



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

## **Processimulering Process Simulation**

**KETN01, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED B/K

**Date of Decision:** 2023-04-18

### **General Information**

**Elective for:** B4-pt, K4-p, M BIO1, W4-p

**Language of instruction:** The course will be given in English on demand

### **Aim**

Simulation technique is a very important tool in process industry for advanced studies, such as analysis of operation condition changes and design of new processes. The course present a deepened skills and understanding of computer aided analysis and design of chemical processes. The course objective is to create opportunities for the student to become an competent user and commissioner of simulation technique through the presentation of possibilities, limitations and complexity by the technology.

### **Learning outcomes**

#### *Knowledge and understanding*

For a passing grade the student must

- be able to formulate advanced mathematical models for mass and energy transport in chemical processes.
- be able to estimate which numerical methods are suited for solution of different types of simulation problems

#### *Competences and skills*

For a passing grade the student must

- be able to formulate advanced computational problems and solve these with tools for technical computing.
- be able to present computational projects written, oral and interactive

### *Judgement and approach*

For a passing grade the student must

- be able to estimate and value models validity, application and its computational complexity.
- be able to estimate and value the possibility of fruitful useageof mathematical models for process engineering problem solving

## **Contents**

The course presents the formulation of mathematical models with companion numerical method for the solution of steady-state and dynamic lumped descriptions together steady-state and dynamic distributed descriptions. Elementary programming techniques to abstract and structuring for increased usage of computer based tools with graphical interface.

The course theory and methods are applied on a simulation project which is divided into a set of subtasks. The project is performed in group of two or three students. The course is based on integrated lectures and computer exercises under the first part. The second part of the course is dominated by independent project work. The course ends with an internal conference.

## **Examination details**

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Examination through a set of subtasks, presented written and oral.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

## **Admission**

**Assumed prior knowledge:** KETF01 Transport Phenomena, Basic Course and KETF10 Separation Processes, Basic Course or KETF40/KTE170 Mass Transfer Processes in Environmental Engineering

**The number of participants is limited to:** No

**Selection:** Credits remaining for the degree.

**The course overlaps following course/s:** KAT061

## **Reading list**

- Process Simulation. Department of Chemical Engineering, 2024.

## **Contact and other information**

**Course coordinator:** Niklas Andersson, [niklas.andersson@chemeng.lth.se](mailto:niklas.andersson@chemeng.lth.se)

**Course homepage:** <https://www.ple.lth.se/en/>