KE1175 Chemical Process Engineering 6.0 credits

Kemisk Processteknik

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 KE1175 valid from Autumn 2020

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

KE1140 Engineering Chemistry
SF1625 Calculus in One Variable
SF1624 Algebra and Geometry

Language of instruction

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

Intended learning outcomes

On completion of the course, the technology student should be able to

- Dimension simple components in a chemical process system while taking into account aspects of sustainability
- analyse how kinetics and mass transfer affect the design and operation of chemical reactors
- analyse industrial separation processes for two-component mixtures
- analyse electrochemical systems by means of application of basic electrochemical concepts

Course contents

The course treats the basics in chemical process engineering that are based on relationships including kinetics, equilibria, diffusion and also the conservation of matter and thermodynamic relationships and basic electrochemical concepts, to evaluate chemical engineering processes for production of chemicals, heat or electricity. The basic principles of chemical engineering start from both microscopic and macroscopic mathematical models to describe essentially ideal processes in chemical process equipment.

- analyse the use of energy and materials in a production plant based on chemical engineering, environmental, social and economical criteria
- reflect in a structured way over his professional role as engineer and his professional responsibility in relation to sustainable development
- explain the concept of an ideal stage and utilise this at the design of a separation system in continuous systems
- suggest an appropriate separation method in a two-component system based on the physical properties of the compounds
- explain how the driving force for mass transport affects the design of a separation process with mass transfer
- explain the importance of volume change in a gas phase reaction in ideal reactors and calculate the actual residence time
- identify safety risks at the operation of reactors and separation units
- suggest design and control of ideal reactors to minimise waste based on ideal reactor models and selectivity criteria
- discuss the basic principles of process intensification and environmentally-friendly production

Examination

- BER1 - Calculation Assignments, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.

Other requirements for final grade

Approved examination and computational problems and laboratory sessions.

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.