Module Name	Design and Calculation of Electromagnetic Energy Converters
Module Number	EuI-ET-E-EMEW, EuI-RES-E-EMEW
Responsible Lecturer	Prof. Dr.-Ing. Matthias Centner matthias.centner@tu-dresden.de
Qualification Objectives	Upon completion of the module, students possess knowledge of the most important design principles and calculation methods for electrical machines. They are capable of designing, calculating, numerically simulating, and partially optimizing electrical machines.
Contents	The module covers the following topics: - Windings and winding design - Magnetic materials and magnetic circuit design - Determination and recalculation of machine parameters - calculation and efficiency - Heating and cooling - Electromagnetic vibration and noise excitation - Design process, optimization, and scaling laws - Technology - Transformers with a focus on core, windings, insulation, design, power transformers, press constructions, as well as sensors and control devices
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 module "Electrical Machines" 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 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 summer semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.