



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Separationsprocesser **Separation Processes, Basic Course**

KETF10, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED B/K

Date of Decision: 2023-04-18

General Information

Main field: Technology.

Compulsory for: B2, K2

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

Aim

Choosing and designing separation processes is of vital importance for product quality, energy demand, economy as well as for the environmental impact for many industries.

The aim is to give basic knowledge of the physical-chemical basis for different separation methods and to apply these for selection and design of industrial separation processes

Learning outcomes

Knowledge and understanding

For a passing grade the student must

for a given mixture of substances be able to judge what separation processes are reasonable based on available physical and chemical properties for those substances

for some different separation processes be able to explain how different parameters affect the capacity, degree of separation and for thermal separation processes also how the energy efficiency is affected

Competences and skills

For a passing grade the student must

be able to combine mass and energy balances with phase equilibria or design of various

separation processes comprising equipment size, capacity, degree of separation and energy efficiency

individually as well as through cooperation with other student(s) be able to solve given, limited separation problems and then present such solution orally and in writing

Contents

The following issues are treated:

- The physical-chemical principles for a number of separation processes. For some of these separation processes only basic principles are treated while some processes are treated in more detail.
- Principles for selection of separation process.
- Methods for determination of important design parameters and degree of separation for the following separation methods: filtration, membrane filtration, evaporation, distillation, adsorption/chromatography and drying.
- Methods for determining energy demand for evaporation, distillation and drying.

Examination details

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

Assessment: Written examination, project assignments, laboratory assignments and oral presentations. The grade is based on the written examination.

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.

Parts

Code: 0109. **Name:** Lab/Projects.

Credits: 3. **Grading scale:** UG. **Assessment:** Active participation in projects and laboratory assignments. Oral presentation and written reports. **Contents:** Laboratory and project assignment

Code: 0209. **Name:** Examination.

Credits: 4,5. **Grading scale:** TH. **Assessment:** Written examination **Contents:** The complete course

Admission

Assumed prior knowledge: KETF01 Transport Phenomena, Basic Course

The number of participants is limited to: No

The course overlaps following course/s: KAT030, KAT031

Reading list

- M Alveteg (editor): Introduction to transport phenomena and separation processes. MediaTryck, 2022. Version history published on course web for those who considers buying earlier edition/a used copy.
- M Alveteg (editor): Handbook, Physical properties, correlations and equations in chemical engineering. MediaTryck, 2021. Updated yearly by Dept Chemical Engineering, version history is available.
- M Alveteg: Diagrams & support for note taking. MediaTryck, 2023. Made available as

pdf but is usually also printed by MediaTryck. Printouts of diagrams is required for graphical solutions of exercises.

Contact and other information

Course coordinator: Universitetslektor Mattias Alveteg, Mattias.Alveteg@chemeng.lth.se

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