GHENT UNIVERSITY

Course Specifications

From the academic year 2020-2021 up to and including the academic year

Characterizing Dynamics and Trends in Coastal Environments (C004298)

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

Le Bris, Nadine	PARIS01	lecturer-in-charge
Pruski, A.	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

Fluctuations and Trends in coastal environments, Drivers of global-change impacts on coastal ecosystems, Observing programmes and databases in coastal oceanography, Time series acquisition and analysis, monitoring of ecosystem dynamics

Position of the course

This course is presenting the needs and state of the art for characterizing the variability and trends in coastal ecosystems. Lectures will first introduce the driving processes of environmental fluctuations and long-term changes in the coastal zone and the synergies of stressors arising from climate change and other human impacts. It will consider observing strategies and the associated oceanographic, environmental and biological databases. Joint lectures and practical works will introduce statistical methods used for time-series analysis and sets the bases of data series integration into regional circulation models (e.g. productivity, connectivity).
Current monitoring programmes and their capacity to inform about the vulnerability and sustainability of coastal ecosystems will be explored through tutored projects and case-studies.
The objectives of the course are:

- To gain insight into the current methods and tools implemented to monitor variability and trends in marine environment/ecosystems
- To gain insight into processes driving fluctuations and long-term changes in the coastal zone
- To learn numerical and statistical methods to analyse variability and trends in biological oceanography and marine ecology
- To explore physical, chemical and biological time-series databases providing the core knowledge to assess vulnerability and establish scenarios.

Contents

1 Drivers of changes in coastal ecosystems: land-ocean and air-sea interaction, trends and critical risks.
2 Variability of oceanic systems: scales, trends and observing methods in the coastal zone, monitoring of abiotic fluctuations with benthic stations, geochemical tracers and paleooceanographic records.
3 Introduction to the computer methods applied to space and time data series; Using R and Matlab
4 Introduction to the DPSIR (Driver, Pressure, State, Impact and Response approach) to assess ecosystem health status, monitoring pollution and water quality indexes

Initial competences

- General marine ecology concepts
- Basic physical and chemical oceanography concepts

Final competences

1 Knowledge of driving processes of environmental changes in the coastal zone and the synergies of stressors from climate change and other human impacts.
2 Knowledge of observing infrastructures and benthic platforms for coastal ocean / ecosystems.
3 Experience of data mining in ocean/biodiversity/ecosystem databases.
4 Experience of numerical methods used to analyse the periodicities and trends in coastal ecology.
5 Case studies of global change impact monitoring in coastal ecology.

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, Seminar: coached exercises

Extra information on the teaching methods

- 20 h of theoretical lectures.
- 30h of tutored projects and practical works

Learning materials and price

The students will be provided with the electronic support of the lectures (as PDF files).

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

Extra information on the examination methods

Written examination and a personal project developed by student pairs

Calculation of the examination mark

- 60% Written Exam
- 40% Project