

Responses in a Changing Marine Environment - Experiments in Marine Global Change Ecology (C003891)

Course size (nominal values; actual values may depend on programme)
Credits 6.0 Study time 150 h Contact hrs 52.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	seminar	35.0 h
		fieldwork	6.25 h
		lecture	7.5 h
		seminar: practical PC room classes	3.75 h

Lecturers in academic year 2018-2019

Van Colen, Carl	WE11	lecturer-in-charge
Braeckman, Ulrike	WE11	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
International Master of Science in Marine Biological Resources (main subject Applied Marine Ecology and Conservation)	6	A
International Master of Science in Marine Biological Resources (main subject Global Ocean Change)	6	A

Teaching languages

English

Keywords

Position of the course

This course deals with the experimental quantification of the effect of (a)biotic changes on the functioning of marine organisms and ecosystems and the critical interpretation of the outcome of experiments in relation to its design and the organism(s) and ecosystem under study.

To answer ecological research questions by means of well-designed experiments (lab or field).

To use experimental tools for the observation, quantification and modification of non-trophic species interactions under variable abiotic conditions.

To be able to quantify biogeochemical cycling in marine communities.

To be able to critically interpret the results of experimental approaches in relation to the characteristics of the species, community and habitat under study at different temporal and spatial scales.

Contents

The course will follow a 3-steps approach, whereby each step will consist of theory followed by a substantial practical part consisting of a specific case:

Step 1 (preparatory phase): analysis of an actual research question on global change in the marine environment, literature study and design of an experiment to answer the question put forward: correct formulation of a research question and hypothesis, digital sources analysis, experimental design, selection of model organism and model system, obtaining biological material (field or culture), critical interpretation of available protocols.

Step 2 (experimental phase): set-up of the experiment and application of up-to-date experimental facilities within the Belgian node of the network EMBRC (including culture collections): lab or field experiments, small-scale or large-scale, habitat-specificity of an experiment (intertidal, subtidal, deep sea, soft or hard substrate, benthic or pelagic, ...), planning and feasibility and risk analysis of an experiment, application of physiological

and biogeochemical measurements, use of chemical tracers.

Step 3 (interpretation phase): interpretation and correct reporting of the obtained outcome, standardisation of obtained measurements, failure analysis.

Initial competences

Bachelor level in sciences. Basic knowledge in ecology is recommended.

Final competences

- 1 To be able to apply biological, ecological and chemical knowledge to make decisions about practical aspects of the design and set-up of experiments making use of up-to-date techniques to answer ecological questions in relation to climate change and anthropogenic disturbance in marine ecosystems.
- 2 Critical interpretation of and correct reporting on the material & methods of an experiment and its outcome.
- 3 To be able to critically interpret the results of experimental approaches in relation to the characteristics of the species, community and habitat under study at different temporal and spatial scales.

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, fieldwork, seminar, seminar: practical PC room classes

Learning materials and price

References

Solan & Whitely (2016). Stressors in the Marine Environment: physiological and ecological responses; societal implications

Beaugrand (2014). Marine Biodiversity, Climatic Variability and Global Change

Beukema & Brouns (2012). Expected Effects of Climatic Change on Marine Coastal Ecosystems

Course content-related study coaching

Evaluation methods

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

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

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Step 1 (preparatory phase): report on the research question and how to answer it

Step 2 (experimental phase): permanent evaluation while performing the experiment

Step 3 (interpretation phase): presentation and group discussion of the obtained results

Calculation of the examination mark