



KD1110 Chemical Measuring Techniques 7.5 credits

Kemisk mätteknik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for KD1110 valid from Autumn 2007

Grading scale

A, B, C, D, E, FX, F

Education cycle

First cycle

Main field of study

Chemistry and Chemical Engineering, Technology

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

When you have passed the course you will be able to:

- Plan and evaluate experiments with statistical methods.
- Describe and perform some fundamental chemical analysis methods.
- Choose and apply suitable calibrating models, and use statistical tests to handle the measuring data from varying chemical analyses.
- You will also be able to evaluate uncertainty and estimate which parameters contribute to the analytical method's uncertainty.
- You will also, by getting a fundamental knowledge of the most important analytical techniques that are used today, be able to assess which method is suitable for a given analytical problem and which disturbances that can be expected.
- You will evaluate the usefulness and limitations of different measurement techniques.

Course contents

Fundamental statistical parameters such as probability, normal distribution, standard deviation, variance and confidence interval will be presented. Based on this foundation regression methodology and analysis of variance will be treated. Further, spectroscopic and chromatographic techniques for chemical analysis will be presented both in lecture form and during laboratory experiments. Since practically all analytical methods are indirect time will be devoted to teaching the students the basics of calibration. Laboratory experiments and computer exercises will be closely linked to the statistical parts by application of the statistical methods on the analytical results obtained. Methods for optimising the usefulness of experimental results by careful design of the experiments will be treated. During later years aspects such as validation of analytical measurements and traceability of the results obtained have come into focus. No results of measurements are valid if their uncertainty is unknown. This very important area will be briefly summarised. During laboratory exercises an Excel - environment will be used for handling of the data obtained and for extraction of information. A computer based training material will be used as an aid in teaching statistical methodology.

Course literature

1. D.C. Harris, Quantitative Chemical Analysis
2. Handouts.

Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

1. Written exam, 4,5 credits.
2. Written laboratory reports, 3 credits.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.