

CH-407

Sustainable chemistry and engineering in Industry

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Cursus	Sem.	Type
Chemistry and Chemical Engineering		Obl.
Chimiste	MA1, MA3	Opt.
Ing.-chim.	MA1, MA3	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
Hours	2 weekly
Courses	2 weekly
Number of positions	

Summary

In the course given by experts from the Swiss Chemical industry, the students will be introduced in key concepts of sustainable chemistry and chemical engineering of industrial relevance. They will be able to learn from real hands-on problems and to better understand the challenges faced in industry

Content

1 Key aspects of sustainability in industry

1.1 Health, Safety and Environment and their importance on sustainability for the industry.

1.2 Green metrics: real-life tools used during design phase and at the portfolio level

1.3 The proper choice of technology and their impact. Chemo-, bio-, photo-, hybrid-catalytic processes, flow

2 Case studies

2.1 Fragrance industry

2.2 Agrochemical industry

2.3 Pharmaceutical industry

2.4 Bulk chemical industry

Keywords

sustainability

green chemistry

industry

Learning Prerequisites**Required courses**

Bachelor level in chemistry or chemical engineering.

Learning Outcomes

By the end of the course, the student must be able to:

- Analyze the aspects of Health, Safety and Environment in the production and use of chemicals
- Apply green metrics for the analysis of chemical processes
- Analyze the impact of different technologies to choose the most sustainable alternative
- Apply tools for the sustainable synthesis of chemicals
- Analyze case studies from the Swiss Chemical Industry

Transversal skills

- Access and evaluate appropriate sources of information.
- Make an oral presentation.

Teaching methods

power point presentation with workshops, case studies and group works

Expected student activities

ctive participation to the lecture, workshops, case studies and group works

Assessment methods

during the semester, graded assignments for each session

Resources

Moodle Link

- <https://go.epfl.ch/CH-407>