

Module Name		Module Code	
Biocontrol Biotechnology		agrigAEF014-01a	
Module Coordinator			
apl.-Prof. Dr. Ralf-Udo Ehlers			
Organizer			
Institute of Phytopathology			
Faculty			
Faculty of Agricultural and Nutritional Sciences			
Examination Office			
Faculty of Agricultural and Nutritional Sciences - Examination Office			
ECTS Credits	6		
Evaluation	Graded		
Duration	one semester		
Frequency	Only takes place during winter semesters		
Workload per ECTS Credit	30 hours		
Total Workload	180 hours		
Contact Time	60 hours		
Independent Study	120 hours		
Teaching Language	English		
Recommended Requirements			
Fundamental knowledge in plant protection, pests and diseases in agriculture and horticulture, zoology, microbiology			
Module Courses			
Course Type	Course Name	Compulsory/Optional	SWS
Seminar	Projects in Biological Control	Compulsory	1
Practical course	Projects in Biological Control	Compulsory	1
Lecture	Biotechnology in Biological Control	Compulsory	1
Lecture	Biology of Antagonists	Compulsory	1

Examination(s)				
Examination Name	Type of Examination	Evaluation	Compulsory / Optional	Weighting
Oral Examination: Biocontrol Biotechnology	Oral Examination	Graded	Compulsory	100
Further Information on the Examination(s)				
1.+2. period in winter semester 1. period in summer semester examiner: Prof. Dr. Ehlers QIS: 91702 with number of Examination 91710				
Course Content				
Microbial and macrobial biological biocontrol agents, biology, genetics, mass production, formulation, application, ecology, use of genes from biocontrol agents in transgenic crops, genetic improvement of marker-supported breeding of entomopathogenic nematodes, safety, registration, laboratory demonstrations in classic biotechnology up- and downstream processing, commercial aspects of biological control production and marketing, projects in biocontrol				
Learning Outcome				
Successful completion of this module will help you to understand the principles of biological control and its application in agri- and horticulture. It enables you to plan and execute biocontrol concepts including selection of biocontrol agents, mass production, downstream processing and formulation. Teaching at a company facility provides you with an insight into technical and social aspect of technology transfer and economies of scale. You will learn to use molecular tools for genetic improvement of biocontrol traits and application of biocontrol genes in transgenic plants. The module is a unique opportunity to experience exploitation of biodiversity for plant protection by fusing biology with classical and molecular biotechnological tools for development and production of environmentally friendly biocontrol products.				
Reading List				
Ehlers, R.-U. 2001. Mass production of entomopathogenic nematodes for plant protection. Applied Microbiology & Biotechnology 56, 623-633. Sumaya, N. H., Gohil, R., Okolo, C., Addis, T., Doerfler, V., Ehlers, R.-U. & Molina, C. (2018) Applying inbreeding, hybridization and mutagenesis to improve oxidative stress tolerance and longevity of the entomopathogenic nematode <i>Heterorhabditis bacteriophora</i> . Journal of Invertebrate Pathology 151, 50-58. https://en.wikipedia.org/wiki/Biological_pest_control				

Use		
Master, 1-subject, Agricultural Sciences, Agricultural Economics, (Version 2AE)	Optional	-
Master, 1-subject, Agricultural Sciences, Agricultural Economics, (Version 2013)	Optional	-
Master, 1-subject, Agricultural Sciences, Agribusiness, (Version 2017)	Optional	-
Master, 1-subject, Agricultural Sciences, Agribusiness, (Version 2013)	Optional	-
Master, 1-subject, Agricultural Sciences, Crop Sciences, (Version 2017)	Optional	-
Master, 1-subject, Agricultural Sciences, Crop Sciences, (Version 2013)	Optional	-
Master, 1-subject, Agricultural Sciences, Animal Sciences, (Version 2017)	Optional	-
Master, 1-subject, Agricultural Sciences, Animal Sciences, (Version 2013)	Optional	-
Master, 1-subject, Agricultural Sciences, Environmental Sciences, (Version 2017)	Optional	-
Master, 1-subject, Agricultural Sciences, Environmental Sciences, (Version 2013)	Optional	-
Master, 1-subject, AgriGenomics, (Version 2017)	Optional	-
Master, 1-subject, AgriGenomics, (Version 2010)	Optional	-
Master, 1-subject, Biochemistry and Molecular Biology, (Version 2016)	Optional	-
Master, 1-subject, Biochemistry and Molecular Biology, (Version 2007)	Optional	-
Master, 1-subject, Biology, (Version 2015)	Optional	-
Master, 1-subject, Biology, (Version 2011)	Optional	-
Master, 1-subject, Biology, (Version 2007)	Optional	-
Master, 1-subject, Dairy Science, (Version 2017)	Optional	-
Master, 1-subject, Nutritional and Food Science, (Version 2013)	Optional	-