Department 03 Mechanical, Automotive and Aeronautical Engineering

Course title Fundamentals of Computational Fluid-Dynamics

Hours per week (SWS) 4

Number of ECTS credits 5

Course objective #1 gain knowledge about simple flow models, incompressible without friction, potential flow theory and their mathematical classifications
#2 understand the use of modern CFD simulation tools, finite difference methods, transformation of a physical flow model into its discrete matrix representation
#3 implementation of self-created case files for modern CFD software usage and interpretation of the results
#4 gain an overview of relevant technical turbulence models

Prerequisites

Recommended reading

Teaching methods Course lecture and applied computer laboratory

Assessment methods Final Exam

This course is equivalent to M-SP4-2 "Grundlagen numerischer Strömungssimulation" in the Mechanical Engineering Bachelor of Science Degree program

Language of instruction English

Name of lecturer Prof. Dr. Björn Kniesner

Email bjoern.kniesner@hm.edu

Link

Course content #1 Mathematical analysis of physical flow processes
#2 Classical flow analysis
#3 Conservation of energy and mass in a discrete format
#4 Numerical approximations of analytical models
#5 Evaluation of different numerical solution methods
#6 Realisation of CFD computer models
#7 Numerical solutions of selected fluid dynamics phenomena
#8 Final CFD Fluid Flow project

Remarks