

Master in Life Sciences

A cooperation between
BFH, FHNW, HES-SO, ZFH

Module title	Green Chemistry
Code	C4
Degree Programme	Master of Science in Life Sciences
Group	Chemistry
Workload	3 ECTS (90 student working hours: 42 lessons contact = 32h; 58h self-study)
Module Coordinator	<p>Name: Dr. Jürgen Stohner Phone: +41 (0)58 934 54 93 Email: juergen.stohner@zhaw.ch Address: ZHAW Life Sciences and Facility Management, Einsiedlerstrasse 31, 8820 Wädenswil</p>
Lecturers	<ul style="list-style-type: none"> • Dr. Achim Ecker, ZHAW • Dr. Christian Frech, ZHAW • Guest Lecturer
Entry requirements	Basic knowledge in chemistry on the level of a BSc Degree in Chemistry.
Learning outcomes and competences	<p>After completing the module, the students are able to:</p> <ul style="list-style-type: none"> • evaluate the sustainability of industrial chemical and bio-chemical processes using different perspectives • explain the different steps of the supply chain (from raw materials to the products end of life) and their impact on sustainability • consider environmental, economic as well as social aspects in their assessment of industrial processes
Module contents	<p><u>From Sustainability to Green Chemistry Metrics</u></p> <ul style="list-style-type: none"> • History of sustainability • The chemical industry • 12 Principles of Green Chemistry • Green Chemistry Metrics <p><u>Industrial Green Chemistry</u></p> <ul style="list-style-type: none"> • The fine chemical industry • Green manufacturing concepts and their ecological impact • Green supply chain • Greenness vs. cost & capital investment <p><u>Solvent and Solvent systems</u></p> <p>Raw materials and environmental concerns are important and discussed as follows:</p> <ul style="list-style-type: none"> • Introduction to solvents and solvent systems • Sustainable raw materials: evaluation/selection of green processes • Potential chemicals derived from sustainable raw materials (including processes to get these chemicals) • Ethanol production from crops (corn, sugar cane, wheat etc.), methyl-THF, etc. • Alternative green solvents and chemicals

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Teaching / learning methods	<ul style="list-style-type: none">• Lectures• short seminars• presentations• case studies• exercises• demonstrations and self-study <p>When pre-readings and pre-course works are required, the students will be informed prior to the course.</p>
Assessment of learning outcome	1. Final examination; up to 12 students oral, from 12 or more students written exam (100%)
Format	7-weeks
Timing of the module	Spring semester, CW 8 - 14
Venue	Mix of online and on-site lectures (in Olten)
Bibliography	Will be announced at beginning of the lectures. Course material can be downloaded from the MSLS Moodle platform.
Language	English
Links to other modules	This module serves as basic course to the spring semester specialisation module "Green Chemistry – Advanced Concepts" at ZHAW.
Comments	
Last Update	23.09.2021