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

Module name	**Algorithms and Data Structures 2**
Module number	INF-25-Ma-FTK-AD2
Responsible lecturer	Prof. Dr. László Kozma laszlo.kozma@tu-dresden.de
Qualification objectives	Students have advanced knowledge of scientific methods in the development and analysis of algorithms and data structures. They understand the properties of specific computational models and their impact on the analysis of algorithms. They have a broad repertoire of advanced techniques and an overview of representative algorithmic problems and their complexity. You can apply these to the formal presentation of algorithmic problems as well as the development and analysis of algorithms.
contents	Contents of the module are algorithms and data structures as well as topics of complexity theory, the techniques of dynamic programming, divide-and-conquer, fast fourier transformation, the amortized analysis of data structures and randomization. Other topics include flow problems and shortest path problems in graphs, arithmetic algorithms, advanced data structures and proof of lower barriers.
Forms of teaching and learning	The module includes lectures in the scope of 4 SWS and exercises in the scope of 2 SWS as well as self-study. The teaching language of the lectures and the exercises can be German or English and will be specified by the lecturer at the beginning of each semester and announced in the usual way.
Requirements for participation	In the Computer Science degree program, the competencies to be acquired in the modules INF-25-Ba-AuD Algorithms and Data Structures, INF-25-Ba-AuB Automata and Predictability Theory, INF-25-Ba-LuK Logic and Complexity, INF-25-Ba-Ma1 Linear Algebra and Analysis, INF-25-Ba-Ma2 Discrete Structures and INF-25-Ba-Ma3 Algebra are required. The Master's programme in Computer Science requires knowledge of the basics of algorithm design, formal languages, theoretical computer science and mathematics at Bachelor's level.

usability	The module is a compulsory elective module in the field of Theoretical Computer Science and Symbolic Artificial Intelligence in the master's degree programme Computer Science, which must be chosen in accordance with Annex 2 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 Theoretical Computer Science and Symbolic Artificial Intelligence as well as the supplement, which is to be selected in accordance with Annex 2 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 examination consists of a non-public oral examination performance as an individual examination of 30 minutes duration. The language of the examination is German or English at the choice of the student.
Credits and grades	9 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 270 hours.
Duration of the module	The module consists of 1 semester.