Module Name	Module Code
Ecosystems Modeling	EMAEF031-01a
Module Coordinator	
Prof. Dr. Kai Wenzel Wirtz	
Organizer	
Institute for Natural Resource Conservation - Ecosystem Management	
Faculty	
Faculty of Agricultural and Nutritional Sciences	
Examination Office	
Faculty of Agricultural and Nutritional Sciences - Examination Office	

ECTS Credits	6
Evaluation	Graded
Duration	on 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	German

Recommended Requirements
Fair knowledge in environmental/biological sciences basic skills in mathematics (e.g. exponential function, derivatives) experience with a programming language (e.g., „R“) For ensuring the traits 2-3, participation at a preparatory course offered few weeks before the seminar is strongly recommended

Module Courses

Course Type	Course Name	Compulsory/Optional	SWS
Lecture	Introduction to Ecosystem Modeling	Compulsory	1
Exercise	Introduction to Ecosystem Modeling -Practical Exercises	Compulsory	3

Examination(s)				
Examination Name	**Type of Examination**	**Evaluation**	**Compulsory / Optional**	**Weighting**
Protocol: Ecosystems Modeling	Protocol	Graded	Compulsory	100

Further Information on the Examination(s)

1.+ 2. period in winter semester
1. period in summer semester
examiner: Prof. Dr. Wirtz<
QIS: 75202 with number of Examination 75220

Course Content

Models generate new knowledge from combining hypotheses with existing data. Ecosystem models integrate knowledge from different disciplines, and link fundamental with applied research. This module conveys the basic elements and application types of ecosystem models. It illustrates how the modelling process is subdivided into single phases that proceed from problem identification towards communication of results.
The core of the course is dedicated to a selected problem of environmental sciences (e.g. coastal eutrophication). Students will build simple models on their own along a structured set of exercises. They will create scenarios and learn to assess potentials and limitations of models. These practical (group) exercises will make use of existing data and a programming package R (altern. MATLAB). Special emphasis is put on the effective presentation of scientific results.

Learning Outcome

Major learning objectives of this course are:
to understand basic modelling concepts
to be able to evaluate models and their applications to build and run a simple model yourself
to present a scientific study

Reading List

Soetaert, K & and PMJ Herman (2009): A Practical Guide to ecological Modelling.
Haefner, J.W. (2005): Modelling biological systems: principles and applications. 2nd edition.
Slides, NETLOGO, R

Additional Information

Maximum number of participants: 16
Enrollment kai.wirtz@hzg.de within workdays Monday through Friday in the 1nd week of the 2. audit period of the preceding semester. Following information are necessary:
matriculation number
last name
first name
degree study program
stu-Email

The allocation of the places takes place in the 2nd week of the 2. audit period of the preceding semester. Acceptance of the place by students only through participation at the first day of the course. Students without a place can get a place at the first day of the course by move-up procedure.

Use	Compulsory / Optional	Semester
Master, 1-Subject, Agricultural Sciences, Specialisation Agricultural Economics, (Version 2017)	Optional	-
Master, 1-Subject, Agricultural Sciences, Specialisation Agribusiness, (Version 2017)	Optional	-
Master, 1-Subject, Agricultural Sciences, Specialisation Crop Sciences, (Version 2017)	Optional	-
Master, 1-Subject, Agricultural Sciences, Specialisation Animal Sciences, (Version 2017)	Optional	-
Master, 1-Subject, Agricultural Sciences, Specialisation Environmental Sciences, (Version 2017)	Optional	-
Master, 1-Subject, Environmental Management, Double-Degree-Agreement with Adam-Mickiewicz-University, Polen (UAM), (Version 2020)	Optional	-
Master, 1-Subject, Environmental Management, Double-Degree-Agreement with Irkutsk State University, Russland (ISU), (Version 2020)	Optional	-
Master, 1-Subject, Environmental Management, (Version 2020)	Optional	-
Master, 1-Subject, Nutritional and Food Science, (Version 2013)	Optional	-
Master, 1-Subject, Nutritional and Consumer Economics, (Version 2017)	Optional	-
Master, 1-Subject, International Master in Applied Ecology, (Version 2020)	Optional	-
Master, 1-Subject, Sustainability, Society and the Environment, (Version 2020)	Optional	-