

# Chemical and Process Engineering

**Code:** CHEM3047

**Extent:** 20–25 cr

**Language:** English

**Professor in charge:** Marjatta Louhi-Kultanen

**Target group:** Master's students

**Application procedure:** Open for all students of Aalto University.

**Quotas and restrictions:** Please note, that in some courses the number of participants can be limited. Then major students (Chemical and Process Engineering) have the priority.

**Prerequisites:** While making your study plan, you should verify that you have the prerequisites needed for the courses.

## Objectives

Chemical Engineering is based on a multi-scale perspective to underlying physical and chemical phenomena in chemical processes. It starts with molecular level origins of relevant phenomena, explains how processing unit level models and design practices emerge from them, and further considers integrated chemical plants and ultimately societal level effects. The emphasis is to educate engineers with a deep perspective on how natural sciences are applied with best engineering practices in Chemical Process Industries.

The graduates of this minor are capable of being active members in a team of chemical processing experts, supporting the team with their own competence, and actively communicating with other process technology experts.

## Learning outcomes

Core scientific and engineering knowledge (emphasis of these depends on the student's interests and course selections):

1. Knowledge of transport phenomena (heat, mass and momentum transfer) and unit operations in chemical processing.
2. Knowledge of chemical reaction kinetics and catalysis in various fields related to chemical process industries.
3. Knowledge about applied thermodynamics, phase equilibrium and physical property calculations, and their relation to conversion and separation process design.
4. Understand process dynamics, automation and control, and their connection to process design and integration.

## Content and structure of the minor

For the minor (20–25 credits) the students have to take compulsory studies 15–25 cr from Chemical Engineering major's compulsory courses. (NB! Not CHEM-E7170 Design project part A, CHEME7180 Design project part B or CHEM-E7120 Lab project.) Additionally the student needs to select specialisation studies of 0–10 cr. Please check the list below.

### Structure of the minor

Code	Name	Credits	Period
Mandatory courses		15–25	
<a href="#">CHEM-E7100</a>	Engineering Thermodynamics, Separation Processes, part I	5	I
<a href="#">CHEM-E7110</a>	Engineering Thermodynamics, Separation Processes, part II	5	II
<a href="#">CHEM-E7130</a>	Process Modeling	5	II
<a href="#">CHEM-E7140</a>	Process Automation	5	I
<a href="#">CHEM-E7150</a>	Reaction Engineering	5	II
<a href="#">CHEM-E7160</a>	Fluid Flow in Process Units	5	I V - V
Elective courses		0–10	

---

Choose so many courses below that the Minor will be at least 20 cr

CHEM-E7105	Process Development	5	I- II
CHEM-E7115	Experimental Assignment in Chemical Engineering	5	I- II, III - IV
CHEM-E7135	Reactor Design	5	III - IV
CHEM-E7155	Production Planning and Control	5	I- II
CHEM-E7165	Advanced Process Control Methods	5	III
CHEM-E1130	Catalysis	5	III - IV
CHEM-E2145	Polymer Reaction Engineering	5	III - V

---