

Ecology of Coastal Communities (C004300)

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

Lantoine, François PARIS01 lecturer-in-charge
 Orignac, Jadwiga PARIS01 co-lecturer

Offered in the following programmes in 2021-2022

| | crdts | offering |
|--|-------|----------|
| International Master of Science in Marine Biological Resources | 6 | A |

Teaching languages

English

Keywords

Structure and evolution of coastal communities / biotic and abiotic effects on communities /Acclimation, adaptation / interactions / niche / spatiotemporal succession / Ecological modeling

Position of the course

The main goal of the course is to introduce students to the theory and characterization of the processes that regulate, control and affect coastal communities. This course will emphasis on both theoretical and practical approaches. Understanding communities' dynamics is a fundamental step in understanding Future Seas biodiversity changes.

Contents

- Role of pelagic and benthic communities in the functioning of coastal ecosystem
- Effects of environmental factors (abiotic, biotic) on community evolution
- Acclimation and adaptation processes of populations
- Top-down and bottom-up factors controlling communities
- Consequences of populations' adaptation on the ecosystem functioning
- Niche concepts in ecology
- Spatio-temporal succession in coastal communities
- Ecological Modeling
- Observation/experimentation/conceptual modeling

Initial competences

Basic knowledge in biological Oceanography, basic numerical methods, basic taxonomy.

Final competences

- 1 Learning how to observe and experiment on marine communities.
- 2 Learning how to characterize them, as well as the adaptive landscape that shape them (constraints and adaptation to their changing environment).
- 3 Learning how to analyze and model species assemblages and community dynamics, including metacommunities.
- 4 Methods to sample and study marine communities.
- 5 Methods to study and characterize their selective value.
- 6 Methods to simulate marine community dynamics.

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

Practicum, Lecture, Self-reliant study activities

Extra information on the teaching methods

After a general and theoretical reminder of marine communities and specificities of the coastal ecosystem, we'll define and illustrate the main factors controlling the establishment, evolutions and succession of benthic and pelagic communities.

In connection with the theoretical approaches, four main practical works (PW) will permit to illustrate and conceptualize some factors controlling the communities by application of the concepts and methods during practical courses or field sampling and data analysis:

PW1: Effects of abiotic constraints on community structure and evolution: Study of phytoplankton's photoacclimation. This will illustrate bottom up structuring factors, adaptive trade-off with emphasis on individualistic traits (abiotic tolerance) of species and their interactions with the environment (niche requirements).

PW2: Effects of biological interactions on communities' structure: Experiment of filtering feeder on natural phytoplankton communities. This predation process will illustrate a top down effect on community selection (interspecific interaction) and the importance of benthic-pelagic coupling in coastal environment.

PW3: Spatio-temporal variability of communities. Experiment of colonization by benthic invertebrates (macrofauna) on new rocky substrate will illustrate the primary successional changes in benthic communities, interactions and competition processes in colonization of space.

PW4: Interaction modeling. The design and construction of simple models combining the different factors controlling communities dynamic, will allow student to visualize the community's interactions including external environmental factor and internal dynamic (predation/competition) processes on different spatial and temporal scales.

Learning materials and price

References

Ricklefs, R.E., Schluter, D., 1994. Species Diversity in Ecological Communities. Chicago U.P.

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

Oral examination, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

- Written examination: individual restitution of acquired knowledge and understanding of the course
- Oral presentation in small group of the results and analysis based on the

practical works

Calculation of the examination mark

- 50% Written Exam
- 50% Oral - Practical Assignments