



KE2190 Experimental Process Design 6.0 credits

Experimentell processdesign

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

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

Establishment

Course syllabus for KE2190 valid from Spring 2011

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering, Chemistry and Chemical Engineering

Language of instruction

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

Intended learning outcomes

The overall aim is to provide a basic knowledge about the design and analysis of chemical reaction processes related to energy production or environmental processes in laboratory scale.

After passed course the student is expected to be able to plan and realize laboratory experiments in an independent manner, using chemical reactors of different kinds.

After the course the student should be able to

- have on hands experience and be able to direct and carry on laboratory projects
- configure lab experiments in an optimal way, thus enabling a successful accomplishment of the experiments needed.
- build up an experiment-equipment from scratch, including equipment for measurement of reactant quantities, possible equipment for vaporization, reactor with equipment for temperature control, possible holder for catalyst, equipment for product separation and analyzing equipment.
- work up received experimental data and to present the results in a way that fulfils requirements on technical reports and publications in regard of disposition, clarity and for necessary documentation for possible reproduction.
- by oral presentations of all laboratory groups get a breath overview of a number of reaction systems and methods.
- have knowledge concerning risks for the lab personnel and about routines for handling environmental harming wastes from the laboratory.

Course contents

In this practical laboratory course, a small study of influencing parameters for an energy or environmental process will be performed in laboratory scale. The skills and knowledge gained is useful by analogy when solving problems typical for the chemical industry or for research.

The laboratory will contain either homogeneos-, hetrogenious- or electro-catalysis, preparation of catalysts or electrodes, or a purification method. The laboratory involves methods for measurement of flows of gas and liquids, temperatures, separation techniques, electro-chemical methods and other characterisation methods of gas, liquids and solids.

For the technical analysis, the course applies to knowledge about mass and energy balances and kinetic models for calculation of chemical reactors. The course is a exercise in process development and analysis, planning and evaluation of a sampling procedure and will be examined by a technical report and a small oral presentation at a seminary.

Specific prerequisites

Admission requirements for independent students:

75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding. Documented proficiency in English corresponding to English B.

Admission requirements for programme students at KTH:

At least 150 credits from grades 1, 2 and 3 of which at least 110 credits from years 1 and 2, and bachelor's work must be completed, within a programme that includes: 75 university credits (hp) in chemistry or chemical engineering, 20 university credits (hp) in mathematics and 6 university credits (hp) in computer science or corresponding.

Course literature

Scientific papers related to the selected laboratory experiments.

Examination

- LAB1 - Laboratory Work, 6.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

Laboratory work (LAB1; 6.0 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.