1996): Administración estratégica (3th E), McGraw Hill Johnson, G. & K. Scholes (2002): Dirección Estratégica, ED Prentice Hall Cap 11 Majluf, H.N. (1999): Estrategias para el liderazgo competitivo Dolmen (Kap. 8), Hitt, Ireland & Hoskisson, Ed Thompson Editores Administración Estratégica Porter, M. (1985): Competitive Advantage: Creating and Sustaining Superior Performance, New York, The Free Press Porter, M. (1980): Competitive Strategy. Techniques for Analyzing Industries and Competitors, New York: The Free Press								
Work sytem usability	Economy			Organic			Tropical		
	E								
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial		Project
Duration [Contact h]	54						30		
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
	X	x						X	
Grade Composition	Written test: 50% Oral test: 25% Project work: 25%								

UT-O-14 Agricultural Price Theory (Talca)

Module	**Agricultural Price Theory (Talca)**							
Code	**UT-O-14**							
Coordinator	Prof. Dr. Javier L. Troncoso							
Language	English							
Stud. Workload	180h (56Contact hours)							
Credits	6 ECTS							
Semester	First Semester							
Instructor	Prof. Dr. Javier L. Troncoso Prof. Dr. Alejandra Engler							
Content	Principles of price determination. Price differences and price variability, price institutions. Empirical price analysis. Price determination under perfect competition, price determination under imperfect competition constant (the theory of supply and demand). Empirical applications: Hedonic Pricing, AIDS models, time series analysis and price forecasting, price cycles and seasonality, cointegration models							
Objectives	(i) understanding the complex determinants that influence the level and behavior of agricultural prices (ii) introduction to the empirical price analysis using analytical techniques for price forecasting							
Literature	Tomek, W.G. and Robinson, K.L. , 1972. Agricultural product prices. FAO. 1987. Agricultural price policies. John W. Goodwin. 1994. Agricultural Price Analysis and Forecasting. ISBN: 978-0-471-30447-0							
Work sytem usability	Economy			Organic			Tropical	
	E							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [Contact h]	34		22					28
Examination type	Oral Test	Written test	Home work	Sem. Speech	Protocoll	Work report	Proj.work	Proj.pres
	X			X			X	
Grade Composition	Oral tests (2): 40% Seminar presenatation: 20%							

UT-O-15 Technologies in Fruit and Wine Production

Module	**Technologies in Fruit and Wine Production**
Code	**UT-O-15**
Coordinator	Prof. Dr. José Antonio Yuri Salomon
Language	English/German/Spanish (Literature with English and Spanish)
Stud. Workload	180h (84Contact hours)
Credits	6 ECTS
Semester	First Semester
Instructor	Prof. Dr. José Antonio Yuri S. Prof. Dr. Yerko Moreno S. Prof. Dr. Felipe Laurie G.
Content	Physiology of fruits and plantation management Fruit industry, fruits and fruit, the fruit production costs Harvesting and processing wine The wine industry: Economic and Technical Aspects
Objectives	The aim of the module is to Analyse the physiological and productive aspects of fruit production in temperate and Mediterranean climates. At the same time an overview is given over to wine production and the high quality production of wine.
Literature	**Books** Boulton R.B., V.L. Singleton, L.F. Bisson, and R.E. Kunkee. 1996. Principles and Practices of Winemaking. Chapman and Hall, New York. 604 pp. Faust, M. 1989. Physiology of Temperate Zone Fruit Trees. John Willey & Sons. N. York. 337 Feucht, W. 1967. Fisiología de la Madera Frutal. Pub. en Ciencias Agrícolas Nr. 1. U. de Chile. 64 p. Gil, Gonzalo. Fruticultura. 1997. El Potencial Productivo. Colección en Agricultura. Facultad de Agronomía. P.U. Católica de Chile. 342 p. Gil, Gonzalo.Fruticultura. 2000. La Producción Frutícola. Colección en Agricultura. Facultad de Agronomía. P.U. Católica de Chile. 583 p. Gil, Gonzalo. 2001. Madurez de la Fruta y Manejo de Postcosecha. Colección en Agricultura. Facultad de Agronomía. P.U. Católica de Chile. 413 p. Lawless H.T. and H. Heymann. 1999. Sensory Evaluation of Food. Principles and Practices. Aspen, Maryland. 827 pp. Maib, K.; Andrews, P.; Lang, G. and Mullinix. 1996. Tree Fruit Physiology: Growth and Development. Good Fruit Grower, USA. 165 p. Peterson, B. and Tevens, R. 1994. Tree Fruit Nutrition. Good Fruit Grower, USA. 211 p. Silva. H. y Rodríguez, J. 1998. Fertilización de Huertos Frutales. Colección en Agricultura. Facultad de Agronomía. P.U. Católica de Chile. 519 p. Taiz, , L. and Zeiger, E. 1991. Plant Physiology. The Benjamin/Cummings Pub. Co., Inc., California. 565p Westwood, M.N. 1993. Temperate-Zone Pomology. 3ª Ed. Timber Press, Portland. 523 p. Winter, F.; Janssen, H.; Kennel, W.; Link, H.; Scherr, F. und Silbereisen, R. 1992. Lucas' Anleitung zum Obstbau. 31. ed. Ulmer Verlag, Stuttgart. 415 **Journals** Aconex, Acta Horticulturae, American Journal of Enology and Viticulture. Erwerbsobstbau, Fruticultura Profesional, Good Fruit Growers ,L'Arboriculture Frutiere Obst und Weinbau ,Orchadist of New Zealand, Revista Frutícola (Curicó) Rivista di Frutticoltura e di Ortofloricoltura

Work sytem usability	Economy	Organic	Tropical
	E		

Instruction type	Lecture	Seminar	Excursion	Practice	Tutorial	Project
Duration [Contact h]	52		32			

Examination type	Oral Test	Written test	Home work	Sem. Speech	Protocoll	Work report	Proj.work	Proj.pres
		X						

Grade Composition	Written test: 100%

UT-O-16 Development Economics in Latin America

Module	**Development Economics in Latin America**							
Code	**UT-O-16**							
Coordinator	Prof. Dr. José Díaz Osorio							
Language	English/German/Spanish (Literature with English and Spanish)							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	First Semester							
Instructor	Prof. Dr. José Díaz Osorio							
Content	Introduction: Growth and Development in Latin America – Ananlytical approaches (neo-classical and structuralist approaches) for economic development – Theories of economic development in Latin America – Exports and development of agriculture and natural resources – Strategies of import-substitution industrialization – Ways and in response to the debt crisis – Neoliberal economic resurgence and integration – Current challenges of social change and environmental sustainability							
Objectives	This module combines theory and experience of the historical development in order to understand the various forces that have shaped the economic development in Latin America. Latin America's current economic development is the starting point for discussion. A special emphasis is placed on the indicators for economic growth, volatility of the markets for politics, for income and wealth distribution.							
Literature	Amartya Sen, "Development, which Way Now?" Economic Journal, 93, December 1983: pp. 745-762. Albert Fishlow, "The State of Latin American Economies", in Interamerican Development Bank, Economic and Social Progress in Latin America, 1985, pp. 123-145. Alain de Janvry, " Social Disarticulation in Latin America History," in ed. Kwan Kim and David F. Ruccio, Debt and Development in Latin America, (Notre Dame, Indiana: University of Notre Dame 1985). pp. 32-73. Edward E. Leamer, Hugo Maul, Sergio Rodriguez, and Peter K. Schott, "Does Natural Resource Abundance Increase Latin America Income Inequality", Journal of Development Economics, 59 (1999): 3-42 Michael Todaro, "Trade Strategies: Import Substitution", Chapter 16 in Todaro, Economic Development in the Third World, 4th ed. (New York, Longman, 1989). Rene Villareal. "The Latin American Strategy of Import Substitution: Failure or Paradigm for the Region?", in Manufacturing Miracles, edited by Gary Gerreffi and Donald L. Wyman, (Princeton: Princeton University Press, 1991). CEPAL, Foreign Investment in Latin America and the Caribbean: 1998 Report, (Chile United Nations, 1998): pp 52-59, 99-102, 126, 171-179. Michael Carter and Bradford L. Barham, "Level Playing Fields and Laissez Faire: Post-Liberal Development Strategy in Inegalitarian Agrarian Economies", World Development, 24, 7 (1996): 1133-1149. Chs 2 and 3, Inter-American Development Bank, "Facing up to Inequality in Latin America" (http://www.iadb.org/oce/IPES98_eng/).							
Work sytem usability	Economy			Organic			Tropical	
	E							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [Contact h]	56		14				14	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
				X			X		
Grade Composition	Seminar Presenation: 50% Work report: 50%							

UT-C-21M Methods for Socio-Economic Analysis (M)

Module	**Methods for Socio-Economics Analysis**							
Code	**UT-C-21M**							
Coordinator	Dr. (c) Roberto Jara Rojas							
Language	English/Spanish (Literature in English)							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	Second Semester							
Instructor	Prof. PhD. Boris Bravo-Ureta							
Content	• Introduction to qualitatitve and quantitative methods of analysis of socio-economic • Design of records and questionnaires for rural areas in developing countries • Methods of descriptive Data analyse with SPSS and STATA (data entry, key-specific statistical tests). • Econometric methods with emphasis on multivariate regression							
Objectives	The module is specifically aimed at students who are involved in the application of instruments for fieldwork research and who are interested in statistical methods for issue of rural and agricultural development in developing countries.							
Literature	ABurns, R.B. (2000): Introduction to research methods (4th E), Sage Publications, London Maxim, P.S. (1999): Quantitative research methods in the social sciences, Oxford University Press, New York Bernard, R.H. (2000): Social science research methods, Qualitative and quantitative approaches, Sage Publications, London Sadoulet, E., & A. de Janvry (1995): Quantitative Development Policy Analysis, John Hopkins University Press, Baltimore and London Tatian, P., Designing a data entry and verification system, IFPRI, Microcomputer in Policy research series N°1 Greene, W. (1997): Econometric Analysis (3rd E), Prentice Hall R.S. Pindyck & D.L. Rubinfeld (1991): Econometric Models and Economic Forecasts (3rd E), McGraw Hill							
Work sytem usability	Economy			Organic			Tropical	
	M							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [Contact h]	56						28	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
		X		X			X		
Grade Composition	Written test: 50 % Seminar Presentation: 30 % Work report: 20 %							

UT-C-22 Financial Management I

Module	**Financial Management I**							
Code	**UT-C-22**							
Coordinator	Prof. Dr. Alejandra Engler							
Language	English/Spanish							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	Second Semester							
Instructor	Prof. Dr. Alejandra Engler Guest professors from the Faculty of Economics							
Content	Principles of accounting, the cost Grunsätze accounting, analysis of financial statements, operational planning, budget planning, ensuring liquidity, debt management							
Objectives	The aim of the module is the switching of the principles of accounting for decision making and short term financial planning.							
Literature	Van Horne, J. (2004): Administración Financiera, (10th E). Editorial McGraw – Hill, España, 2004 Horngren, C., G. Foster y S. Datar (2002) Contabilidad de Costos: Un enfoque gerencial (10th E), Perason Educación							
Work sytem usability	Economy			Organic			Tropical	
	M							
Instruction type	Lecture		Seminar	Excursion	Practice		Tutorial	Project
Duration [Contact h]	54		20				10	
Examination type	Oral Test	Written test	Home work	Sem. Speech	Protocoll	Work report	Proj.work	Proj.pres
		X		X				
Grade Composition	Written test: (2) 80 % (Each 80%) Seminar Presentation: 20 %							

UT-O-23 Human Resource Management

Module	**Human Resource Management**							
Code	**UT-O-23**							
Coordinator	Prof. MBA. Paula Manríquez							
Language	English/Spanish (Literature in English and Spanish)							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	Second Semester							
Instructor	Prof. MBA. Paula Manríquez							
Content	• The psychology of workers, human relations, perception, communication and group dynamics. • Interpersonal relationships at work. Organizational structures in agribusiness, motivation, goal setting and work performance, dynamics of change • Leader and the group. Leadership, power, problem solving, decision making udn creativity in agribusiness. • Laws and Ethics, rights of workers, unions, ethics. • Growth and future patterns in agribusiness, job search skills, wellness, future tasks.							
Objectives	• Introduction to the fundamentals of human resource technology • Improving the efficiency of enterprises in the agribusiness • Relaying of current knowledge in human resources and sniff • Dissemination of knowledge of management of agribusiness firms in different markets.							
Literature	Chiavenato, I. 2002. Gestión del talento humano. Primera Edición, McGraw Hill, Santiago. Gomez-Mejía, L., Balkin, D., and Cardy, R. 2001. Managing Human Resources. McGraw Hill, Third Edition, New Jersey. Stone,T. & Meltz,N. 1990. Human Resources Management in Canada. Second Edition, Prentice Hall, Toronto. George T. Milkovich y John W. Boudreau, "Dirección y Administración de Recursos Humanos". Werther Jr., W.B. & Davis, K. (1992): Administración de Personal y Recursos Humanos, (5th E), Human Relations. Dalton, Hoyle und Watts. South Western Publishing, Cincinnati Freedman, Sears y Carlsmith (1981): Social Psychology, Prentice Hall, N.J.							
Work sytem usability	Economy			Organic			Tropical	
	E							
Entry requirement	Admission to MIA program							
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [Contact h]	54						30	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
							X		
Grade Composition	Work report: 100%							

UT-O-24M Marketing in Agribusiness II (Marketing Research)

Module	**Marketing in Agribusiness II (Marketing Research)**								
Code	**UT-O-24M**								
Coordinator	Prof. Dr. Mauricio Ponce								
Language	English/Spanish (Literature in English and Spanish)								
Stud. Workload	180h (84Contact hours)								
Credits	6 ECTS								
Semester	Second Semester								
Instructor	Prof. Dr. Mauricio Ponce Prof. Dr. Marcos Mora González								
Content	• Methods of market research and marketing • Segmentation and positioning • Identification of market segments • Strategic analysis of market segments • Case studies from the marketing research in agribusiness								
Objectives	The module mediate the methods of market and marketing research. The students will work on a case study design and the methods are developed with the help of SPSS (Statistical Package for the Social Sciences)								
Literature	Aaker, D. A., V. Kumar and G. S. Day (2003): Marketing research (8th E), John Wiley & Sons Inc., New Jersey, Kinnear, T.B. and J. R. Taylor (1996): Marketing research: an applied approach (5th E), McGraw Hill Inc., New York Wind, Y. (1978): Issues and Advances in Segmentation Research, Journal of Marketing Research, Vol. 15, (August): pp. 317-337. Wittink, D., and Cattin, P. (1989): Commercial Use of Conjoint Analysis: An Update. *Journal of Marketing*, Vol. 53, (July): pp. 91-96 Malhotra, N. (2004): Investigación de Mercados, un enfoque aplicado (4th E), Pearson educación, México. 816pg. ISBN: 970-26-0491-5.								
Work sytem usability	Economy			Organic			Tropical		
	E								
Entry requirement	Participation in "Marketing in Agribusiness I (Strategic Marketing)"								
Instruction type	Lecture		Seminar		Excursion		Practice	Tutorial	Project
Duration [Contact h]	56							28	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
		X							
Grade Composition	Written test: 100%								

UT-O-25 Principles, Monitoring and Methods of Agricultural Projects Management Development Policies

Module	**Principles, Monitoring and Methods of Agricultural Projects Management Development Policies**							
Code	**UT-O-25**							
Coordinator	Dr. (c) Roberto Jara Rojas							
Language	English/Spanish (Literature in English and Spanish)							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	Second Semester							
Instructor	Prof. Dr. José Díaz Osorio							
Content	a) Planning and goal-oriented project planning (ZOPP) • Goals and Teamwork • Visualization • Project planning matrix (PPM) • Project planning process: projection, analysis and strategies. • Project organization and responsibility • Workshop on Participatory Planning • Example of project planning • Use and limitations of the instrument b)'Project Cycle Management' (PCM) • The model of the project management cycle • Management and participation in the practical development assistance • 'Tree Level Model' in the technical cooperation (TC) • Instruments of the 'Project Cycle Management' (PCM)							
Objectives	The aim of the module is an introduction to project management in technical cooperation (TC) and the mediation of the principles of project management. The instruments used are the "Project Cycle Management (PCM)" and the "Objectives-Oriented Project Planning (ZOPP)"							
Literature	Meredith and Mantel (1985): Project Management: A Managerial Approach. John Wiley and Sons, N. York. Ward and Deren (1991): The Economics of Project Analysis: A Practitioner's Guide, The World Bank, Washington DC. Deutsche Gesellschaft für Technische Zusammenarbeit (1998): ZOPP and PCM Methods. GTZ, GMBH http://www.gtz.de, Gesellschaft für technische Zusammenarbeit GTZ.							
Work sytem usability	Economy			Organic			Tropical	
	E							
Entry requirement								
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [Contact h]	36			40			8	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
			X	X				
Grade Composition	Home work: 50% Seminar-Presentation: 50%							

UT-M-26 Agricultural Innovation and Extension

Module	**Agricultural Innovation and Extension**							
Code	**UT-M-26**							
Coordinator	Dr. (c) Roberto Jara Rojas							
Language	English/Spanish (Literature in English and Spanish)							
Stud. Workload	180h (84Contact hours)							
Credits	6 ECTS							
Semester	Second Semester							
Instructor	Prof. Dr Alvaro Rojas-Marín							
Content	• Co-operation, decision making and conflict management in groups • Methods, organization, management and evaluation of agricultural extension • Agricultural Knowledge Systems: Relevant actors, type of communication, power structures • Innovation strategy, advice and adaptation: concepts of innovation, examples of lw. Company examples of product innovations, strategic consulting, adaptation theory. • Technical design for agricultural innovation: the concept of sustainability and design. Strategies for the improvement of agricultural enterprises. • Promotion of sustainable agriculture: new concepts of consultation to encourage innovation. • Supply chain management: concepts, strategies and examples from Latin America. • Social innovation design processes, interactive communication, the role of social actors, the design of soft System, decision making and conflict management.							
Objectives	– This module provides an introduction to the communication of innovations. – The students are able to analyze rural (or agricultural) development projects from the perspective of the actors involved – The aim of the module is to put the students in a position to develop strategies for the players involved in an agricultural innovation process							
Literature	Bollinger, E., Reinhart, P. and Zellweger, T. (1994): Agricultural Extension. Guidelines for extension workers in rural areas. Lindau Okali Ch.; Sumberg, J.; Farrington, J.: (1995): Farmer Participatory Research. Exeter Schwarzweller, H.K. (1987): Research in rural Sociology and Development, in: Third World Contexts Vol. 3. Greenwich							
Work sytem usability	Economy			Organic			Tropical	
	E							
Entry requirement								
Instruction type	Lecture		Seminar	Excursion		Practice	Tutorial	Project
Duration [Contact h]	56						28	
Examination type	Oral Test	Written test	Home work	Sem. Speech		Protocoll	Work report	Proj.work	Proj.pres
	X			X				X	
Grade Composition	Oral test: 50 % Seminar presentation & Proj. Work: 50 %							