Module Name	Signal Processing in Biomedical Engineering
Module Number	EuI-ET-E-SVBMT
Responsible Lecturer	Prof. Dr.-Ing. habil. Hagen Malberg lehre.ibmt@tu-dresden.de
Qualification Objectives	After completing the module, students possess knowledge, skills, and competencies for IT-supported analysis of physiological signals. They are familiar with the functional principles and methodological tools for the development of such systems.
Contents	The module covers the fundamentals of signal processing, particularly digital filtering, signal analysis in the frequency domain, including time-frequency analysis, transformations, linear prediction, and methods for dimensionality reduction. It also includes specialized biosignal processing, particularly the medical signal processing chain, artifact handling, and principal component analysis, biosignal analysis in the time domain, biosignal analysis using nonlinear and knowledge-based methods, medical statistics and study design, as well as the application of artificial intelligence in biomedical engineering, particularly knowledge-based systems and artificial neural networks.
Teaching and Learning Forms	4 hours per week of lectures, 2 hours per week of seminars, and self-study.
Prerequisites for Participation	The competencies to be acquired in the modules Systems Theory and Biomedical Engineering are required.
Usability	The module is an elective module from the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 4 PO of the main study program in the field of Electronic Systems, Micro and Medical Technology in the diploma program Electrical Engineering. It creates the prerequisites for the modules that list this module in the field "Prerequisites for Participation." The module cannot be chosen if the module Signal Theory has already been selected.
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 25 hours.
Credit Points and Grades	7 credit points can be earned through the module. The module grade is determined by the unweighted average of the grades of the examination components.
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.