

Technische Universität Chemnitz · 09107 Chemnitz

To
all students in the lecture
"Modelling and Idealisation in Manufacturing Simulation"
in the 2026/2027 winter semester

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Ort, Datum: Chemnitz, 02.10.2026

Dear students of the lecture "Modelling and Idealisation in Manufacturing Simulation",

Manufacturing processes are complex multi-physical processes, which are used for producing components with defined geometries and properties. Hence, the complexity of manufacturing processes results from the interplay of various domains of physics, such as mechanics, dynamics, and thermodynamics. Simulation tools are playing an increasingly important role in this context. They have become indispensable for the planning and optimization of manufacturing processes. The first step in simulating these processes is modeling and idealization. This first step is examined in this module and divided into four parts.

In Part IV of the module, the computer-aided modeling of multi-body systems based on the basic elements of rigid bodies, nonlinear springs and viscous dampers is introduced. Numerical examples will be implemented from scratch. In the lectures, the physical problems are modelled by mathematical equations. The aim of the exercises then is the discretization of the mathematical equations derived in the lecture. The exercises also include laboratories in which the computational implementation of the discrete equations by means of a programming language is performed.

Course details are as follows:

Lecture: 2 contact hours
Tutorial: 2 contact hours
Exam: 120-minute written exam (5 ECTS credits)
Semester: Offered every winter semester
Lecture times: Tuesdays, 15:30 – 17:00, Room 2/N115 (C10.115)

The lecture is based on a set of notes ([see homepage](#)). Additional literature is as follows:

- Peter Wriggers: Nonlinear finite element methods
- Stuart S. Antman: Nonlinear problems of elasticity

