

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

Module name	Compiler construction
Module number	INF-25-Ma-FSP-CB
Responsible lecturer	Prof. Dr. Jerónimo Castrillon jeronimo.castrillon@tu-dresden.de
Qualification objectives	Students master the methodological basics of compiler construction as well as the associated compiler phases and algorithms. They have a basic understanding of the structure of programming languages consisting of lexis, syntax and semantics as well as the associated formalisms such as automata, parsers and context-free grammars. Students know analysis and optimization algorithms based on intermediate code and can apply them. Students understand the influence of processor architecture features on the complexity of compiler backends and know the most important procedures for code generation.
Content	The content of the module includes general compiler construction based on the process of how a high-level language is translated step by step into optimized machine code. In particular, the basis for the implementation of theoretical concepts of computer science in practice, the influence of processor architecture on software performance and basic and advanced optimization techniques are the subject of the module. In particular, the module includes the phases of a compiler consisting of the front end with lexical, syntactic and semantic analysis, the middle end with intermediate code representations, control and data flow analyses and compiler optimizations as well as the back end dealing with target architectures, code selection, scheduling and register allocation.
Teaching and learning methods	The module comprises lectures of 2 SWS, exercises of 2 SWS and the self-studium. The language of instruction for the lectures and exercises is English.
Prerequisites for participation	In the Diploma degree program in Computer Science and in the Bachelor's degree program in Computer Science, the competences to be acquired in the modules INF-25-Ba-AuB Automata and Computability Theory and INF-25-Ba-AuD Algorithms and Data Structures are a prerequisite. In the Bachelor's degree course in Applied Computer Science, the competences to be acquired in the modules INF-25-Ba-ETHI Introduction to Theoretical Computer Science and INF-25-Ba-AuD Algorithms and Data Structures are a prerequisite. Knowledge of formal languages as well as algorithms and data structures at Bachelor's level is required for the Master's degree course in Computer Science.
Applicability	The module is a compulsory elective module in the subject area Software Technology and Programming Languages in the Diploma degree program in Computer Science in the main course of study, which must be selected in accordance with Annex 2 to the examination regulations. In the Bachelor's degree program in Computer Science, the module is a

	compulsory elective module in the subject specialization, which must be selected in accordance with the annex to the examination regulations. In the Bachelor's degree course in Applied Computer Science, the module is a compulsory elective module in the specialization in Media Informatics and in the specialization in g Medical Informatics, which must be selected in accordance with the annex 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 Software Technology and Programming Languages and the supplementary g, which must be selected in accordance with Annex 2 to the Examination Regulations. The module can only be selected once in the Master's degree program in Computer Science . The module cannot be selected in the Master's degree program in Computer Science if this module or a substantially similar module 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 written examination lasting 120 minutes. The examination language is English.
Credit points and grades	6 credit points can be earned 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 180 hours.
Module duration	The module comprises one semester.