

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

Module name	Introduction to theoretical computer science
Module number	INF-25-Ba-ETHI
Responsible lecturer	Dr. Sascha Klüppelholz sascha.klueppelholz@tu-dresden.de
Qualification objectives	Students are familiar with the important fundamentals of computer science from the fields of automata theory, formal languages and computability and complexity theory. They have knowledge of the abstraction of algorithmic problems and their mathematical formalization, techniques for the analysis of concrete algorithmic solutions with regard to correctness and resource requirements, such as runtime and storage space. They are familiar with the essential concepts for proving the unsolvability or complexity-theoretical difficulty of algorithmic problems.
Content	The module covers the basic concepts of computability theory using abstract computational models, for example Turing and register machines, introduction to complexity theory, in particular the P-NP problem, automata theory and formal languages, for example regular and context-free languages.
Teaching and learning methods	The module comprises lectures of 2 SWS, exercises of 2 SWS and self-study. The language of instruction for the lectures and exercises is German.
Prerequisites for participation	The competences to be acquired in the modules INF-25-Ba-Ma1 Linear Algebra and Analysis, INF-25-Ba-Ma2 Discrete structures, INF-25-Ba-Prg Programming and RoboLab and INF-25-Ba-AuD Algorithms and Data Structures are assumed.
Applicability	The module is a compulsory module in the Bachelor's degree course in Applied Informatics. The module creates 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 60 minutes. The examination language is German.
Credit points and grades	5 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 summer semester.
Workload	The total workload is 150 hours.
Module duration	The module comprises one Semester.