

Module Name	Digital Signal Processing Systems
Module Number	Eul-ET-E-DigSV, Eul-IST-E-DigSV
Responsible Lecturer	Prof. Dr.-Ing. Gerhard Fettweis gerhard.fettweis@tu-dresden.de
Qualification Objectives	After completing the module, students possess mathematical tools for describing and analyzing discrete-time systems, such as signal sampling and reconstruction, digital filters, spectral analysis of discrete-time systems, quantization effects, and multirate systems. They are able to apply these tools in the design and implementation of digital signal processing systems. Furthermore, students are capable of simulating and implementing signal processing components.
Contents	The module covers the description and analysis of realizable discrete-time systems in the time, frequency, and z-domain; design methods for non-recursive and recursive digital filters; spectral analysis using discrete and fast Fourier transformation; realization of digital signal processing systems; and the effects of signal and parameter approximation on system functionality.
Teaching and Learning Forms	3 hours per week of lectures, 1 hour per week of exercises, 2 hours per week of practical lab courses, and self-study.
Prerequisites for Participation	The competencies acquired in the module "Systems Theory" are required.
Usability	The module is an elective module within the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 4 of the examination regulations for the main study program in the field of Information Technology in the diploma program Electrical Engineering. Furthermore, it is an elective module within the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 3 of the examination regulations for the main study program in the field of Communication Technology in the diploma program Information Systems Engineering. The module creates the prerequisites for the modules that list it under "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 120-minute written exam and a portfolio with a workload of 24 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 twice, and the portfolio is weighted once.
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.