

Module Name	Compiler Construction
Module Number	INF-IST-E-CB
Responsible Lecturer	Prof. Dr. Jerónimo Castrillon jeronimo.castrillon@tu-dresden.de
Qualification Objectives	Students master the methodological foundations 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 lexicon, syntax, and semantics, as well as the associated formalisms such as automata, parsers, and context-free grammars. Students are familiar with analysis and optimization algorithms based on intermediate code and can apply them. They understand the influence of processor architecture features on the complexity of compiler backends and are familiar with the most important methods for code generation.
Contents	The module covers general compiler construction based on the process of stepwise translation of a high-level language into optimized machine code. In particular, the module addresses the implementation of theoretical computer science concepts in practice, the influence of processor architecture on software performance, and basic as well as advanced optimization techniques. The module specifically includes the phases of a compiler: the frontend with lexical, syntactic, and semantic analysis; the middle-end with intermediate code representations, control and data flow analyses, and compiler optimizations; and the backend, which deals with target architectures, code selection, scheduling, and register allocation.
Teaching and Learning Forms	2 hours per week of lectures, 2 hours per week of exercises, and self-study. The language of instruction for lectures and exercises is English.
Prerequisites for Participation	The competencies to be acquired in the module "Algorithms and Data Structures" are required.
Usability	The module is an elective module from the elective area "Orientation" according to § 6 paragraph 3 of the study regulations and § 33 paragraph 3 of the examination regulations of the main study program in the diploma program Information Systems Engineering. It creates the prerequisites for the modules that list this module in the field "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. The language of the examination 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 performance.
Frequency of the Module	The module is offered every winter semester.
Workload	The total workload is 180 hours.
Duration of the Module	The module lasts one semester.