Module title	**Physicochemical Principles of Industrial Drug Delivery System Design**
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 Coordinator	**Name** Oliver Germershaus **Phone** 061 228 55 26 **Email** oliver.germershaus@fhnw.ch **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 and competences	After completing the module, students will be able to… • 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 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 methods	lecture, student presentations, group work, practical exercise

Assessment of learning outcome	Closed book examination (100 %)
Format	7-weeks
Timing of the module	Autumn semester, CW 45-51
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	21.04.2022