FKE3140 Applied Electrochemistry 6.0 credits

Tillämpad elektrokemi

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

Establishment

Course syllabus for FKE3140 valid from Autumn 2017

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Bachelor of Science in chemical engineering, chemistry, physics, materials or equivalent. Depending on your background you may have to read up on, for example, transport phenomena during the course.

Language of instruction

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

Intended learning outcomes

After the course you should

* understand and be able to use basic electrochemical concepts and relationships for analysis of electrochemical processes

* be able to perform simple electrochemical experiments and evaluate data to draw conclusions from the results

* describe electrochemical applications as batteries, fuel cells, electrolytic processes

* describe different types of electrochemical energy storage (batteries, fuel cells, electrolysis for hydrogen production) in a future sustainable energy system

Course contents

The electrochemical double layer, electrode kinetics, mass transfer in electrochemical systems, electrocatalysis. Design of electrochemical reactors, current distribution. Survey of electrochemical processes and power sources.

Experimental techniques.

Course literature

Electrochemistry, 2nd edition, by C.H. Hamann, A. Hamnett, W. Vielstich, Wiley-VCH (2007).

Handout from D. Pletcher and F. Walsh, Industrial Electrochemistry, Chapman and Hall Ltd, 1990, p. 385-404.

Summary of mathematical formulae, TEK 2010.

Exercises and solved examples, TEK 2014.

Current distribution in cells and porous electrodes, TEK 2010

Examination

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

Approved home assignments (3), approved laborations and corresponding reports (3), written exam.

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.