

Module Name	Biomedical Engineering Advanced
Module Number	Eul-MT-E-A12V
Responsible Lecturer	Prof. Dr.-Ing. H. Malberg lehre.ibmt@tu-dresden.de
Qualification Objectives	After completing the module, students are able to design systems for measuring physiological parameters while considering the complex interactions between organisms and technology. Furthermore, students can design automated systems for diagnosis and organ support and are familiar with the most important therapeutic medical engineering procedures. They are capable of transferring basic biological and physiological principles to technical applications.
Contents	The module contents include: - Fundamentals of medical engineering for diagnosis and therapy - Relevant physical, physiological, and biochemical principles - Basic principles and structure of medical devices - Diagnostic data acquisition - Automated processing of diagnostic signals and information - Therapeutic procedures - Organ support systems - Structure and function of life-support systems - Technical aspects of medical devices in laboratory experiments - Biomaterials, biocompatibility, and bionics Additional module contents focus on the structure and function of medical systems for diagnostics and therapy of: - The cardiovascular system - The sensory organs - The musculoskeletal system - The urinary and digestive systems - The peripheral and central nervous systems
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 acquired in the module Biomedical Engineering for Mechatronic Engineers 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 written exam lasting 120 minutes and a complex assignment with a workload of 20 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 written exam is weighted sevenfold, and the complex assignment is weighted threefold.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.