

|   |                          |   |
|---|--------------------------|---|
| <b>Module title</b>   |                          | <b>Abbreviation</b>                         |
| Algorithms and data structures  |                          | 10-I-ADS-152-m01                            |
| <b>Module coordinator</b>   |                          | <b>Module offered by</b>                    |
| Dean of Studies Informatik (Computer Science)   |                          | Institute of Computer Science               |
| <b>ECTS</b>   | <b>Method of grading</b> | <b>Only after succ. compl. of module(s)</b> |
| 10  | numerical grade          | --  |
| <b>Duration</b>   | <b>Module level</b>      | <b>Other prerequisites</b>                  |
| 1 semester  | undergraduate            | --  |
| <b>Contents</b>   |                          |   |
| Design and analysis of algorithms, recursion vs. iteration, sort and search methods, data structures, abstract data types, lists, trees, graphs, basic graph algorithms, programming in Java.   |                          |   |
| <b>Intended learning outcomes</b>   |                          |   |
| Students are proficient in independently designing, precisely describing and analyzing algorithms. The students know the basic paradigms for the design of algorithms and can implement them in practical programs. Students are able to estimate the runtime behavior of algorithms and prove the correctness of algorithms.   |                          |   |
| <b>Courses</b> (type, number of weekly contact hours, language – if other than German)  |                          |   |
| V (4) + Ü (2)   |                          |   |
| <b>Method of assessment</b> (type, scope, language – if other than German, examination offered – if not every semester, information on whether module is creditable for bonus)  |                          |   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).<br>creditable for bonus   |                          |   |
| <b>Allocation of places</b>   |                          |   |
| --  |                          |   |
| <b>Additional information</b>   |                          |   |
| --  |                          |   |
| <b>Workload</b>   |                          |   |
| 300 h   |                          |   |
| <b>Teaching cycle</b>   |                          |   |
| --  |                          |   |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |                          |   |
| § 49 I Nr. 1a<br>§ 69 I Nr. 1a  |                          |   |
| <b>Module appears in</b>  |                          |   |
| Bachelor' degree (1 major) Computer Science (2015)<br>Bachelor' degree (1 major) Mathematics (2015)<br>Bachelor' degree (1 major) Economathematics (2015)<br>Bachelor' degree (1 major) Human-Computer Systems (2015)<br>Bachelor' degree (1 major) Computational Mathematics (2015)<br>Bachelor' degree (1 major) Aerospace Computer Science (2015)<br>First state examination for the teaching degree Realschule Computer Science (2015)<br>First state examination for the teaching degree Gymnasium Computer Science (2015)<br>Bachelor' degree (1 major) Aerospace Computer Science (2017)<br>Bachelor' degree (1 major) Computer Science (2017) |                          |   |

Bachelor' degree (1 major) Computer Science (2019)  
Bachelor' degree (1 major) Aerospace Computer Science (2020)  
Bachelor' degree (1 major) Computer Science und Sustainability (2021)  
Bachelor' degree (1 major) Mathematics (2023)