

Module Name	Basics of Internal Combustion Engines and Powertrain Systems
Module Number	Eul-MT-E-A03A1
Responsible Lecturer	Prof. Dr. Frank Atzler frank.atzler@tu-dresden.de
Qualification Objectives	Students acquire fundamental knowledge of various types of drive and working machines in general and internal combustion engines in particular, including their system behavior and the adaptation of different speed and torque ratios. Furthermore, students master the basics of planning, selection, dimensioning, and constructive implementation of individual components and complex drive systems.
Contents	The module covers the fundamentals of internal combustion engines and drive systems with regard to their designs and properties. Topics include the structure and operation of an internal combustion engine, physical and thermodynamic processes, pollutant formation and prevention, as well as control and regulation. Additionally, the module addresses drive machines, working machines, and intermediate couplings, covering their structure, function, and areas of application, as well as the control, regulation, and modeling of drive systems.
Teaching and Learning Forms	4 hours per week of lectures and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Manufacturing Engineering, Physics, Technical Mechanics, Fundamentals of Kinematics and Kinetics, Materials, and Design Methodologies 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 selected if the module "Advanced Fundamentals of CO ₂ -Neutral Internal Combustion Engines" has already been chosen. 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.
Credit Points and Grades	5 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 winter semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.