

Module Name	Design of Power Electronic Systems
Module Number	Eul-ET-E-ELESy, Eul-RES-E-ELESy
Responsible Lecturer	Prof. Dr.-Ing. Steffen Bernet steffen.bernet@tu-dresden.de
Qualification Objectives	After completing the module, students master the methodological fundamentals to simplify power electronic systems and their main components for deriving mathematical models. They are capable of calculating system parameters based on mathematical models, designing components, and developing control and regulation systems.
Contents	The module covers: - Functionality of power electronic topologies for the purpose of mathematical modeling, using basic topologies such as DC-DC converters and active pulse rectifiers as examples, - Structure and functionality of power semiconductor components and the design of their control systems, - Calculation of system parameters under steady-state operating conditions, - Design of passive and active components of the power electronic subsystem, - Design of common control and regulation systems for the systems, - Verification of functionality using simulation tools.
Teaching and Learning Forms	4 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	In the diploma program Electrical Engineering, the competencies to be acquired in the module Power Electronics are required. In the diploma program Renewable Energy Systems, the competencies to be acquired in the module Power Electronics Basics are required.
Usability	The module is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 4 PO of the main study program in the field of Electrical Power Engineering in the diploma program Electrical Engineering. Furthermore, it is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO in the diploma program Renewable Energy Systems. 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 complex assessment with a workload of 60 hours.
Credit Points and Grades	7 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 210 hours.
Duration of the Module	The module lasts one semester.