Module title	**Drug Formulation and Delivery for Solid Dosage Forms**
Code	BP2
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**: Dr. Georgios Imanidis **Phone**: +41 (0)61 228 56 36 **Email**: georgios.imanidis@fhnw.ch **Address**: School of Life Sciences - FHNW, Institute of Pharma Technology, Gründenstrasse 40, 4132 Muttenz
Lecturers	• Dr. G. Imanidis, School of Life Sciences - FHNW • Dr. M. Kuentz, School of Life Sciences - FHNW • Dr. T. Guentert, Private consultant (ex. Roche), Böckten
Entry requirements	Bachelor's Degree in Life Sciences (or equivalent) in Pharma Technology, Chemistry, Process Technology, or Food Technology. Preparation of the topic "basic pharmacokinetics" is essential, including the self-test on Moodle. In addition, study of relevant literature.
Learning outcomes and competences	After completing this module, students: • know the formulation strategies for poorly water-soluble active pharmaceutical ingredients, • know formulation concepts of solid dosage forms for per-oral drug delivery, • understand the principles and mechanisms of controlled drug release and delivery, • can evaluate the blood plasma concentration profiles and therapeutic effects of controlled drug delivery based on pharmacokinetic principles, • can develop pharmaceutical dosage forms (after acquiring relevant practical experience), • are able to work in interdisciplinary teams of drug development.
Module contents	Controlled release technologies: Fundamentals of controlled release and examples thereof; theory of drug diffusion, kinetics, crystals, particles, membrane & matrix systems, hydrogels, lipogels, multi-phasic, swellable, erodable, biodegradable, monolithic/particulate, micro-/nano-particulate, osmotic, stimuli responsive systems, devices, pumps, eluting stents. Per-oral drug delivery and formulations of poorly water-soluble drugs: Intestinal absorption, models, theory of solubility, principles of solubilization, the requirement for the active ingredient and formulation technologies including lipid-based, solid dispersion and particulate systems. Biopharmaceutical modeling and simulation: Basic principles and application of LADME in time-controlled delivery; physiological transport, pharmacokinetic models, compartmental and physiologically based modeling, pharmacokinetic profile for different drug delivery kinetics, data analysis exercises.

Teaching / learning methods	Lecture, theoretical workshop, literature search, computer modelling exercises
Assessment of learning outcome	1. Written final examination, closed book (100%)
Format	7-weeks
Timing of the module	Autumn semester, CW 45-51
Venue	Olten and/or online
Bibliography	D.L. Wise: Handbook of Pharmaceutical Controlled Release Technology M.J. Rathbone, J. Hadgraft, M.S. Roberts, M.E. Lane: Modified-Release Drug Delivery Technology, Volume 1 & 2 M. Grassi et al.: Understanding drug release and absorption mechanisms M. Rowland & T.N. Tozer: Clinical pharmacokinetics - concepts and applications S.A. Peters: Physiologically based pharmacokinetic (PBPK) modeling and simulations - principles, methods, and applications in the pharmaceutical industry
Language	English
Links to other modules	Specialisation module FHNW “Formulation of biologics and routes of drug delivery”
Comments	The homework assignments can be used to round up the grade in the respective part of the exam.
Last Update	31.03.2021