

Module Name	Power Electronics Basics
Module Number	Eul-MT-E-LEG, Eul-RES-C-LEG
Responsible Lecturer	Prof. Dr.-Ing. Steffen Bernet steffen.bernet@tu-dresden.de
Qualification Objectives	After completing the module, students are able to select and roughly dimension suitable circuits as well as to select and design power semiconductor components for power electronic systems in typical applications. Students can verify the basic functionality of the considered power electronic subsystem using simulation tools.
Contents	The module covers the fundamental operation of power electronic actuators, the structure and functionality of actively switchable power semiconductor components and power diodes, the analysis of the operation of line-commutated and self-commutated circuits, the simplification of the considered systems for simulation purposes, the design of the core components of the power electronic subsystem, common modulation methods for controlling power electronic actuators, as well as common control and regulation methods.
Teaching and Learning Forms	2 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 Basics of Electrical Engineering and Physics are required.
Usability	The module is a compulsory module in the main study phase of the diploma program in Regenerative Energy Systems. In the diploma program Mechatronics, it is one of two elective modules in the elective area "Mechatronics Basic Knowledge," of which one must be chosen. 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 120 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.