

## Marine Ecosystem Modelling (C004306)

Due to Covid 19, the education and assessment 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 6.0**                      **Study time 150 h**                      **Contact hrs**                      60.0h

### Course offerings in academic year 2021-2022

A (semester 1)                      English                      Gent

### Lecturers in academic year 2021-2022

Lombard, Fabien                      PARIS64      lecturer-in-charge  
 Stemmann, Lars                      PARIS01      co-lecturer

### Offered in the following programmes in 2021-2022

	crdts	offering
<a href="#">International Master of Science in Marine Biological Resources</a>	6	A

### Teaching languages

English

### Keywords

Ecosystem modeling, Population dynamics, Individual based modeling

### Position of the course

One main challenge in marine ecology is to train biologists and ecologists to develop and use mathematical models to solve scientific questions or manage complex systems. The aim is to give students the skills to understand, conceptualize, build, and operate different kinds of models focused on marine ecosystems. This teaching unit is based around a very practical approach where all lectures are followed by practical computer-based labs. Students will also have to conceive and write their own models.

### Contents

All the following topics will be tackled through courses followed by practical work:

- Ecophysiology and functional responses in Energetic and ecophysiological models
- Population dynamics, communities dynamics
- Physical- biological ecosystem models from 0 to 3 spatial Dimensions
- Individual Based Models and Lagrangian models
- Trait based modeling

### Initial competences

Having completed first year of the master  
 Marine ecology concepts, Basic mathematical background (reminders will be provided), Knowing how to use a computer (coding will be taught)

### Final competences

- 1 Ability to understand, conceive, build, and operate a simple model.
- 2 Ability to understand how the different hypothesis included in a model control its behavior.
- 3 Ability to understand the different uses of a model for scientific (for example biogeochemical budget) or operational (for example conservation) purposes, in order to solve the different questions it can respond to, and its limitations.
- 4 Ability to discuss with mathematicians or physical oceanographers on complex

model development and usages.

**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: plenary exercises, Practicum, Demonstration, Group work, Guided self-study, Seminar, Lecture, Self-reliant study activities, Project

**Learning materials and price**

**References**

**Course content-related study coaching**

**Assessment moments**

end-of-term and continuous assessment

**Examination methods in case of periodic assessment during the first examination period**

Written examination

**Examination methods in case of periodic assessment during the second examination period**

Written examination

**Examination methods in case of permanent assessment**

Assignment

**Possibilities of retake in case of permanent assessment**

examination during the second examination period is possible

**Calculation of the examination mark**

- 50% Written Exam
- 50% Practical Assignments