Module name	**Circuit and System Design**
Module number	CMS-TRK-CSD
Senior Lecturer	Prof. Dr. Christian Georg Mayr christian.mayr@tu-dresden.de
Qualification objectives	Students are able to systematically develop the data path (register-transfer description) and control unit (FSM) of an autonomously selected numerical algorithm using a data dependency graph. You know the implementation flow, which includes both automated synthesis of complex blocks based on a hardware description language, such as verilog, and manually optimised digital data path elements.
Contents	The content of the module is the basis and methods for the development of application-specific digital integrated circuits (ASICs). This includes the translation of a numeric algorithm into a data dependency graph, the use of editing and allocation techniques, optimisation in terms of resource consumption, such as surface area and duration, and the implementation and functional verification, simulation of ASIC.
Forms of teaching and learning	The module includes lectures of 2 SWS, exercises of 1 SWS, projects of 2 SWS and self-study. The teaching language of lectures, exercises and projects can be German or English and will be specifically determined by the teacher at the beginning of each semester and announced in the usual way.
Eligibility for participation	Basic knowledge of system theory, such as filter design, algebra, differential equations and bachelor level function theory, as well as the skills to be acquired in the CMS-TRK-DCD Digital Circuit Design module, are required.
Usability	In the Computational Modeling and Simulation Masters Course, the module is a compulsory voting module in the Track Applied Artificial Intelligence, to be selected in accordance with Annex 2 to the Specific Examination Regulations. The module cannot be chosen in the Master's Course Computational Modeling and Simulation if this or a module with substantially the same content from a Course with which the entry conditions under § 3 of the Studienordnung have been met has already been completed. The module provides the pre-requisites for the modules it designates under the pre-requisites for participation.
Conditions for the award of credits	Credits are awarded when the module test is passed. The module test consists of a complex service of 40 hours. The language of the test will be English.
Credits and marks	The module allows 5 credit points to be obtained. The module score corresponds to the test performance score.

Frequency of the module	The module is offered every summer semester.
Workload	The total workload is 150 hours.
Duration of the module	The module covers 1 semester.