



Faculty of Health, Science and Technology  
Chemical Engineering

# Syllabus

## Separation Processes

<b>Course Code:</b>	CKGB55
<b>Course Title:</b>	Separation Processes <i>Separationsprocesser</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

**Major Field of Study:**  
KTA (Chemical Engineering)

### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2018-09-26, and is valid from the Spring semester 2019 at Karlstad University.

### Prerequisites

Completed 90 ECTS credits of the Master of Science Engineering Programme, including completed basic course in thermodynamics 7.5 ECTS and heat and mass transfer 7.5 ECTS cr, or equivalent.

### Learning Outcomes

Upon completion of the course, students should be able to:

- use material and energy balances as tools for analysing chemical engineering systems without chemical reactions,
- explain the most common unit operations and give examples of industrial processes in which each of the operations occur,
- apply the concept of phase equilibrium to the respective unit operation,
- describe the design of the equipment for performing the respective unit operation,

- propose the design and dimensioning of new process equipment and evaluate the efficiency of existing process equipment,
- calculate the energy consumption of the thermal separation processes distillation, evaporation and drying, and predict the consequences of the different process designs for energy engineering.

### **Content**

The course aims to introduce the most common unit operations in the chemical engineering industry, their application areas, how they are dimensioned, and the physical/chemical principles on which they are based. Methods of calculating design parameters for equipment and degree of separation for the following separation methods are included: filtration, evaporation, distillation, absorption/chromatography, extraction and leaching. Methods for calculating the energy consumption of evaporation, distillation and drying are treated. The course also covers overview of process diagrams, material and energy flows as well as phase equilibrium.

Instruction is in the form of lectures, calculation exercises, and laboratory sessions.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on a written exam, mandatory attendance at laboratory sessions, and reports on laboratory sessions according to instructions and submitted within a given time frame.

### **Grades**

One of the grades Fail, 3 (Pass), 4 (Pass with Some Distinction), or 5 (Pass with Distinction) is awarded in the examination of the course.

### **Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

### **Course Certificate**

A course certificate will be provided upon request.

### **Additional information**

The course CKGB55 cannot be included in the same degree programme as CKGB4E and CKGB4A.

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.