Courses in English
Course Description

Department	06 Applied Sciences and Mechatronics
Course title	**Physical Modeling and Simulation**
Hours per week (SWS)	4
Number of ECTS credits	6
Course objective	Methods, numerical techniques and software (Comsol) to model physical systems in the field of micro- and nanotechnology, photonics and biotechnology
Prerequisites	solid background in physics
Recommended reading	Roger W. Pryor, Multiphysics Modeling Using COMSOL 5 and MATLAB, 2017 Mercury Learning and Information 2017
Teaching methods	2 SWS lecture and 2 SWS computer lab class
Assessment methods	combined computer and written examination
Language of instruction	English
Name of lecturer	Prof. A. Kersch
Email	akersch@hm.edu
Link	http://www.fb06.fh-muenchen.de/fb/index.php/de/vita.html?staffid=571
Course content	Introduction to Finite Element Methods (FEM) to the solution of partial differential equations in physics together with the main numerical methods (solvers for stationary, transient and eigenvalue problems as well as for systems of linear equations). Account of the following areas of physics in terms of multi-physics simulations: heat and mass transfer and fluid dynamics and chemical reactions, theory of elasticity, multiphase systems, static electric and magnetic fields and interaction with matter, electrodynamics, wave optics.In the internship there is introduction into the simulation program Comsol Multiphysics together with the modules to Multiphysics, AC / DC, RF MEMS, and for static and dynamic fields and wave optics, as well as the connection to Matlab. The number of examples in this part is relevant for all study programs. The second part of the semester, the exercises are challenging and are adapted to the study programs.
Remarks	http://www.fb06.fh-muenchen.de/fb/index.php/de/masterstudium/mnm/studieninhalte.html?ItemID=&id=82&code=MNM350