Virtual Process Design
(Focus: Metal Forming and Casting)

Lecture in Winter Term 2020/2021, 5ECTS, 3SWS

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Content
The aim of the course "Virtual Process Design (Focus: Metal Forming and Casting)" is to present the most important concepts of virtual methods and simulation in the design of industrial manufacturing processes, with particular regard to the fields of metal forming and casting.

In the first part of the lecture, the fundamentals, motivation and history of simulation are reviewed in detail. In particular, the basics of the finite element method (FEM) are addressed along with the definition of the constitutive law and the failure behaviour of metals. In addition, an overview of material characterization methods for metal forming, cutting and casting is presented.

The second part of the lecture deals with the application of the presented virtual methods to typical industrial problems. The workflow of the forming, cutting and casting simulation are presented and different industrial standard tools are shown.

The course is completed by some exercise sessions and guest lectures from simulation experts from the industry.