Module Name	Module Code
Ecosystems Modeling	EMAEF031-01b

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	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
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**
Exercise	Introduction to Ecosystem Modeling -Practical Exercises	Compulsory	3
Lecture	Introduction to Ecosystem Modeling	Compulsory	1

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

Further Information on the Examination(s)

1.+2. period in wintersemester
1.   period in summersemester

examiner: Prof. Dr. Wirtz
QIS: 75201 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, Agricultural Economics, (Version 2017)	Optional	1.
Master, 1-subject, Agricultural Sciences, Agricultural Economics, (Version 2013)	Optional	1.
Master, 1-subject, Agricultural Sciences, Agribusiness, (Version 2017)	Optional	1.
Master, 1-subject, Agricultural Sciences, Agribusiness, (Version 2013)	Optional	1.
Master, 1-subject, Agricultural Sciences, Crop Sciences, (Version 2017)	Optional	1.
Master, 1-subject, Agricultural Sciences, Crop Sciences, (Version 2013)	Optional	1.
Master, 1-subject, Agricultural Sciences, Animal Sciences, (Version 2017)	Optional	1.
Master, 1-subject, Agricultural Sciences, Animal Sciences, (Version 2013)	Optional	1.

Master, 1-subject, Agricultural Sciences, Environmental Sciences, (Version 2017)	Optional	1.
Master, 1-subject, Agricultural Sciences, Environmental Sciences, (Version 2013)	Optional	1.
Master, 1-subject, Applied Ecology, (Version 2016)	Optional	1.
Master, 1-subject, Applied Ecology, (Version 2015)	Optional	1.
Master, 1-subject, Dairy Science, (Version 2017)	Optional	1.
Master, 1-subject, Environmental and Resource Economics, (Version 2014)	Optional	1.
Master, 1-subject, Environmental Management, (Version 2017)	Optional	1.
Master, 1-subject, Environmental Management, (Version 2013)	Optional	1.
Master, 1-subject, Nutritional and Food Science, (Version 2013)	Optional	1.
Master, 1-subject, Nutritional and Consumer Economics, (Version 2017)	Optional	1.
Master, 1-subject, Nutritional and Consumer Economics, (Version 2013)	Optional	1.
Master, 1-subject, Sustainability, Society and the Environment, (Version 2013)	Optional	1.
Master, 1-subject, Environmental Geography and Management, (Version 2015)	Optional	1.
Master, 1-subject, Environmental Geography and Management, (Version 2013)	Optional	1.