Module Name	Modeling and Control of Electric Drives
Module Number	EuI-ET-E-MuREA, EuI-MT-E-MuREA, EuI-RES-E-MuREA
Responsible Lecturer	Prof. Dr.-Ing. Matthias Centner matthias.centner@tu-dresden.de
Qualification Objectives	After completing the module, students possess knowledge of the operational behavior of electric drives in automated and mechatronic systems. They are capable of describing, modeling, and designing drive systems, understanding the dynamic processes in electric machines, and applying this knowledge to the design and optimization of controlled systems.
Contents	The module covers: - Elements of drive systems and their dynamic modeling, - Space vector models and transfer behavior of rotating field machines, - Dynamic behavior of electric machines in typical fault cases and operating conditions, - Automated three-phase drives with field-oriented control, - Parasitic effects in the machine-frequency converter system.
Teaching and Learning Forms	4 hours per week of lectures, 1 hour per week of exercises, 1 hour per week of practical lab courses, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules "Electrical Machines" and "Electric Drives" 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 "Methods and Applications" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the diploma program Mechatronics. Additionally, 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 non-public oral examination as an individual examination lasting 45 minutes and a complex assignment with a workload of 30 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 oral examination is weighted sevenfold, and the complex assignment is weighted threefold.
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.