

## Methods for the Exploitation of Data in Oceanography (C004307)

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

Mousseau, Laure                      PARIS01                      lecturer-in-charge

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

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

Oral examination, Assignment

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

examination during the second examination period is possible

**Calculation of the examination mark**

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