**Module title**  
Algorithms and data structures

**Abbreviation**  
10-I-ADS-152-m01

**Module coordinator**  
Dean of Studies Informatik (Computer Science)

**Module offered by**  
Institute of Computer Science

**ECTS**  
10

**Method of grading**  
numerical grade

**Only after succ. compl. of module(s)**  
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**Duration**  
1 semester

**Module level**  
undergraduate

**Other prerequisites**  
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**Contents**

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.

**Intended learning outcomes**

The students are able to independently design algorithms as well as to precisely describe and analyse them. The students are familiar with the basic paradigms of the design of algorithms and are able to apply them in practical programs. The students are able to estimate the run-time behaviour of algorithms and to prove their correctness.

**Courses**

(type, number of weekly contact hours, language — if other than German)

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**Method of assessment**

(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).

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).

creditable for bonus

**Allocation of places**  
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**Additional information**  
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

§ 49 I Nr. 1a  
§ 69 I Nr. 1a

**Module appears in**

Bachelor' degree (1 major) Computer Science (2015)  
Bachelor' degree (1 major) Mathematics (2015)  
Bachelor' degree (1 major) Economathematics (2015)  
Bachelor' degree (1 major) Human-Computer Systems (2015)  
Bachelor' degree (1 major) Computational Mathematics (2015)  
Bachelor' degree (1 major) Aerospace Computer Science (2015)  
First state examination for the teaching degree Realschule Computer Science (2015)  
First state examination for the teaching degree Gymnasium Computer Science (2015)  
Bachelor' degree (1 major) Aerospace Computer Science (2017)  
Bachelor' degree (1 major) Computer Science (2017)  
Bachelor' degree (1 major) Computer Science (2019)