

Only the german version of the module description as part of the study regulations is legally binding.

Module name	Introduction to Computer Engineering
Module number	INF-25-Ma-FTI-ETI
Responsible lecturer	Prof. Dr. Wolfgang Nagel wolfgang.nagel@tu-dresden.de
Qualification objectives	Students can explain and evaluate implementation concepts for both embedded systems and parallel computers. They understand the interdependence of hardware and software in computer systems, can derive design decisions for embedded systems from this and implement these using high-level synthesis tools. They can classify and evaluate reliability and low-power challenges in the design of embedded systems and describe and discuss modern design techniques such as approximate computing and new transistor technologies. They are able to use different approaches to formulate parallel programs and can assess how these are mapped to different architectures. They can assess and evaluate the effects of program alternatives and architectural decisions. In addition to manual parallelization, students can explain the challenges of automatic code parallelization, apply formal parallel computation models and reproduce the basics of domain-specific languages.
Content	Contents of the module are design, modeling, programming, simulation and realization of technical systems in the field of embedded systems and parallel processing.
Teaching and learning methods	The module comprises lectures of 4 SWS, exercises of 2 SWS, practicals of 2 SWS and self-study. The language of instruction for the lectures, exercises and practicals may be German or English and will be specified by the lecturer at the beginning of each semester and announced in the usual manner.
Prerequisites for participation	In the Diploma program in Computer Science, the competencies to be acquired in the module INF-25-Ba-RA Computer Architecture and Hardware Laboratory are a prerequisite. In the Master's degree course in Computer Science, knowledge of the structure of computer systems at Bachelor's level is required.
Applicability	The module is a compulsory elective module in the Computer Engineering and High Performance Computing subject area in the main course of the Diplom degree program in Computer Science, which must be selected in accordance with Annex 2 to the examination regulations. In the Master's degree program in Computer Science, the module is a compulsory elective module in the open track in the subject area of Computer Engineering and High Performance Computing and the supplement, which must be selected in accordance with Annex 2 to the Examination Regulations. The module can only be chosen once in the Master's degree program Computer Science. The module cannot be selected in the Master's degree program in Computer Science if this module or a module with the same content from a degree program in which the admission

	requirements according to § 3 of the study regulations have been fulfilled has already been completed. The module fulfills the prerequisites for the modules listed under prerequisites for participation.
Requirements for earning credit points	The credit points are earned if the module examination is passed. The module examination consists of a non-public oral examination as an individual examination lasting 30 minutes. The examination language may be German or English and will be specified by the lecturer at the beginning of each semester and announced in the usual manner.
Credit points and grades	12 credit points can be acquired through the module. The module grade corresponds to the grade of the examination.
Module frequency	The module is offered every winter semester.
Workload	The total workload is 360 hours.
Module duration	The module comprises one semester.