

## Module description

| Module title   |       |                                      |  |                   | Abbreviation |
|--|-------|--------------------------------------|--|-------------------|--------------|
| Theory of complexity 10-I-KT-072-m01   |       |                                      |  |                   |              |
| Module coordinator   |       |                                      |  | Module offered by |              |
| Dean of Studies Informatik (Computer   |       |                                      | Science) Institute of Computer Science |                   |              |
| ECTS Method of grading   |       | Only after succ. compl. of module(s) |  |                   |              |
| 8  | numer | ical grade                           |  |                   |              |
| Duration   |       | Module level                         | Other prerequisites                    |                   |              |
| 1 semester   |       | undergraduate                        |  |                   |              |
| Contents   |       |                                      |  |                   |              |
| Complexity measurements and classes, general relationships between space and time classes, memory con-<br>sumption versus computation time, determinism versus indeterminism, hierarchical theorems, translation me-<br>thods, P-NP problem, completeness problems, Turing reduction, interactive proof systems.   |       |                                      |  |                   |              |
| Intended learning outcomes   |       |                                      |  |                   |              |
| ments and classes, general relationships between space and time classes, memory consumption versus com-<br>putation time, determinism versus indeterminism, hierarchical theorems, translation methods, P-NP problem,<br>completeness problems, Turing reduction, interactive proof systems.] [Version 2: The students possess a fun-<br>damental and applicable knowledge in the areas of complexity measurements and classes, memory consumpti-<br>on versus computation time, determinism versus indeterminism, P-NP problem, completeness problems, lower<br>bounds, Boolean hierarchy, polynomial time hierarchy, complexity of parallel algorithms and complexity of pro-<br>babilistic algorithms.] |       |                                      |  |                   |              |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)   |       |                                      |  |                   |              |
| V + Ü (no information on SWS (weekly contact hours) and course language available)   |       |                                      |  |                   |              |
| 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 (80 minutes) or oral examination (one candidate each: 20 minutes, groups of 2: 30 minutes, groups of 3: 40 minutes)  |       |                                      |  |                   |              |
| Allocation of places   |       |                                      |  |                   |              |
|  |       |                                      |  |                   |              |
| Additional information   |       |                                      |  |                   |              |
|  |       |                                      |  |                   |              |
| Workload   |       |                                      |  |                   |              |
|  |       |                                      |  |                   |              |
| Teaching cycle   |       |                                      |  |                   |              |
|  |       |                                      |  |                   |              |
| Referred to in LPO I (examination regulations for teaching-degree programmes)  |       |                                      |  |                   |              |
|  |       |                                      |  |                   |              |
| Module appears in  |       |                                      |  |                   |              |
| Bachelor's degree (1 major) Computer Science (2007)<br>Bachelor's degree (1 major) Mathematics (2008)<br>Bachelor's degree (1 major) Mathematics (2007)<br>Bachelor's degree (1 major) Computational Mathematics (2009)  |       |                                      |  |                   |              |
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