

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
Lecture	2 weekly
Number of positions	

Summary

Experts from the Swiss Chemical industry, will be introducing key concepts of sustainable chemistry and chemical engineering of industrial relevance. Students will be able to learn from real hands-on problems and better understand the challenges faced in industry and work towards their resolution.

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

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
- 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

active participation to the lecture

Assessment methods

Continuous control: graded short exam or homework given at each session

Supervision

Assistants	No
Forum	Yes

Resources

Bibliography

power point presentation of the lecturer + extra material depending on program

Notes/Handbook

Detailed Schedule for Fall 2023

The course takes place every second Thursday, from 11 to 13 and 14 to 16.

21.09.2023: Dr. Annik Nanchen, TUV Sul#d

<https://www.linkedin.com/in/annik-nanchen/>

Safety and Health and their importance for sustainability

5.10.2023: Dr. Fabrice Robvieux, DSM-Firmenich

Green metrics: Real life tools

19.10.2023: Dr. Cara Blocklehurst, Novartis

<https://www.linkedin.com/in/cara-brocklehurst-37154164/>

The proper choice of technology and their impact

2.11.2023: Dr. Fabrice Robvieux, DSM-Firmenich

Case study from the fragrance industry

16.11.2023: Dr. Edouard Godineau, Syngenta

<https://www.linkedin.com/in/edouard-godineau-a2411214b/>

Case study from the agrochemical industry

30.11.2023: Dr. Pierdomenico Biasi, Casale SA

<https://www.linkedin.com/in/pbiasi/>

Case study from the bulk industry

14.12.2023: Dr. Lucie Lovelle, Novartis

<https://www.linkedin.com/in/lucie-lovelle-1527a245/>

Case study from the pharmaceutical industry

Moodle Link

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