



Faculty of Health, Science and Technology  
Chemical Engineering

# Syllabus

## Chemical Engineering

<b>Course Code:</b>	CKGAKT
<b>Course Title:</b>	Chemical Engineering <i>Kemiteknik</i>
<b>Credits:</b>	15
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has only upper-secondary level entry requirements (G1N)

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

### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2021-02-02, and is valid from the Autumn semester 2021 at Karlstad University.

### Prerequisites

General admission requirements and upper secondary level Mathematics 4, Physics 2 and Chemistry 1 (field-specific eligibility 9 or A9), or equivalent

### Learning Outcomes

The aim of the course is for students to acquire broad knowledge of chemical engineering branches and insight into the relevance of the concept of sustainable development.

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

1. outline several industrial chemical engineering processes and their conditions in terms of concepts such as raw material, product, unit process, resource efficiency and the market,
2. give an account of the most common principles of sustainable development,
3. give an account of the concept of industrial ecology and of similarities and differences in comparison with the natural cycles,

4. discuss sustainable development in industry in terms of its social, economic and ecological dimensions,
5. use basic material and energy balances as tools in the analysis of industrial systems,
6. act and work safely in a laboratory environment,
7. plan, carry out, evaluate and report laboratory work according to instruction within given time limits, and
8. deliver a structured oral presentation on the subject within given time limits.

## **Content**

### **Component 1:**

Introduction to common chemical engineering processes in for instance pulp and paper production, the pharmaceutical industry, oil refining, production of synthesis gas, processes of bulk and fine chemicals, production of polymers and biomass refinement.

### **Component 2:**

Sustainable development in industry, cycle and system thinking.

### **Component 3:**

Unit operations, systems, and basic material and energy balances applied to chemical engineering processes.

### **Component 4:**

Laboratory procedures, laboratory equipment and safety analysis. Practical laboratory work and report writing.

## **Reading List**

See separate document.

## **Examination**

Assessment is individual and based on hand-in assignments, oral presentations, a safety test, and participation in and presentation of laboratory sessions.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

## **Grades**

One of the grades Pass with Distinction (5), Pass with Some Distinction (4), Pass (3) or Fail (U) is awarded in the examination of the course, or for Engineering students one of the grades Pass with Distinction VG), Pass (G) or Fail (U).

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

The course CKGAKT cannot be included in the same degree programme as the courses CKGA1A, CKGB1A, CKGB4B or CKGB4A.