

Module Name	Electric Drive Technology Advanced
Module Number	Eul-MT-E-M05V
Responsible Lecturer	Prof. Dr.-Ing. Matthias Centner matthias.centner@tu-dresden.de
Qualification Objectives	Upon completion of the module, students are capable of the professional selection, design, and optimization of direct drive and magnetic systems, as well as the calculation and modeling of dynamic processes in electrical drives.
Contents	The module covers the topics of direct drives and magnetic systems, as well as the dynamics of electrical machines. The main focuses of the module are: - Direct Drives: Torque motors, high-speed drives, linear drives, control, applications - Levitation Systems/Magnetic Bearings: Active and passive magnetic bearings, actuators, design and development, control of a radial bearing, rotor dynamics, imbalances, gyroscopic effects, sensors - Dynamics of Electrical Machines: Methodology and models; space vector models, transfer behavior, and dynamic operating states of rotating field machines
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 Power Engineering, Electrical and Fluid Drive Systems, and Power Electronics Basics are required.
Usability	The module is an elective module from 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. 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 60 hours. The complex assignment is a pass/fail requirement.
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 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.