

Module Name	Mechatronic Systems and the Operation of CO₂-Neutral Combustion Engines
Module Number	Eul-MT-E-A03A3
Responsible Lecturer	Prof. Dr. Frank Atzler frank.atzler@tu-dresden.de
Qualification Objectives	Students acquire an advanced and fundamental understanding of electronic control systems and components for CO ₂ -neutral combustion engines, as well as the operating behavior of CO ₂ -neutral combustion engines in conventional and novel vehicle drive systems.
Contents	The module covers the structure, function, and operating principles of electronic and networked mechatronic systems in combustion engines/vehicles, energy supply and distribution, data processing, and digital control loops. Additionally, the module includes the combustion engine as a subsystem in conventional and novel vehicle drive systems, as well as regulations on exhaust emissions.
Teaching and Learning Forms	4 hours per week of lectures, 1 hour per week of practical exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Basics of Electrical Engineering, Physics, Fundamentals of Kinematics and Kinetics, and Materials Science 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. The module cannot be chosen if the module "Vehicle Electronics and Diagnostics" has already been selected. 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 written exam lasting 240 minutes and an ungraded portfolio with a workload of 20 hours.
Credit Points and Grades	5 credit points can be earned through the module. The module grade is determined in accordance with § 15 paragraph 1 sentences 5 and 6 of the examination regulations, based on the unweighted average of the grades of the individual examination components.
Frequency of the Module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.