

Module title		Abbreviation
Graphtheoretical concepts and algorithms		10-I-GT-072-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science I		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
[Version 1: Paths, cycles and components, colouring and matching, transitive hull and irreducible kernel, trees, forests and matroids, depth first search, breadth first search, shortest paths, flows and streams, matchings, network design and routing, planar graphs, graph transformations] [Version 2: On the one hand, we handle 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. On the other hand, we become familiar with new concepts, using the examples of graph problems, for example how we model problems as linear programs or how we show that they are fixed parameter computable.]		
Intended learning outcomes		
[Version 1: The students master the following topics: the most important graph theoretical concepts and algorithms: paths, cycles and components, colourings and matching, transitive hull and irreducible kernel, trees, forests, matroids, depth first search, breadth first search, shortest path, flows and streams, matching, network design and routing, planar graphs, graph transformations.] [Version 2: The students are able to model typical problems of computer science as graph problems. In addition, the participants are able to decide which tool from the lecture helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms.]		
Courses (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		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Computational Mathematics (2009)		