

Course Descriptions CiE

Course code:

MFB470 (FK06)

Course title :

Mechanism Design and Analysis

Hours per week:

4

Semester:

4 (from 3 to 8 available)

Number of ECTS Credits allocated/work load:

4

Course contents:

Introduction of mechanism design:

- modelling by rigid bodies and joints,
- discussion of topology as tree structures and closed loops,
- state variables and degrees of freedom (DOFs) of joints and system,
- transfer functions

Design of simple planar mechanisms, Introduction into parameter optimization

- slider crank, four-bar-mechanism

Kinematical analysis

- frames and orientation matrix,
- functions of position, velocity and acceleration,
- discussion of mechanism behaviour,
- graphical methods

Dynamical analysis

- equilibrium conditions,
- principle of virtual power,

Introduction to multibody programs

- demonstrations on examples

Prerequisites:

Mechanics I and II, Mathematics I and II, Computer mathematics, Modelling u. Simulation

Objective of the course/learning outcome:

Students will be able to

- understand the movement of mechanisms and to calculate the DOFs of a system
- setup the kinematical transfer functions of a planar mechanism
- calculate the applied forces and torques of the input links.

- design and parameterise simple mechanisms

Recommended Reading:

Wallrapp, O. (2008) Mechanism Design and Analysis, Manuscript FHM.

Kerle, H., R. Pittschellis, R. und Corves, B., (2007). Einführung in die Getriebelehre. Stuttgart, B.G. Teubner.

Erdman, A. and Sandor, G., (1984), Mechanism Design, Vol.I, Prentice Hall.

Teaching methods:

Lecture, exercises in groups, projects

Assessment methods:

Class Projects, Written Examination

Language of instruction:

English

Name of lecturer:

Oskar Wallrapp

Email:

wallrapp@hm.edu

Link:

http://www.fh-muenchen.de/fb06/professoren/wallrapp/d_vorlesung_mda.html