

## Ecosystem Functioning (C003323)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)  
Credits 5.0 Study time 150 h Contact hrs 56.0 h

### Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	English	Gent	microteaching	16.25 h
			lecture	23.75 h
			seminar: coached	16.25 h
			exercises	

### Lecturers in academic year 2020-2021

Moens, Tom	WE11	lecturer-in-charge
Sabbe, Koen	WE11	co-lecturer

### Offered in the following programmes in 2020-2021

	crdts	offering
<a href="#">Master of Science in Teaching in Science and Technology (main subject Biology)</a>	5	A
<a href="#">Master of Science in Biology</a>	5	A
<a href="#">Exchange Programme in Biology (master's level)</a>	5	A

### Teaching languages

English

### Keywords

Ecosystem processes, biodiversity-ecosystem functioning, functional traits, resilience, stability, species loss, invasiveness, foodweb interactions, experimental design

### Position of the course

This specialised course aims to provide insight into selected ecosystem functions and how they are affected at different spatial and temporal scales by richness, evenness and dominance of species and functional traits. The influence of biodiversity and functional diversity on the stability and resilience of communities and ecosystem functions, and the importance of trophic structure for ecosystem functioning, are other central themes of this course.

### Contents

Ecosystem functions and services at different spatial and temporal scales.  
Biodiversity-ecosystem functioning research: concepts and hypotheses.  
Biodiversity and the stability of ecosystem functioning.  
Structural and functional diversity measures; trait-based approaches.  
Analysis of biodiversity experiments: from pattern to mechanism.  
Foodweb structure and its implications for BDEF research.  
Microbial biodiversity and ecosystem functioning.  
Extinction scenarios and their predicted impacts on biodiversity.  
Effects of habitat fragmentation and dispersal on ecosystem functioning.  
Biodiversity and invasiveness and disease.  
Valuation and economics of ecosystem services.

### Initial competences

This course requires knowledge and understanding of basic concepts on populations, species, and their interactions as provided in the bachelor courses on ecology, population ecology, and community and ecosystems ecology or similar courses.

### Final competences

- 1 Master the theoretical concepts and hypotheses on diversity-functioning relationships.

- 2 Critically compare different measures of functional diversity, and calculate and interpret functional diversity.
- 3 Critically evaluate different experimental designs for assessing diversity-functioning relationships.
- 4 Understand the relevance of random vs natural-order species loss experiments for assessment of diversity-functioning relationships.
- 5 Understand how food web structure affects biodiversity-functioning relationships.
- 6 Know the relevance of microbial organisms for research on BDEF relationships.
- 7 Explain the predicted impacts of different extinction scenarios on biodiversity.
- 8 Understand how biodiversity affects invasiveness and disease resistance of communities.
- 9 Assess and interpret population-genetic diversity.
- 10 Master basic concepts on the economics of biodiversity and ecosystem services.
- 11 Critically discuss, present and evaluate relevant recent literature.
- 12 Assess the natural and societal relevance of biodiversity.

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Lecture, microteaching, seminar: coached exercises

#### Extra information on the teaching methods

Theory: lectures.

Guided exercises on the calculation of structural and functional diversity measures, on the partitioning of functional effects of diversity into diversity and identity-based components, and on the calculation and interpretation of stable-isotope based tracer experiments. Each guided exercise is preceded by an extensive introductory lecture.

Microteaching: students prepare - per two or three - a lecture on a relevant topic, based on one core paper chosen by the titulars and one or more self-chosen complementary papers. They also prepare discussion topics. Fellow students also have to read these papers and have to prepare questions for the presenting students. Each presentation is thus followed by an interactive discussion with peers and with the teachers.

Depending on the evolution of the COVID-19 pandemic, it is possible that alternative teaching methods will have to be introduced.

#### Learning materials and price

Lecture slides (available through Ufora), scientific articles

#### References

Biodiversity, Ecosystem Functioning, and Human Wellbeing

An Ecological and Economic Perspective

Edited by Shahid Naeem, Daniel E. Bunker, Andy Hector, Michel Loreau and Charles Perrings

Oxford University Press

ISBN13: 9780199547951

ISBN10: 0199547955

The book is not mandatory.

#### Course content-related study coaching

During and after each lecture, there is opportunity and time for questions. Several concepts and methods which are introduced during the lectures will be expanded, opportunity for questions will be allowed, and hands-on exercises will be provided during guided exercises and microteaching.

#### Evaluation methods

end-of-term evaluation and continuous assessment

#### Examination methods in case of periodic evaluation during the first examination period

Oral examination

#### Examination methods in case of periodic evaluation during the second examination period

Oral examination

#### Examination methods in case of permanent evaluation

Participation, report

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

#### Extra information on the examination methods

Period-bound evaluation: oral exam with extensive written preparation. Open questions; at least 3 open questions for each of the two titulars. Equal scoring weight is given to the examination part of each lecturer.

In the event that the COVID-19 pandemic would require more stringent safety measures, the exam will only be a written exam without oral feedback.

Non-period bound evaluation: score is based on scientific quality of presentation, on presentation skills, but at least as important is the active participation and quality of questions in the discussions regarding all group presentations.

#### Calculation of the examination mark

Period-bound evaluation (oral exam) contributes 14 points out of 20; non-period bound evaluation contributes the remaining 6 points.