



Economics and Computation

Module title:

Economics and Computation

Credits:

6

Responsible person:

Niedermeier, Rolf

Office:

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Contact person:

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Website:<http://www.akt.tu-berlin.de/menue/teaching/>**Display language:**

English

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Learning Outcomes

On successful completion, students will be able to:

- select and develop models,
- describe and design (efficient) algorithms, as well as
- analyze properties (z.B. computational complexity, existence or stability of solutions, characterizations) for problems arising in the context of collective decision making and related fields.

Content

The course addresses problems at the interface of economics, social choice theory, and computer science. The focus is on processes of algorithmic decision making, such as voting rules or fair division. We discuss fundamental concepts from collective decision making and related topics and investigate algorithmic and computational aspects.

Specific topics include:

- aggregating preferences (rank aggregation) and voting,
- algorithmic game theory,
- cake cutting protocols,
- fair allocation of recourses,
- judgment aggregation,
- opinion diffusion, and
- stable matching.

Module Components

Course Name	Type	Number	Cycle	SWS
Economics and Computation	IV	0434 L 240	WS	4

Workload and Credit Points

Economics and Computation (Integrierte Veranstaltung)	Multiplier	Hours	Total
Attendance	15.0	4.0h	60.0h
Preparation and follow-up	15.0	6.0h	90.0h
			150.0h
Course-independent workload	Multiplier	Hours	Total
Exam preparation	1.0	30.0h	30.0h
			30.0h

The Workload of the module sums up to 180.0 Hours. Therefore the module contains 6 Credits.

Description of Teaching and Learning Methods

The course material is presented in lectures. The lectures are accompanied by tutorials in which an active participation and homework is required.

Requirements for participation and examination

Desirable prerequisites for participation in the courses:

Basic knowledge about algorithms and computational complexity.

Mandatory requirements for the module test application:

No information

Module completion

Grading: graded	Type of exam: Written exam	Language: English	Duration/Extent: 90 min
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Duration of the Module

This module can be completed in one semester.

Maximum Number of Participants

This module is not limited to a number of students.

Registration Procedures

Please register at QISPOS or directly at the examination office.

Recommended reading, Lecture notes

Lecture notes:

unavailable

Electronical lecture notes :

available

Recommended literature:

F. Brandt, V. Conitzer, U. Endriss, J. Lang, and A. D. Procaccia, ed.: Handbook of Computational Social Choice. Cambridge University Press, 2015.

J. Rothe, ed.: Economics and Computation. An Introduction to Algorithmic Game Theory, Computational Social Choice, and Fair Division. Springer, 2015

Y. Shoham, K. Leyton-Brown: Multiagent Systems. Cambridge University Press, 2009.

Assigned Degree Programs

This module is used in the following modulelists:

Computer Engineering (Master of Science)

StuPO 2015

Modullisten der Semester: WS 2018/19

Computer Science (Informatik) (Master of Science)

StuPO 2015

Modullisten der Semester: WS 2018/19

Elektrotechnik (Master of Science)

StuPO 2015

Modullisten der Semester: WS 2018/19

Wirtschaftsinformatik / Information Systems Management (Master of Science)

StuPO 2017

Modullisten der Semester: WS 2018/19

Wirtschaftsingenieurwesen (Master of Science)

StuPO 2015

Modullisten der Semester: WS 2018/19

Miscellaneous

No information