

Module Name	Biosignal-Based Human-Machine Communication
Module Number	Eul-ET-E-BsMMK, Eul-BMT-E-BsMMK, Eul-IST-E-BsMMK
Responsible Lecturer	Prof. Dr.-Ing. Peter Birkholz peter.birkholz@tu-dresden.de
Qualification Objectives	After completing the module, students possess the knowledge and skills to record a corpus of speech-related biosignals, preprocess the data (e.g., feature analysis), and classify the data, for example, to recognize silently produced speech sounds.
Contents	The module covers the acquisition, analysis, and classification of speech-related biosignals, such as speech movements, voice signals, breathing signals, and brain signals, for novel human-machine interfaces. Relevant measurement techniques and signal processing methods are introduced. Additionally, fundamental methods for signal classification based on machine learning are addressed.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of practical lab courses, and self-study.
Prerequisites for Participation	In the diploma program Electrical Engineering, basic knowledge of signal processing and programming in Python is required, as acquired in the modules Signal Theory and Software Engineering Basics. In the diploma program Information Systems Engineering, basic knowledge of signal processing is required, as acquired in the module Signal Processing. In the diploma program Biomedical Engineering, the knowledge acquired in the modules Software Engineering Basics and Biosignal Processing is required.
Usability	The module is an elective module in 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 Information Technology in the diploma program Electrical Engineering. Furthermore, it is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the field of Communication Technology in the diploma program Information Systems Engineering. Additionally, it is an elective module in the elective area "Biomedical-Technical Deepening" according to § 6 paragraph 3 SO and § 33 paragraph 3 PO of the main study program in the diploma program Biomedical Engineering. 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 non-public oral examination as an individual examination lasting 40 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.