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

Workload and Credit Points

The Workload of the module sums up to 270.0 Hours. Therefore 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:
Knowledge of the modules "Einführung in die Programmierung", "Algorithmen und Datenstrukturen", "Softwaretechnik und Programmierparadigmen" and "Grundlagen der Algorithmik".


Mandatory requirements for the module test application:
No information

Module completion
Grading: graded
Type of exam: Portfolio examination
Language: German/English
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:
<table>
<thead>
<tr>
<th>Degree/Program</th>
<th>StuPO Year</th>
<th>Modules of the Semesters</th>
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</thead>
</table>

No information

Miscellaneous
No information