

Module Handbook

TUK MODHB Homepage

Module INF-56-52-M-6

Advanced Automata Theory (M, 8.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
INF-56-52-M-6	<i>Advanced Automata Theory</i>	8.0 CP (240 h)

Basedata

CP, Effort	8.0 CP = 240 h
Position of the semester	1 Sem. in SuSe
Level	[6] Master (General)
Language	[EN] English
Module Manager	Lin, Anthony, Prof. Dr. (PROF DEPT: INF)
Lecturers	Neider, Daniel, Dr. (WMA DEPT: INF)
Area of study	[INF-ALG] Algorithmics and Deduction
Reference course of study	[INF-88.79-SG] M.Sc. Computer Science
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
4V+2U	INF-56-52-K-6	P	U-Schein	PL1	8.0	SuSe

- About [INF-56-52-K-6]: Title: "Advanced Automata Theory"; Presence-Time: 84 h; Self-Study: 156 h
- About [INF-56-52-K-6]: The study achievement "[U-Schein] proof of successful participation in the exercise classes (ungraded)" must be obtained.
 - It is a [prerequisite for the examination](#) for PL1.

Examination achievement PL1

- Form of examination: **written exam (Klausur) (60-180 Min.)**
- Examination Frequency: Examination only within the course
- Examination number: 65652 ("Advanced Automata Theory")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [INF-56-52-K-6] Advanced Automata Theory:

- finite-state systems:
 - omega automata
 - MSO and Büchi theorem
 - LTL and Presburger Arithmetic
- Recursive programs:
 - pushdown automaton, pre* and post*
 - Bounded Context Switching
 - Tree automata, Rabin theorem
- Parameterized systems:
- Regular Model Checking
- LTL(MSO)
- Quotients, abstraction and extrapolation

Competencies / intended learning achievements

Upon successful completion of the module, students will be able to

- model reactive systems with automata,
- specify the correctness with logical formulas,
- derive verification algorithms,
- transfer the procedures to similar system models.

Literature

From [INF-56-52-K-6] Advanced Automata Theory:

Will be announced during the lecture.

Requirements for attendance of the module (informal)

None

Requirements for attendance of the module (formal)

None

References to Module / Module Number [INF-56-52-M-6]

Course of Study	Section	Choice/Obligation
[INF-88.79-SG] M.Sc. Computer Science	[Core Modules (non specialised)] Computer Science Theory	[WP] Compulsory Elective
[INF-88.79-SG] M.Sc. Computer Science	[Core Modules (non specialised)] Formal Fundamentals	[WP] Compulsory Elective
[INF-88.79-SG] M.Sc. Computer Science	[Specialisation] Specialization 1	[WP] Compulsory Elective
[MAT-88.105-SG] M.Sc. Mathematics	[Subsidiary Topic] Subsidiary Topic (Minor)	[WP] Compulsory Elective