Focus Specialization
Design, Mechanics and Manufacturing

Focus Description

The Focus Specialization in *Design, Mechanics and Materials* is a general Mechanical Engineering specialization with wide applicability to a range of diverse domains from biomedical to transport (automotive, aerospace, space, and rail), advanced manufacturing including additive manufacturing, product development, robotics, sports, energy systems, and even buildings. The engineering design and evaluation of mechanical and mechatronic systems is one of the main tasks of a mechanical engineer. The focus, thus, optimally bridges the Bachelor curriculum by preparing students for a wide variety of subsequent Master studies. It aims to broaden and strengthen the main fundamentals in Mechanical Engineering by introducing state-of-the art methods and tools in engineering design, theoretical, computational and experimental mechanics, materials and manufacturing, and new technologies. This knowledge will enable students to design, analyze, simulate, optimize, and test modern mechanical and mechatronic systems.

Course Selection

In order to achieve the required 20 credit points for the Focus Specialization Design, Mechanics and Manufacturing, you are free to choose any of the courses offered in the focus. One course in addition to those listed under the focus specialization can be chosen but requires approval by the focus coordinator. If you wish to take a Master level course, you must obtain approval from the lecturer.

Focus Coordinator: Prof. Dr. Dennis M. Kochmann (LEE N 201, dmk@ethz.ch)

Recommended Courses

- **Design** (contact: Prof. Dr. Kristina Shea) &
  Manufacturing (contact: Prof. Dr. Markus Bambach):

  If you are interested in specializing in design and/or manufacturing, there is no specific recommendation; you choose from the full list of offered electives and focus electives.

- **Mechanics** (contact: Prof. Dr. Dennis M. Kochmann):

  If you are interested in specializing in mechanics, the following is a list of recommended courses (note that this is a recommendation, not a mandatory course list):

  General Electives: Introduction to Computing; Introduction to Finite Element Analysis; Leichtbau

  Focus Electives: Continuum mechanics 1 & 2; Advanced Dynamics; Experimental Mechanics; Optimization and ML