

Module Name	HW/SW Codesign for Digital Signal Processing
Module Number	Eul-ET-E-HwSwD, Eul-IST-E-HwSwD
Responsible Lecturer	Prof. Dr.-Ing. Gerhard Fettweis gerhard.fettweis@tu-dresden.de
Qualification Objectives	After completing the module, students have knowledge of current hardware architectures, particularly various hardware platforms for the software implementation of digital signal processing algorithms, and can evaluate them based on various criteria such as flexibility and power consumption. Students can derive hardware requirements from algorithms while considering flexibility requirements for hardware and software components. They are familiar with strategies for performance enhancement and power consumption minimization and can apply these confidently.
Contents	The module covers methods for hardware and software implementation of telecommunication problems, design and optimization methodology for digital signal processing systems considering the mutual influence of HW and SW (codesign), algorithm transformation for pipelined and parallel processing, as well as new parallel processing concepts through massive structural miniaturization towards the nano scale.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, 2 hours per week of practical lab courses, and self-study. The language of instruction for lectures, exercises, and practical lab courses is English.
Prerequisites for Participation	The competencies to be acquired in the modules Fundamentals of Electrical Engineering, Circuit Technology, and Systems Theory are required.
Usability	The module is an elective module in the elective area "Competence Deepening" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 4 of the examination regulations 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 of the study regulations and § 33 paragraph 3 of the examination regulations of 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 written exam lasting 120 minutes and a portfolio with a workload of 10 hours. The examination language is English.
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 summer semester.
Workload	The total workload is 210 hours.
Duration of the Module	The module lasts one semester.