Department	06 Applied Sciences and Mechatronics
Course title	**System Modelling and Machine Learning**
Course number	MNM210
Hours per week (SWS)	4
Number of ECTS credits	6
Course objective	After introduction into system models based on equations with concentrated parameters implemented in Python Jupyter Notebooks, the focus turns to the description with data-based modelling. The course introduces into the most important methods of kernel based machine learning and neural network based deep learning to model systems in form of supervised and unsupervised learning with Python based libraries. The gained knowledge is deepend with a simulation study project.
Prerequisites	Bachelor in physics or engineering, basic knowledge in Python
Recommended reading	D. Osinga, Deep Learning Cookbook, O'Reilly 2018, J. Frochte, Maschinelles Lernen: Grundlagen und Algorithmen in Python, Hanser 2021
Teaching methods	seminaristic teaching using Jupyter Notebooks, simulation study in small team with written report
Assessment methods	40% written exam 90', 60% written report
Language of instruction	English
Name of lecturer	Prof. Dr. A. Kersch
Email	akersch@hm.edu
Link	https://sci-intern.hm.edu/fk/modulbeschreibungen.php?lang_nr=&id=652&lang=en
Course content	physical and mathematical modeling of systems, optimization and maschine learning, Python, own simulation study
Remarks	