

Department	06 Applied Sciences and Mechatronics
Course title	Microfluidics and Applications
Hours per week (SWS)	4
Number of ECTS credits	6
Course objective	(1) Extend and acquire understanding in physics of fluids for both internal and external flows, (2) Understand the function, design and manufacturing of micro fluidic devices (3) Get acquainted with practical implementations of microfluidics in selected application
Prerequisites	Fundamentals of physics and mathematics corresponding to B.Sc. or B.Eng., fundamentals in microtechnology are helpful but not necessary
Recommended reading	Will be given at the end of the first lecture. Example: Nguyen Nam-Thung: "Fundamentals and applications of microfluidics"
Teaching methods	Lecture with integrated problems, solutions and questions
Assessment methods	Final exam
Language of instruction	English
Name of lecturer	Dr. Karin Bauer and Dr. Gerhard Müller
Email	ka.ba@t-online.de
Link	https://www.fb06.fh-muenchen.de/fk/modulbeschreibungen.php?lang_nr=&id=2010
Course content	(1) Introduction, classification of fluids, basics in thermodynamics and transport phenomena (diffusion, heat transport, viscosity), surface tension, Navier-Stokes equations, Reynolds number, laminar and turbulent flows, fluidic networks, elektrofluidics (optional), (2) Microchannels, microvalves, micromixers and microreactors, micropumps, (3) Microdosing, microarrays & biochips, micro total analysis systems (μ TAS), aero-mems (optional)
Remarks	