KH1130 Chemical Engineering and Technology 1 7.5 credits

Kemiteknik 1

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

Establishment

Course syllabus for KH1130 valid from Spring 2019

Grading scale

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

Education cycle

First cycle

Main field of study

Chemistry and Chemical Engineering, Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A.

Completion of upper-secondary school from 1 July 2011 and adult education at upper-secondary level from 1 July 2012 (Gy2011)

General entry requirements and Specific entry requirements: Physics 2, Chemistry 1 and Mathematics 3c. A pass in each of the subjects is the lowest acceptable grade.

Completion of upper-secondary school before 1 July 2011 and adult education at upper-secondary level before 1 July 2012

General entry requirements and specific entry requirements: Mathematics D, Physics B and Chemistry A. The grade Passed or 3 in each of the subjects is required.

Language of instruction

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

Intended learning outcomes

The main gole of the course is that the student will be able to design equipment for fluid flow and heat exchangers.

When you have passed the course you will be able to:

• apply the continuity equation, momentum equation and energy balance (Bernoulli equation) for the calculation of flowing fluids

• describe characteristics of laminar and turbulent flow

• calculate the Reynolds number for flow

• describe and characterize some common flowmeters

• calculate pressure drop for flow in circular and non-circular pipes and in porous bed

• calculate the energy used for flow in valves and pipe components

• use pump and system characteristics to calculate the power requirement for a pump transporting liquids

• describe the concept of cavitation and NPSH calculation for a flow system

• describe common types of pumps and their properties

• study operating conditions for a fan in the transport of gas

• describe characteristics of different types of fans

• calculate heat flow by conduction, convection and radiation

• calculate required area for heat transfer in a heat exchanger

• describe and characterize the properties of common heat exchangers

• use software to modell simple systems in chemical engineering and evaluate the results

• reflect about different calculating strategies for chemical engineering problems

Course contents

Basic equations of fluid mechanics.Flow studies. Applications of pressure drop calculation, flow measurement, pumps and fans. Flow in porous beds.Heat transfer by conduction, convection and radiation.Heat exchangers.

Course literature

McCabe, W. L., Smith, J. C. and Harriott, P., Unit Operations of Chemical Engineering, 7th ed., McGraw-Hill, New York, 2005

Examination

- TEN1 - Examination, 6.0 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 examination (TEN1; 6 cr.).

Passed lab exercises, Matlab-excercise, ChemCad-excercise and active parcipitation in seminar(LAB1; 1,5 cr.).

The final grade is based on the grade of the written examination (TEN1).

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.