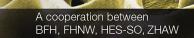
Master in Life Sciences

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

Module title	Polymers and Applications							
Code	C3							
Degree Programme	Master of Science in Life Sciences							
Group	Chemistry							
Workload	3 ECTS (90 student working hours: 40 lessons contact = 30 h; 60 h self-study)							
Module	Name: Prof. Roger Marti							
Coordinator	Phone : +41 (0)26 429 67 03							
	Email: roger.marti@hefr.ch							
	Address: Haute école d'ingénierie et d'architecture Fribourg, Perolles 80, 1700 Fribourg							
Lecturers	Prof. Olivier Nicolet, HEIA-FR							
	 Prof. Roger Marti, HEIA-FR 							
	Prof. Hans-Ulrich Siegenthaler, iRAP Institute of Applied Plastics Research, HEIA-FR							
	Prof. Dominik Brühwiler, ZHAW							
	Guest lecturers & experts from industry							
Entry requirements	Chemistry at Bachelor of Science level.							
	Knowledge required in: Organic chemistry (reactivity of carbonyl and carboxylic acid							
	derivatives, radical reactions) & Analytical and physical chemistry (spectroscopy,							
	thermal analysis, chromatographic methods).							
	Preparatory reading will be made available on Moodle.							
-	See also information under "comments"							
Learning outcomes	After completing the module, students will be able to:							
and competences	 design and execute typical synthetic methods for the preparation of polymers 							
	select appropriate analytical and physico-chemical methods to analyze and							
	characterize polymers							
	work with inorganic polymers and biopolymers and use them for applications							
	 explain polymer processing and industrial application of polymers 							
Module contents	Synthesis of polymers (Chain-growth and step-growth polymerization)							
	Chemical Post-Polymerization Modifications							
	Characterization of polymers							
	Biopolymers and "Bio"-Plastics							
	Environmental impact of plastics							
	Inorganic & electronic polymers							
	Polymers processing							
Teaching / learning	Industrial applications							
Teaching / learning methods	Basic concepts and theoretical backgrounds by lecturers							
methous	Inputs by guest lecturers from industry and academia							
	Exercises and analysis of case studies							
	Lab visits with hands-on demonstration							
Assessment of	1. Written exam (closed book), final (100%)							
learning outcome								
Format	Winter school							





Timing of the	Autumn semester, CW6									
module										
	Day of the block week	<1	1	2	3	4	5	>5		
	Contact teaching (lessons)		8	8	8	8	8			
	Self-study (hours)	20	2	2	2	2	2	30		
Venue	Fribourg									
Bibliography	Chada & Roy: "Industrial Polymers, Specialty Polymers, and their Applications" CRC Press 2009 Carraher: "Introduction to Polymer Chemistry" CRC Press 2011 Campbell, Pethrick & White: "Polymer Characterization: physical techniques" CRC Taylor & Francis 2000 Mark, Allcock & West: "Inorganic Polymers" Oxford University Press 2005 Lectures notes (PDF) and additional material (exercises) will be delivered in addition during the module.									
Language	English									
Links to other	Coordination with modules C1 "Materials Science", C2 "Surface Characterisation", C4									
modules	"Green Chemistry" and C5 "Chemistry and Energy".									
Comments	 There is a participant limit in this module. Registrations will be considered as follows: 1. Students for whom C3 is a compulsory module 2. Students from the Chemistry-Cluster 3. Students who need the ECTS for the graduation in the semester concerned 4. The remaining places will be drawn by lot Whether participation is possible will be communicated by the end of week 37. 									
Last Update	20.02.2025									