

Course Description – Mechanism Design and Analysis

Course title:	Mechanism Design and Analysis
Hours per week:	4
Number of ECTS / US Credits:	4
Semester:	4 (from 3 to 8 available)
Objective of the course:	Students will be able to <ul style="list-style-type: none">- 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
Prerequisites:	Mechanics I and II, Mathematics I and II, Computer mathematics, Modelling u. Simulation
Recommended reading:	<ul style="list-style-type: none">- Wallrapp, O. (2008) Mechanism Design and Analysis, Manuscript HM.- 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 Exam
Language of instruction:	English
Name of lecturer:	Oskar Wallrapp

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

Time:

Course content:

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