KE2310 Sustainable Systems for Heat, Power and Materials Production 7.5 credits

Hållbara system för värme-, el- och materialproduktion

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 KE2310 valid from Autumn 2022

Decision to discontinue this course

The course will be discontinued at the beginning of Autumn 2022 according to school head decision: C-2022-2153.Decision date: 2022-09-28The course was given for the last time in Autumn 2022. The last opportunity for examination in the course is given in HT 2024.Parts of the discontinued course will be incorporated into a new course named CK2130 Sustainable production of fuels and materials. Students who are to be examined in the discontinued KE2310 will be offered an adapted examination on the occasions offered to students in the new course.

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemical Science and Engineering

Specific prerequisites

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

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.

Language of instruction

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

Intended learning outcomes

After completion of this course, the students should be able to:

- Recognize the principle of process integration for the achievement of higher efficiency both concerning the use of raw material and for reaching a better energy utilisation.
- Understand and be able to explain why the simultaneous production of several products may be advantageous in many situations but also when it is not relevant.
- Describe a number of relevant existing processes, commercial or under development.
- Critically analyse new possibilities for the simultaneous production of several products
- Evaluate and critically analyse competing possibilities for producing different products by using the same raw material or the production of the same products using different raw materials
- Analyse and criticise the interaction between technical and economic aspects in the development of process integrated systems
- Be familiar with some basic evaluation tools for the evaluation of complex process systems relevant for this course (e.g. pinch technology)
- Be able to perform simple calculations using the methods introduced in the course for process analysis.
- Plan and gather the technical data required for the carrying out of mass and heat balances describing an actual process idea.
- Discuss and identify a relevant system boundary for the process analysis

Course contents

Concept for simultaneous production of more than one product from the same raw material with the aim of reducing energy use and raw material consumption. Description of a number of existing, commercial systems and the discussion of systems in a development stage.

Examination

- INL1 - Assignment, 3.5 credits, grading scale: P, F
- TEN1 - Examination, 4.0 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

A pass grade on all parts

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.