

# Master in Life Sciences

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

<b>Module title</b>	<b>Physicochemical Principles in Pharmaceutics</b>
<b>Code</b>	BP8
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	Bio/Pharma
<b>Workload</b>	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
<b>Module Coordinator</b>	<b>Name</b> Oliver Germershaus <b>Phone</b> 061 228 55 26 <b>Email</b> <a href="mailto:oliver.germershaus@fhnw.ch">oliver.germershaus@fhnw.ch</a> <b>Address</b> FHNW, HLS, Hofackerstrasse 30, 4132 Muttenz
<b>Lecturers</b>	Georgios Imanidis Martin Kuentz
<b>Entry requirements</b>	Bachelor level in pharma technology, pharmaceutics, and/or chemistry and physical chemistry
<b>Learning outcomes and competences</b>	After completing the module, students will be able to... <ul style="list-style-type: none"> <li>• fundamentally understand principles underlying design of drug delivery systems</li> <li>• define and solve challenges related to colloidal systems for pharmaceutical application</li> <li>• implement interfacial phenomena, solubility theory into pharmaceutical product design</li> <li>• apply properties of solid and semi-solid materials to delivery system development</li> <li>• define types and applications of polymers in a pharmaceutical context and know key properties and characterization approaches of/for polymers</li> </ul>
<b>Module contents</b>	<p><i>Interfacial phenomena, micromeritics and compaction (Georgios Imanidis, 14 lessons)</i></p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Micromeritics &amp; 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</li> </ul> <p><i>Solutions, computational modelling, rheology (Martin Kuentz, 14 lessons)</i></p> <ul style="list-style-type: none"> <li>• Solutions and structured liquids including solid solutions and deep eutectics. Computational modeling &amp; property prediction (e.g. solubility and partitioning)</li> <li>• Rheology: elastic/plastic behavior, viscoelasticity, thixotropy, measurement principles and systems</li> </ul> <p><i>Pharmaceutical nanotechnology and polymers (Oliver Germershaus, 14 lessons)</i></p> <ul style="list-style-type: none"> <li>• Pharmaceutical nanotechnology and colloidal systems: types of colloidal systems; optical, kinetic and electrical properties of colloids; stabilization of colloidal systems; pharmaceutical application of colloids</li> </ul> <p>Pharmaceutical polymers: polymer types, polymer properties and characterization, pharmaceutical application of polymers</p>
<b>Teaching / learning methods</b>	lecture, student presentations, group work, practical exercise



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<b>Assessment of learning outcome</b>	Closed book examination (100 %)
<b>Format</b>	7-weeks
<b>Timing of the module</b>	Autumn semester, CW 45-51
<b>Venue</b>	Blended learning format. Presence sequences take place in Olten
<b>Bibliography</b>	Sinko: Martins Physical Pharmacy and Pharmaceutical Sciences Florence, Attwood: Physicochemical Principles of Pharmacy Kim: Advanced Pharmaceutics, Physicochemical Principles
<b>Language</b>	English
<b>Links to other modules</b>	-
<b>Comments</b>	-
<b>Last Update</b>	18.04.2023