

Module Name	Machine Dynamics for Wind Turbines
Module Number	Eul-RES-E-MaDyn
Responsible Lecturer	Prof. Dr.-Ing. Wolf Michael Beitelschmidt michael.beitelschmidt@tu-dresden.de
Qualification Objectives	Students possess profound knowledge and fundamental skills for solving problems in machine dynamics. They have an advanced understanding of modeling fundamental issues and the most important methods of dynamics. They are able to apply the acquired knowledge of dynamics to machines, systems, and components, and to independently, critically, and appropriately analyze and solve fundamental problems.
Contents	The module covers mechanical and mathematical substitute models for typical machine dynamics problems as well as their solution methods. The focus is on the following topics: modeling and parameter identification, damping, dynamics of rigid machines, foundation and vibration isolation, modal analysis of vibration systems (eigenvalue problems), longitudinal, torsional, and bending vibrations, vibration absorbers, mass balancing, balancing of rotor systems, and numerical solutions of machine dynamics problems using a script-based programming language.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Introduction to Analysis and Algebra, Multidimensional Differential and Integral Calculus, Function Theory, Partial Differential Equations and Probability Theory, Design/CAD, Engineering Mechanics, as well as 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 Regenerative Energy Systems. It creates the prerequisites for the modules that list this module under "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.
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 winter semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.