

Module Name	Simulation of Drive Engineering
Module Number	Eul-RES-E-SimAT
Responsible Lecturer	Prof. Dr.-Ing. Berthold Schlecht berthold.schlecht@tu-dresden.de
Qualification Objectives	Students are able to apply indispensable numerical methods for solving their own problems in modern product design and use the results for constructive optimization. They are proficient in applying typical procedures for model creation, load input, boundary conditions, and the development of three-dimensional multibody simulation models (MBS). Students are capable of addressing problems such as load and deformation calculations as well as the calculation of natural frequencies and mode shapes through simulation. They are sensitized to critically evaluate results and apply calculation methods critically. Furthermore, they are able to design drive trains for wind turbines and apply the necessary calculation methods for drives in wind turbines.
Contents	The module covers methods for determining masses, mass moments of inertia, stiffness, damping, and the creation, calculation, and evaluation of MBS simulation models. It includes practical applications of model creation using various drive systems, such as wind turbines, ship drives, mill drives, crane hoists, or rail drives. Calculations of typical design parameters such as stress, deformation, misalignment, and contact behavior are also included, as well as methods for result validation, testing application limits, and assessing model quality. Additional topics include the design and layout of drive trains in wind turbines with and without gearboxes, considering the requirements for onshore and offshore applications.
Teaching and Learning Forms	4 hours per week of lectures, 1 hour per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Manufacturing Engineering, Introduction to Analysis and Algebra, Multidimensional Differential and Integral Calculus, Design, Physics, Engineering Mechanics, and Fundamentals of Kinematics and Kinetics are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO in the main study phase of the diploma program Renewable Energy Systems.
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 180 minutes.
Credit Points and Grades	5 credit points can be earned through the module. The module grade corresponds to the grade of the examination performance.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.