

SYLLABUS

Chemical Reaction Engineering I 7.5 credits T7008K

Kemisk reaktionsteknik I

Course syllabus admitted: Spring 2014 Sp 3 - Present

**DECISION DATE
2013-11-07**

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Kemisk reaktionsteknik I

Second cycle, T7008K

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Kemisk teknologi	Chemical Engineering

Entry requirements

90 credits in Chemical Engineering, including the courses M0031M Linear Algebra and Differential Equations, K0010K Physical Chemistry and B0003K Transport Processes.

Selection

The selection is based on 30-285 credits

Examiner

Danil Korelskiy

Course Aim

After completed course the student shall:

- have gained elementary knowledge in reaction engineering to enable the student to choose and dimension reactors for use in chemical processes. Further, the students should have acquired the theoretical background for determining the operational mode and optimization of these processes.
- be able to describe and explain the most common chemical reactors and their pros and cons.
- be able to mathematically express chemical reactors, limited to the topics covered in the course.
- be able to solve simpler reaction engineering problems using computer based tools such as Matlab.

Contents

Introduction to numerical methods and Matlab. Mass and energy balances, reaction kinetics, ideal batch, tank and tube reactors, adiabatic equilibrium processes, reactor capacity, pressure drop in chemical reactors, selectivity, yield and reactor stability.

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The teaching comprises lectures, tutorial sessions and a laboratory exercise.

In the lectures the most important parts of the theory of reaction engineering is presented. In the tutorial sessions, example problems are solved by the instructor.

Compulsory assignments are solved in smaller groups, aiming at practising the student in mathematical modelling of reactors/reactor systems as well as analysing the models. In the laboratory exercise the students are given the opportunity to practice written presentation, work in groups, independent problem solving and theory regarding chemical reactors.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. The examination comprise assignment problems, a laboratory exercise and a written exam. The grades pass or fail are given at the laboratory exercise and the assignment problems, these parts of the course are examined continuously during the course. For the written exam, the grades U (Failed), 3, 4 and 5, and in case of ECTS grades, F (Failed), Fx (Failed), E, D, C, B and A are given.

Remarks

Study guidance is available on Fronter in the corresponding room

Overlap

The course T7008K is equal to T0006K, T0002K

Literature. Valid from Autumn 2012 Sp 1

Fogler, S.H. Elements of Chemical Reaction Engineering, Latest edition, Pearson education.
Lab. instructions, assignment problems, etc. will be available for downloading from Fronter.

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

Number	Type	Credits	Grade
0001	Written exam	5.3	G U 3 4 5
0002	Laboratory work	0.7	U G#
0003	Assignment reports	1.5	U G#

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Eva Gunneriusson 2013-11-07

Syllabus established

by Eva Gunneriusson 2012-03-14