KE2195 Experimental Process Design 7.5 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 KE2195 valid from Autumn 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering

Specific prerequisites

Courses in KE1160 thermodynamics, KE1175 Chemical Process Technology, KE1170 Transport Phenomena or corresponding courses.

Language of instruction

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

Intended learning outcomes

The aim of this course is to provide basic knowledge in the implementation and analysis of chemical reaction processes related to energy conversion and environmental technology in laboratory scale.

After completing the course, the student shall be able to:

- independently design and carry out laboratory tests with chemical reactors of different kinds.
- apply statistical methods and principles for optimization of the processes
- evaluate the results based on the experimental and analytical work done.

Course contents

In this practical laboratory course, a study of different parameters affecting the outcome for energy and environmental related processes will be carried out in a laboratory scale. The skills and knowledge gained in such studies are useful by analogy when solving problems that are typical for the chemical industry or research. The laboratory work to be performed is mainly ascribed to either homogeneous or heterogeneous catalysis, different preparation steps of catalysts, application on porous electrodes or other reactor formulations, or in purification methods. The laboratory requires study and measurement of flow rates of gases or liquids, temepartures, separation techniques, electrochemical assessments as well as other characterisation methods for gases, liquids and solids.

For the analytical work basic knowledge in mass and energy balances as well as kinetic models for calculation of chemical reactors as well as electrochemical systems are required. An introduction to factorial and experimental process design as useful statistical principles and methods for practical application in process optimization will also be covered during the course. Main emphasis on the design of experiments related to various factors affecting product yield, purity, etc. are of special interest for analytical work. The course is an exercise in process development, optimization and integration with analysis, planning and evaluation of the results obtained for the particular project task. The examination is a result of the experimental work, submission of a thorough final report and an oral presentation at the end in a seminar.

Examination

- LAB1 - Laboratory work, 7.5 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.

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.