GHENT UNIVERSITY

Course Specifications

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

Management and Conservation of Marine Ecosystems (C004309)

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

Andersen, A.	PARIS01	lecturer-in-charge
Riera, P.	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

- pollutions and anthropogenic effects
- marine protected areas MPA-
- Water Framework Directive (WFD), i.e. DCE
- Marine Strategy Framework Directives i.e. DCSMM
- imposex and TBT pollution,
- harmful plankton, red and green tides.

Position of the course

The teaching has two main axes: pollution and marine protection. The first part gives an overview of the pollution state in the North European waters (OSPAR areas) and their incidence on the marine fauna and human health, and it explains about the effects of man-made constructions on coastal communities. It also shows the actors of harmful plankton. The second part explains how to design marine protected areas in both temperate coastal areas, as also in vulnerable polar high seas areas.
This teaching unit comes after the teaching about the structure and functioning of the marine coastal ecosystems in natural unpolluted conditions (or with very low pollution levels).

Contents

Two main objectives: learn how to evaluate the pollutions levels (1) and how to protect the costal ecosystems (2).
1- Pollutions: Learning about the pollutions and man-made effects on marine coastal environments, and learn how to monitor the pollution level using various practical methods (AMBI, M-AMBI, IE2C, etc... Imposex levels and other DCE and DCSMM indices).
Pollutions types : Broad overview about the pollutions threatening the marine ecosystems:
- Chemical pollutants: trace metals, radionucleids, Polycyclic Aromatic Hydrocarbons (PAH), Organohalogens (PCBs), Dioxines & Furanes, Pesticides and other Persistent Organic Pollutants (POPs) such as TBT, plastic and litter...
- Biological pollutants: sewage and organic matter, eutrophication and harmful blooms

Practical work on:
- Eutrophication and harmful phytoplancton species,
- Persistent Organic Pollutants: Tributyltin (TBT) and Snail Imposex,
- AMBI, M-AMBI, IE2C calculations
- Large species surveys to analyze and to present.

2- Marine conservation and protection: how to create effective marine protected areas (MPA).
- AMP at high Seas in the Antarctic areas : example of ROSS Sea
- Practical work in the classroom on dedicated articles

Initial competences

Broad knowledge in Marine Biology :

- having the basic knowledge of the biology about invertebrate phyla
- knowing how to identify the common species on rocky and sandy shores
- broad knowledge in marine macroalgae and microalgae, identification and life cycles

Broad knowledge in Marine Ecology:

- know the structure and functioning of the intertidal and coastal ecosystems on rocky and sandy shores.

Final competences

1 To be able to assess the health quality of a marine ecosystem.
2 To know the prerequisites for creating an effective Marine Protected Area (MPA).

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, Seminar, Lecture, Fieldwork, Seminar: practical pc room classes

Extra information on the teaching methods

- Lectures on dedicated topics (24hours)
- Seminars by skilled workers in environmental agencies, and from a natural marine park (6 hours).
- Practical works on indices from the sampling of the field to the work in the laboratory (identification of species, counting, dissections etc...) to the final calculation of the indices (36 hours)

Learning materials and price

- field sampling,
- stereo-zoom binoculars and microscopes for species identification and dissections
- taxonomic keys and related articles.
- Computerized classrooms for the calculation and writing

References

- Amiard, J-C. 2013. Le risque radioactif. Devenir des radioéléments dans l'environnement et les risques pour la santé.
- Anderson D M, Glibert, P.M.; Burkholder J.M. Harmful Algal Blooms and Eutrophication: Nutrient Sources,
- Composition, and Consequences. Estuaries 25: 704-727
- Borja, A., J. Franco and V. Perez, 2000 A marine Biotic Index to establish the ecological quality of soft-bottom benthos within European estuarine and coastal environments. Marine Pollution Bulletin 40: 1100-1114.
- Davies IMM, A.; Bauer, B.; Hardinga M. J. H.; and Wellsa D. E. (1999) QUASIMEME laboratory performance study of the biological effects of tributyltin (imposex and intersex) on two marine gastropod molluscs. J Environmental Monitoring 1: 233-238.
- Monaco A. et Prouzet P. 2014a. Vulnérabilité du système océanique. Editions ISTE 330 pp. 378.
- Monaco A. & Prouzet, P. 2014b. Risques côtiers et adaptations des sociétés. Editions ISTE pp. 357.
- Riera P., Stal L.J., Nieuwenhuize J. 2000 Heavy d15N in intertidal benthic algae and invertebrates in the
- Scheldt estuary (The Netherlands): effect of river nitrogen inputs. Estuarine, Coastal and Shelf Science 51: 365-37

Course content-related study coaching

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

- group field work and analyses, with ppt and oral presentations.
- final written exam.

Calculation of the examination mark

- oral 40%
- written 60%