UNIVERSITY OF GOTHENBURG

DEPARTMENT OF MARINE SCIENCES

MAR450 Chemical Dynamics in the Sea, 15 credits

Kemiska förlopp i havet, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Marine Sciences on 2016-10-03 and was last revised on 2018-03-01 to be valid from 2018-03-22, spring semester of 2018.

Field of education: Science 100%
Department: Department of Marine Sciences

Position in the educational system

The course can be taken as a freestanding course or as an elective course in a Master's Programme.

The course can be part of the following programmes: 1) Atmosphere, Climate and Ecosystems, Master's Programme (N2ACE), 2) Marine Science, Master's Programme (N2MAV) and 3) Master's Programme in Chemistry (N2KEM)

Main field of studies	*Specialization*
Marine Sciences	A1N, Second cycle, has only first-cycle course/s as entry requirements
Chemistry	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

A Bachelor´s degree in marine sciences or other relevant natural science subject at an accredited University, including at least 90 ECTS in the major subject is required. To provide the requirement in English by an internattionally recognized test, for example TOEFL. IELTS, the English proficiancy should be equivalent to the level of English &/English course B from Swedish upper secondary school.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- use chemical measurements to characterize biogeochemical cycles in the ocean
- understand the chemistry of benthic and pelagic coastal ocean processes
- recognize factors governing trace gas exchange
- understand calibration and traceability

Competence and skills

- use a range of sampling and analytical methods
- plan and execution of marine scientific research expedition

Judgement and approach

- use advanced hydro-acoustic survey data to identify sites for benthic studies

Course content

The course covers the extensive interactions between chemical, biological and geological processes in the ocean and its margins. Within this framework, the course focuses on the theory, practice and applications of marine chemistry. The major part of the course centers on planning, executing and reporting an expedition on the University´s new research vessel. This involves both group and individual project assignments.

Background to this project work is provided in the form of lectures covering the analytical challenges facing marine chemists, together with an overview of key chemical process in coastal systems. The role of marine chemistry in current global research projects is also presented.

The course covers:

analytical methods for marine chemistry, standards and traceability, marine pollution, marine organic matter, metal speciation, pelagic and benthic processes and the role of marine chemistry in Future Earth projects and other global projects.

Sub-courses

1. **Theory test** *(Dugga),* 5 higher education credits
   Grading scale: Pass (G) and Fail (U)
2. **Seminars and exercises** *(Seminarier och övningar),* 5 higher education credits
   Grading scale: Pass (G) and Fail (U)
3. **Project work** *(Projektarbete),* 5 higher education credits

Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)

Form of teaching

Teaching is conductes as: Lectures, Seminars and Projects in defined themes (the main part of the course).

Language of instruction:
English

Assessment

The course is examined by participation in seminars, written repots from group exercises and an individual report. At one occasion a short written exam (dugga) will take place.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U). Examination is done by active participation in lectures and group exercises and by an individually written report. Active participation in seminars and group exercises, as well as the short exam (dugga) are evaluated in a two grade scale (U/G), while the individual report is evaluated in a three grade scale (U/G/VG). G for the whole course requires G in all parts. VG for the whole course requires in addition a VG on the individual report.

Course evaluation

Oral and written course evaluations are done at the end of the course. The written evaluation is done anonymously. A summary of the evaluation is presented on GUL (University of Gothenburg´s learning platform). The resdults of the evaluation will be communicated to the students and will function as a guide for the development of the course. The results of the possible changes to the course will be shared with students who participated in the evaluation and students who are starting a new course.

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Additional information

The scientific cruise will involve some extra costs for the participants such as food on board and journey to and from mobilisation port on the Swedish west coast.

The course literature is published in a seprate document on the University´s learning platform.