Course Specifications
Valid as from the academic year 2017-2018

Integrated Offshore Exploration (C003998)

Course size (nominal values; actual values may depend on programme)
Credits 6.0 Study time 150 h Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2017-2018
A (semester 2)
lecture 20.0 h
project 10.0 h
seminar: practical PC room classes 20.0 h
fieldwork 10.0 h

Lecturers in academic year 2017-2018
Van Rooij, David
WE13 lecturer-in-charge

Offered in the following programmes in 2017-2018
Master of Science in Geology 6 A
Master of Science in Marine and Lacustrine Science and Management 6 A
Exchange programme in Geology (master's level) 6 A

Teaching languages
English

Keywords
Drilling and coring techniques, site survey, geophysical borehole logging, seismic profiling, multibeam bathymetry, sidescan sonar, visual seabed mapping

Position of the course
The sampling of sedimentary archives through drilling is a common technique for academic and economical goals, both onshore as offshore. The selection of the target site is taking in account many prerequisites, among which a thorough risk analysis. Therefore, a detailed site survey needs to be carried out. This course will zoom in on all aspects of such a site survey as well as the execution of the drilling, with special attention to the geophysical characterisation of the seafloor and the (shallow) subsurface. The objectives of this course contribute to the skill of unravelling the multidisciplinary and integrated exploration strategies of shallow shelf seas down to continental slopes.

Contents
1. Introduction: fundamental scientific and industrial objectives of seafloor research, as well as legal, ethical, logistical and budgetary aspects. Importance of a correct site survey prior to invasive drilling: risk assessment
2. Basic principles and techniques regarding geophysical seafloor mapping: multibeam bathymetry & backscatter, sidescan sonar, AUV
3. Visual & oceanographic observation techniques: ROV, ADCP, CTD
4. Seismic profiling: single- vs. multichannel seismics. Advanced processing & interpretation
5. 3D-4D seismics: acquisition, processing and interpretation (attributes)
6. Sampling techniques: long cores, vibrocoring, drilling
7. Geophysical characterisation of cores and boreholes
8. Integration of drilling and seismics: practical aspects

Initial competences
Bachelor geology and has followed the course of exploration geophysics

(Approved)
Final competences

1. The student has acquired qualities in the drafting of a multidisciplinary offshore exploration strategy.
2. The student is aware of potential technical and environmental risks and can make a risk assessment for a drilling campaign.
3. The student possesses an overview of the most common marine surveying techniques and knows the basic skills for acquisition, processing and interpretation.
4. The student can integrate geophysical drilling data into a geophysical seabed survey project.
5. The student is familiar with the technical vocabulary and can report and present the technical results of a survey.

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, project, fieldwork, seminar: practical PC room classes

Extra information on the teaching methods

- The research activities are interactive in which the active contact between student and lecturer or instructor is central.
- During the fieldwork on board of RV Simon Stevin, shallow geophysical data will be acquired that will determine where (short) coring will be applied.
- The PC-class exercises endeavor to learn the students a set of basic software skills in order to process and present the acquired data. This will be performed using both academic as industrial datasets.
- The project includes a critical interpretation, evaluation and presentation of a technical and scientific dataset of an IODP (or other) drilling project and site survey. This will be concluded in writing a paper and a presentation. The evaluation process will use peer-review among the students.

Learning materials and price

Collection of powerpoint slides and a selection of scientific papers and relevant study material. This material is made available as PDF through the UGent MINERVA system.

References

Selected papers

Course content-related study coaching

The study counselling will be directly performed by the lecturers, assisted by post-docs, PhD students and teaching assistants. The survey part will be carried out in collaboration with VLIZ.

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Oral examination, assignment

Examination methods in case of periodic evaluation during the second examination period

Oral examination, assignment

Examination methods in case of permanent evaluation

Participation, assignment, peer assessment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

- Non-Periodical Evaluation: oral presentation and discussion of the project with fellow students
- Periodical Evaluation: the oral examination will interrogate the student about the written part of the project (paper), regarding the content as the aspects of the theory that have been addressed

Calculation of the examination mark

- NPE: active presentation of a project proposal with discussion and (self-)evaluation by lecturer and students (50%)  
- PE: oral exam about the project (50%)