

**SYLLABUS**

# **Fundamentals of Chemical Reaction Engineering 7.5 credits T0006K**

**Grundläggande kemisk reaktionsteknik**

**Course syllabus admitted: Spring 2018 Sp 4 - Present**

**DECISION DATE  
2018-01-09**

# Fundamentals of Chemical Reaction Engineering 7.5 credits T0006K

## Grundläggande kemisk reaktionsteknik

### First cycle, T0006K

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

## Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and M0031M Linear Algebra and Differential Equations, K0010K Physical Chemistry and B0003K Transport Processes or corresponding courses. Good knowledge in English, equivalent to English 6

## Selection

The selection is based on 1-165 credits.

## Examiner

Johanne Mouzon

## Course Aim

The course is designed to provide you with basic knowledge of chemical reaction engineering. The main aim of the course is to introduce you to the fundamentals of reactor design.

At the completion of the course, you should be able to:

- have a general idea of reaction engineering;
- select and size reactors for use in a chemical process, and you should also be able to determine the operational mode and optimise the process;
- describe and explain the most common chemical reactors and their pros and cons;
- mathematically describe chemical reactors (limited to the topics covered in the course);
- 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-learning activities are comprised of 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 getting the student to practise mathematical modelling of reactors/reactor systems and analysing the models, and to develop oral presentation skills. In the laboratory exercise the students are given the opportunity to practise 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.

To complete the course you will need to:

- pass all assignments;
- attend the lab;
- pass the lab report;
- pass a written exam.

The grades pass or fail are given at the laboratory exercises and the assignments. These parts of the course are examined continuously during the course.

The exam is comprised of a number of theory questions and calculation problems. You will have 6 h to accomplish the exam. The exam is graded as U (failed, less than 50% done correct), 3, 4 and 5.

## Remarks

Study guidance is available on Canvas in the corresponding room

## Overlap

The course T0006K is equal to T7008K, T7010K

The course T7xxxK is equal to T7008K

## Literature. Valid from Spring 2018 Sp 3

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

## Course offered by

Department of Civil, Environmental and Natural Resources Engineering

## Items/credits

Number	Type	Credits	Grade
0001	Written Exam	4	TG G U 3 4 5
0002	Laboratory work	1	TG U G#
0003	Assignments	2.5	TG 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 Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2018-01-09

## Syllabus established

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2017-02-13