GHENT UNIVERSITY

Course Specifications

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

Instrumentation and Acquisition of Data in Oceanography (C004308)

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

Irisson, Jean-Olivier PARIS01 lecturer-in-charge

Offered in the following programmes in 2021-2022	crdts	offering
International Master of Science in Marine Biological Resources	6	A

Teaching languages

English

Keywords

Position of the course

The goal of this course is to make students operational for the treatment of oceanographic data typically associated with a scientific cruise or monitoring program (regarding hydrography, hydrology, biogeochemistry, and biology). This means processing and extracting data from raw samples, dealing with all the imperfections of real data, and analysing it to answer a specific scientific question. The data analysed will be mainly the one collected during the cruise in the preceding teaching unit (IADO). It takes advantage of the tools and knowledge developed over the last 15 years of research in Villefranche-sur-mer: automated plankton imaging instruments and software, Argo floats and gliders data processing pipelines, etc.

Contents

- Programming in R
- Samples processing: semi-automated plankton sorting
- Zooplankton distribution and biomass estimation
- Data mining: PCA, CA, clustering, introduction to machine learning
- Spatial interpolation: numerical interpolation and kriging
- Signal processing
- Processing of Argo floats data
- Personal data exploitation project based on real cruise data

Initial competences

Having completed first year of the master
- General marine ecology concepts
- Basic physical and chemical oceanography concepts
- Usual inferential statistics (ANOVA, regression)
- Basic knowledge regarding the taxonomic identification of organisms

Final competences

1 Ability to use image analysis tools for plankton identification.
2 Ability to set up a data processing pipeline which enables reproducible analyses.
3 Ability to process large amounts of data.
4 Ability to handle high-frequency data.
5 Ability to choose appropriate data analysis techniques.
6 Ability to present a summary of results (of an oceanographic cruise) with a

critical view.

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

Group work, Lecture, Project

Extra information on the teaching methods

Classes
- Practical work in reduced groups
- Personal projects in pairs

Learning materials and price

Slides of each course provided.

References

None

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 exam on the theoretical part (the classes)
- Written cruise plan (based on official cruise plan templates)
- Oral presentation of the cruise plan.

Calculation of the examination mark

- 30% Written Exam
- 50% Oral presentation of the personal work
- 20% Poster