KE2171 The Fuel Cell 7.5 credits

Bränslecellen

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 KE2171 valid from Spring 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering

Specific prerequisites

At least 150 credits in a program of engineering or natural science, or corresponding knowledge. Documented proficiency in English corresponding to English B.

Language of instruction

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

Intended learning outcomes

Environmental and economical concerns have focused the attention on alternative power sources. In a future society fuel cells are expected to play an important role as energy converters in vehicles, portable electronics and for distributed heat- and power generation. In the course the special features of the fuel cells and their surrounding systems will be discussed for these different applications.

Course contents

In a future society fuel cells are expected to play an important role as energy converters in vehicles, portable electronics and for distributed heat- and power generation. In the course we will discuss:

• thermodynamics and kinetics of electrochemical reactions
• the design and operation of fuel cells
• components, design and thermodynamics of the whole fuel cell system
• fuels of fuel cells; their production, handling and reformation in fuel cell systems
• power electronics in fuel systems

Apart from lectures, tutorials are held in order to make it easier to understand the calculation directed parts of the course and also to give the students a practical experience of solving fuel cell related problems. An experimental lab exercise will give insight in practical fuel cell operation. Besides the teacher led activities there is also a compulsory group assignment, in which the students solve problems related to a fuel cell system for a given application. The group assignment is examined in a written report and in an oral exam.

Examination

- LAB1 - Laboratory work, 1.5 credits, grading scale: P, F
- PRO1 - Project assignment, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 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.

Other requirements for final grade

All parts in the course should be approved.

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.