Algorithm Engineering

Module title:	Credits:	Responsible person:
Algorithm Engineering	9	Niedermeier, Rolf
	Office:	**Contact person:**
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Website:	**Display language:**	**E-mail address:**
http://www.isis.tu-berlin.de/course/	German/English	lehre@akt.tu-berlin.de

Learning Outcomes

On successful completion, students will be able to
- develop and implement efficient algorithms,
- estimate the running time and space consumption of algorithms,
- use standard algorithm libraries and adequate data structures to engineer their algorithms,
- work in teams, and
- give a short oral presentation of the main features of their implementation.

Content

Learning Content:
The course
- gives an introduction to the basic techniques of Algorithm Engineering, with a particular focus on NP-hard problems,
- helps to design, analyze, and implement algorithms, and
- provides insight into problem modeling and solution strategies including search tree algorithms, data reduction techniques, preprocessing, approximation, heuristics, and approaches based on linear programming (using established solvers).

Module Components

Course Name	Type	Number	Cycle	SWS
Algorithm Engineering	PJ	0434 L 215/1	k.A.	6

Workload and Credit Points

Algorithm Engineering (Projekt)	Multiplier	Hours	Total
No information	15.0	6.0h	90.0h
No information	15.0	12.0h	180.0h
			270.0h

The Workload of the module sums up to 270.0 Hours. Therefor the module contains 9 Credits.

Description of Teaching and Learning Methods

Regelmäßiger Wechsel von Wissens- und Methodenvermittlung in der Vorlesung und Projektarbeit in Kleingruppen.
Diese umfasst regelmäßige Projektbesprechung, Präsentation von Milestones und Wettbewerbe um schnellsten Lösungscode.

Regular switch between the lecture and project work in small groups. The students apply the methods and knowledge taught in the lecture in the project work.
This includes project meetings on regular basis, presentation of mile stones, and competitions for the fastest implementation.

Requirements for participation and examination

Desirable prerequisites for participation in the courses:

Kenntnis der Module "Einführung in die Programmierung", "Algorithmen und Datenstrukturen", "Softwaretechnik und Programmierparadigmen" und "Grundlagen der Algorithmik".

Knowledge of the modules "Introduction into Programming", "Algorithms and Data Structures", "Software Engineering", and "Foundations of Algorithmics".

Mandatory requirements for the module test application:

No information

Module completion

Grading:	Type of exam:	Language:
graded	Portfolio examination	German/English

Grading scale:
This exam uses its own grading scale (see test description)..

Test description:
No information

Test elements	Categorie		Duration/Extent
No information	practical	25	*No information*
No information	practical	25	*No information*
No information	practical	25	*No information*
No information	practical	25	*No information*

Duration of the Module

This module can be completed in one semester.

Maximum Number of Participants

The maximum capacity of students is 15

Registration Procedures

Die Anmeldung erfolgt über QISPOS (für BSc Informatik) bzw. direkt beim Prüfungsamt.

Please register at QISPOS or directly at the examination office.

Recommended reading, Lecture notes

Lecture notes:
unavailable

Electronical lecture notes :
available

Additional information:
Slides will be made available during the lecture period: www.isis.tu-berlin.de

Assigned Degree Programs

This module is used in the following modulelists:

Computer Engineering (Master of Science)
- StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Computer Science (Informatik) (Master of Science)
- StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Elektrotechnik (Master of Science)
- StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Elektrotechnik/Informationstechnik als Quereinstieg (Lehramtsbezogen) (Master of Education)
- Anforderungen für die Fachwissenschaften - Anlage 3 - StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- M.Ed. Elektrotechnik/Informationstechnik als Quereinstieg_StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Informatik (Bachelor of Science)
- StuPO 2013
  - Modullisten der Semester: SS 2017
- BSc Informatik StuPO 2014
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Informationstechnik (Lehramtsbezogen) (Master of Education)
- Kernfach StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- Zweitfach StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Informationstechnik (Lehramtsbezogen) (Bachelor of Science)
- Kernfach StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- Zweitfach StuPO 2016
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Technische Informatik (Bachelor of Science)
- StuPO 2013
  - Modullisten der Semester: SS 2017 WS 2017/18
- BSc Technische Informatik StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Technische Informatik (Master of Science)
- StuPO 2013
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Wirtschaftsinformatik (Bachelor of Science)
- StuPO 2013
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- BSc Wirtschaftsinformatik StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

Wirtschaftsinformatik / Information Systems Management (Master of Science)
- StuPO 2013
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018
- StuPO 2017
  - Modullisten der Semester: WS 2017/18 SS 2018

Wirtschaftsingenieurwesen (Master of Science)
- StuPO 2015
  - Modullisten der Semester: SS 2017 WS 2017/18 SS 2018

No information

Miscellaneous

No information