

Module Name	Multi Body Systems Advanced
Module Number	EuI-MT-E-M01V
Responsible Lecturer	Prof. Dr.-Ing. Michael Beitelschmidt dynamik.u.mechanismentechnik@tu-dresden.de
Qualification Objectives	After completing the module, students master the methodological fundamentals for solving control engineering tasks, understand the basics of coupled simulation and real-time simulation, and are able to implement controllers for simple systems. Students can work with a commercial multibody simulation (MBS) program, specifically to independently create models, perform simulation calculations, and prepare and interpret results.
Contents	The module deepens the methods of multibody simulation to calculate large motions of mechanical systems consisting of rigid and elastic bodies in the time domain. This established method is used in general mechanical engineering, as well as in the automotive and aerospace industries. For mechatronic applications, coupling with control engineering, simulation models of other physical domains, and real-time simulation is also required.
Teaching and Learning Forms	3 hours per week of lectures, 3 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Software Engineering Basics, Control Engineering, Discrete Event Systems and Control, and Multi Body Systems Basics are required.
Usability	The module is an elective module in the elective area "Methods and Applications" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the diploma program Mechatronics. It creates the prerequisites for the modules that list this module in the field "Prerequisites for Participation."
Prerequisites for the Award of Credit Points	Credit points are awarded when the module examination is passed. The module examination consists of a written exam lasting 150 minutes and a project assignment with a workload of 16 hours. The written exam is mandatory for passing.
Credit Points and Grades	7 credit points can be earned through the module. The module grade is determined from the weighted average of the two examination components, with the written exam weighted ninefold and the project assignment weighted once.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.