

Module Name	Power Electronics for Photovoltaics and Wind Turbines
Module Number	Eul-RES-E-LEPVW
Responsible Lecturer	Prof. Dr.-Ing. St. Bernet steffen.bernet@tu-dresden.de
Qualification Objectives	Students master methods for the analysis, modeling, design, and evaluation of suitable circuits as well as power semiconductor devices for power electronic systems used in the operation of photovoltaic generators and wind energy systems. Students are able to verify the functionality of the considered system, including the necessary control and/or regulation, using simulation tools.
Contents	The module includes the structure and functionality of actively switchable power semiconductor devices, the analysis of the functionality of self-commutated circuits and their core components for solar and wind energy systems, such as single-phase and three-phase two-level voltage source converters or three-level voltage source converters. It also covers the design of core components of the power electronic subsystem, such as output filter design, common modulation methods for controlling power electronic actuators, control and regulation methods, as well as safety and operational requirements.
Teaching and Learning Forms	3 hours per week of lectures, 2 hours per week of exercises, 1 hour per week of practical sessions, and self-study.
Prerequisites for Participation	The competencies acquired in the module "Power Electronics Basics" 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 in 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 120 minutes and a complex assignment with a workload of 60 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade is determined by the weighted average of the grades of the examination components. The written exam is weighted twice, and the complex assignment is weighted once.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.