KE2020 Chemical Engineering 9.0 credits

Kemisk apparatteknik

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

Establishment

Course syllabus for KE2020 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Chemistry and Chemical Engineering

Specific prerequisites

Recommended courses:
KE1030. Transport Phenomena and Engineering Thermodynamics
KE1020. Reaction and Separation Engineering
KE2070. Transport Phenomena, advanced course

Language of instruction

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

Intended learning outcomes

The overall aim is to provide a more deep understanding of the general fundamentals such as mass and energy balances, phase equilibria and kinetics. You will be able to relate these principles to some specific separation processes and even to generalize them to other separation processes. You will be able to find suitable solutions to real problems by using experience and judgment.

After the course you should be able to

-Identify proper separation methods for practical separation problems.

-Analyse a separation problem and suggest proper solutions to obtain an effective separation process or to improve an existing separation process.

-Solve different kind of separation problems.

-Describe and compare the different separation processes, their characteristics and applications.

-Explain how different variables, physical properties and momentum, heat and mass transport influence a specific separation process and what impact they have on the design of the equipment.

-Design simple separation equipment.

-Plan and perform laboratory experiment to support and evaluate or achieve solutions to a separation problem.

-Apply equilibrium equation for more complex separations in multicomponent system and nonideal systems.

Course contents

The course comprises fundamentals, basic requirements, and design principles for separation processes. Detailed descriptions and analyses of common unit operations are given. The fundamental mechanisms of phase equilibria and mass and/or heat transport and how the mathematical formulations of these mechanisms can be used in the design are also treated, as well as matters concerning the practical design of apparatus. The course also includes more empirical design methods, primarily for stage apparatus and continuous apparatus for common unit operations.

In an investigation assignment, the group is given a separation problem and is supposed to explore the basis for separation, analyse the most important features influencing the design, find the necessary data and make an adequate description of the design. In one experimental laboratory exercises the group is to plan an experimental programme to solve a given problem, perform experiments and analyse their results.

Course literature

Coulson & Richardson´s Chemical Engineering Vol. 1, 6th Ed. and Vol. 2, 5th Ed., Butterworth-Heinemannn, Course compendium.

Examination

- ANN1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Passed written examination, 4,5 credits, passed separation exercise, 3 credits, and passed laboratory exercise, 1,5 credits.

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.