

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

Module name	Adaptive Computing Systems for Robotics
Module number	INF-25-Ma-FTI-ACSR
Responsible lecturer	Prof. Dr. Diana Göhringer diana.goehringer@tu-dresden.de
Qualification objectives	Students have qualified knowledge in the fields of design and programming of modern embedded systems for robot applications and in the field of robotics in the areas of perception, localization, planning and multi-robot collaboration tasks. They are also capable of using modern embedded systems such as the Xilinx Zynq System-on-Chip and software environments for robotics applications such as Robotics Operating System (ROS) and Embedded Linux.
contents	Contents of the module are state-of-the-art FPGA-based robotics computing accelerator designs and their optimized techniques. The module includes the use of FPGAs in robotic perception, localization and planning, the method of combining these into robot products, such as autonomous vehicles and mobile robots, as well as practical experience with robotic and reconfigurable platforms.
Forms of teaching and learning	The module includes lectures in the scope of 2 SWS, exercises in the scope of 2 SWS and self-study. The teaching language of the lectures and exercises is English.
Requirements for participation	The graduate degree programme in Computer Science and the bachelor's degree programme in Computer Science assume the competencies to be acquired in the modules INF-25-Ba-RA Computer Architecture and Hardware Laboratory, INF-25-Ba-SWT Software Technology and INF-25-Ba-SWWTP Software Technology Project.
usability	The module is a compulsory elective module in the field of Computer Engineering and High Performance Computing in the diploma course Computer Science in the main course of study, which must be chosen in accordance with Annex 2 to the examination regulations. In the Bachelor's programme in Computer Science, the module is a compulsory elective module of specialisation, which must be chosen in accordance with the annex to the examination regulations. The module in the Master's programme Computer Science is a compulsory elective module in the Open Track in the subject area Computer Engineering and High Performance Computing as well as the supplement, which is to be selected in accordance with Annex 2 to the Examination Regulations, and in the Distributed Systems Engineering Track, which is to be selected in accordance with Annex 3 to the Examination Regulations. The module can only be selected once in the Master's programme Computer Science. The module cannot be selected in the Master's program Computer Science if this or a substantially identical module from a degree program with which the admission requirements according to § 3 of the study regulations have been fulfilled, has already been completed. The module creates the prerequisites for the modules, which it names under prerequisites for

	participation.
Conditions for awarding credits	The credit points are earned when the module examination has been passed. The module exam consists of a 60-minute exam. The language of the exam is English.
Credits and grades	6 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 180 hours.
Duration of the module	The module covers one semester.