UNIVERSITY OF GOTHENBURG

DEPARTMENT OF CHEMISTRY AND MOLECULAR BIOLOGY

KEM081 Advanced analytical chemistry, 15 credits

Avancerad analytisk kemi, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Chemistry and Molecular Biology on 2014-08-20 and was last revised on 2018-12-19 to be valid from 2019-01-01, spring semester of 2019.

Field of education: Science 100%
Department: Department of Chemistry and Molecular Biology

Other participating department
Department of Marine Sciences

Position in the educational system

The course is classified at the level 120-180 credits for Degree of Bachelor and can be counted as a course at second cycle level for Degree of Master (120 credits). The course is given in the Master programme (120 credits) in Chemistry and as a freestanding course. This course replaces course KEM080 and the courses can not be counted at the same time for a degree.

The course can be part of the following programmes: 1) Chemistry and learning, Master's Programme (N2KOL) and 2) Master's Programme in Chemistry (N2KEM)

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

Entry requirements

For admission to the course, completed and passed courses comprising 75 credits in the field of science are required, including passed result on course KEM070, Analytical Chemistry 1 (15 credits) or the equivalent knowledge.

Learning outcomes

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

Knowledge and understanding

- **account for** how chemometrics is used for qualitative classification and for evaluation of spectroscopic analysis data,
- **explain in detail** separation processes and detection methods,
- **explain in detail** the importance of the sample matrix for separation and detection methods.

Competence and skills

- **formulate, delimit and interpret** an analytical chemical problem.

Judgement and approach

- **connect** the outcome of the analytical chemical interpretation and a sustainable social progress,
- at an advanced level **compile,** as well as in oral and written form **present,** material from an analytical project.

The course is sustainability-related, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

Course content

The course provides deepened knowledge in the following fields of analytical chemistry:

- Classification and evaluation of analysis data with chemometrical methods
- Determination of organic trace elements
- Determination of inorganic trace elements

Sub-courses

1. **Project** *(Projekt),* 8 credits
   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
2. **Laboratory exercises** *(Laborationer),* 7 credits
   Grading scale: Pass (G) and Fail (U)

Form of teaching

Module 1: lectures, exercises and projects. In the project, an individual, written summary as well as oral presentation is included.

Module 2: Laboratory sessions.

The compulsory components in the course are the laboratory sessions and presentations.

Language of instruction: Swedish and English
As principal rule, the course is given in Swedish but can be given completely or partly in English if the circumstances require it.

Assessment

Module 1: Examination takes place by the written and oral presentation of the project.

Module 2: Examination takes place based on written presentations of the laboratory sessions.

For students who have not passed the regular examination, additional examination sessions are offered.

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 will normally be guaranteed at least three opportunities to take the examination (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).
Module 1: For grade Pass, completed oral and written presentations are required with approved result. For grade Pass with distinction, grade of Pass with distinction on the

presentations is required in addition.

Module 2: For grade Pass, active participation and passed presentations in all laboratory sessions are required.

For grade of Pass in the whole course, grade of Pass in both modules is required. For grade of Pass with distinction in the whole course, grade of Pass with distinction on module 1 and grade of Pass on module 2 are required.

Regarding application of the ECTS grading scale please see the vice chancellor's directive 28/05/2007, diary nr G 8 1976/07.

Course evaluation

The course is evaluated on the teaching platform of the university, and the results become subject to discussion between the teachers in the course and representatives for the students.

The results of the evaluation and possible changes to the course will be shared with students who participated in the evaluation and new students who are starting the course.