

Module Name	Multiphysical Field Problems
Module Number	Eul-MT-E-MPhFP
Responsible Lecturer	Prof. Dr.-Ing. Thomas Wallmersperger thomas.wallmersperger@tu-dresden.de
Qualification Objectives	After completing the module, students master the fundamental principles for the mathematical description of mechanical, thermal, electrical, and magnetic phenomena in deformable materials. These principles form the basis for analytical and numerical calculations of the essential fields in space and time that are critical for the functionality of components.
Contents	The module covers the kinematics of material continua, selection of appropriate field variables, global and local balances in mechanics, thermodynamics, and electrodynamics, the theory of material equations, as well as examples for solving initial/boundary value problems.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Multidimensional Differential and Integral Calculus, Complex Analysis, Partial Differential Equations and Probability Theory, Physics, Materials, Engineering Mechanics, Fundamentals of Kinematics and Kinetics, Kinematics and Strength of Materials Advanced, Basics of Electrical Engineering, as well as Electric and Magnetic Fields are required.
Usability	The module is one of four elective modules in the specialization area "Mechatronics Advanced Knowledge" within the main study phase of the diploma program in Mechatronics. Three of these modules must be 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 150 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 summer semester.
Workload	The total workload is 150 hours.
Duration of the Module	The module lasts one semester.