

Module Name	Microprocessor Control in Power Electronics
Module Number	Eul-ET-E-MPSLE, Eul-RES-E-MPSLE
Responsible Lecturer	Prof. Dr.-Ing. Steffen Bernet steffen.bernet@tu-dresden.de
Qualification Objectives	After completing the module, students are able to implement control and regulation tasks using a high-level programming language on a digital control and regulation platform. They are capable of understanding the structure and functionality of digital control and regulation platforms, assessing the essential properties of the digital platform in relation to the task, and evaluating the advantages and disadvantages of different solution approaches.
Contents	The module covers the following topics: - Structure and functionality of common power electronic circuits in energy and drive systems, - Analysis of the properties and simplification of subsystems with regard to modeling for control and regulation design, - Common modulation methods for controlling power electronic actuators and their implementation using a digital platform, - Common control and regulation methods and aspects of their implementation on a digital platform, and - Programming the control of an inverter for operating an asynchronous machine.
Teaching and Learning Forms	1 hour per week of lectures, 2 hours per week of exercises, 2 hours per week of practical lab courses, 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 of the main study program 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 assignment with a workload of 40 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 summer semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.