Master in Life Sciences

Module title	Physicochemical Principles in Pharmaceutics
Code	BP8
Degree Programme	Master of Science in Life Sciences
Group	Bio/Pharma
Workload	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
Module	Name Oliver Germershaus
Coordinator	Phone 061 228 55 26 Email <u>oliver.germershaus@fhnw.ch</u>
	Address FHNW, HLS, Hofackerstrasse 30, 4132 Muttenz
Lecturers	Georgios Imanidis
	Martin Kuentz
Entry requirements	Bachelor level in pharma technology, pharmaceutics, and/or chemistry and physical
	chemistry
Learning outcomes	After completing the module, students will be able to
and competences	 fundamentally understand principles underlying design of drug delivery systems
	 define and solve challenges related to colloidal systems for pharmaceutical
	application
	 implement interfacial phenomena, solubility theory into pharmaceutical product
	design
	 apply properties of solid and semi-solid materials to delivery system development
	 define types and applications of polymers in a pharmaceutical context and know
	key properties and characterization approaches of/for polymers
Module contents	 Interfacial phenomena, micromeritics and compaction (Georgios Imanidis, 14 lessons) Interfacial Phenomena / Surfactants: multi-phase systems, liquid-liquid, liquid-air, liquid-solid interfaces. adsorption, Gibbs equation, Langmuir isotherm, wetting, spreading. Applications in drug formulation, and delivery
	 Micromeritics & Compaction: Compressibility, compatibility, manufacturability, tablettability, material properties of powders and compacts and relationship to process and product quality, manufacturing challenges of solid and semi-solid preparations
	Solutions, computational modelling, rheology (Martin Kuentz, 14 lessons)
	 Solutions and structured liquids including solid solutions and deep eutectics.
	Computational modeling & property prediction (e.g. solubility and partitioning)
	 Rheology: elastic/plastic behavior, viscoelasticity, thixotropy, measurement
	principles and systems
	Pharmaceutical nanotechnology and polymers (Oliver Germershaus, 14 lessons)
	 Pharmaceutical nanotechnology and polymers (oliver Cermershaus, 14 lessons) Pharmaceutical nanotechnology and colloidal systems: types of colloidal systems:
	optical, kinetic and electrical properties of colloids: stabilization of colloidal
	systems; pharmaceutical application of colloids
	Pharmaceutical polymers: polymer types, polymer properties and characterization.
	pharmaceutical application of polymers
Teaching / learning	lecture, student presentations, group work, practical exercise
methods	

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Assessment of	Closed book examination (100 %)
learning outcome	
Format	7-weeks
Timing of the	Autumn semester, CW 45-51
module	
Venue	Blended learning format. Presence sequences take place in Olten
Bibliography	Sinko: Martins Physical Pharmacy and Pharmaceutical Sciences
	Florence, Attwood: Physicochemical Principles of Pharmacy
	Kim: Advanced Pharmaceutics, Physicochemical Principles
Language	English
Links to other	-
modules	
Comments	-
Last Update	17.04.2025