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| <b>Module title</b>  |                          | <b>Abbreviation</b>  |
| Algorithmic Graph Theory   |                          | 10-I-AGT-122-m01   |
| <b>Module coordinator</b>  |                          | <b>Module offered by</b>   |
| holder of the Chair of Computer Science I  |                          | Institute of Computer Science  |
| <b>ECTS</b>  | <b>Method of grading</b> | <b>Only after succ. compl. of module(s)</b>  |
| 5  | numerical grade          | --   |
| <b>Duration</b>  | <b>Module level</b>      | <b>Other prerequisites</b>   |
| 1 semester   | undergraduate            | Where applicable, prerequisites as specified by the lecturer at the beginning of the course (e. g. completion of exercises). |
| <b>Contents</b>  |                          |  |
| We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable.        |                          |  |
| <b>Intended learning outcomes</b>  |                          |  |
| The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph 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)   |                          |  |
| <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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes)<br>Language of assessment: English, German if agreed upon with the examiner |                          |  |
| <b>Allocation of places</b>  |                          |  |
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| <b>Additional information</b>  |                          |  |
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| <b>Workload</b>  |                          |  |
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| <b>Teaching cycle</b>  |                          |  |
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| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |                          |  |
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| <b>Module appears in</b>   |                          |  |
| Bachelor' degree (1 major) Mathematics (2012)<br>Bachelor' degree (1 major) Mathematics (2013)<br>Bachelor' degree (1 major) Computational Mathematics (2012)<br>Bachelor' degree (1 major) Computational Mathematics (2013)<br>Master's degree (1 major) Mathematics (2012)<br>Master's degree (1 major) Computational Mathematics (2012)   |                          |  |