Theory of Computer Science A1. Organizational Matters

Gabriele Röger

University of Basel

February 17, 2020

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Theory of Computer Science

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Theory of Computer Science February 17, 2020 — A1. Organizational Matters

A1.1 Organizational Matters

A1.2 About this Course

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Theory of Computer Science

A1.1 Organizational Matters

People

Lecturer

Dr. Gabriele Röger

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People

Tutors Patrick Ferber email: patrick.ferber@unibas.ch office: room 04.001, Spiegelgasse 5 Florian Pommerening email: florian.pommerening@unibas.ch office: room 04.005, Spiegelgasse 1

Time & Place

Lectures

- Monday: 13:15–16:00
- ► Wednesday: 16:15–18:00
- Room 05.002, Spiegelgasse 5

Time & Place



important: please send me an email with your preferred language until Wednesday 23:59 (February 19).

Revised Course Format



5 hours of lectures every week?!?

- more hands-on experience during the lectures
- bring pen & paper or tablet
- no increase of content
- overall time unchanged (now 5+1, previously 4+2)

Theory Course on the Web

Course Homepage

- course information
- slides
- exercise sheets and additional material

enrolment:

- https://services.unibas.ch/
- deadline: March 16
- better today, so that you get all relevant emails

Course Material

course material:

- slides (online)
- textbooks (see next slides)
- additional material on request

Course Material

Textbooks (German)

- Logik f
 ür Informatiker by Uwe Sch
 öning (5th edition)
 - covers the part on logic, but also advanced topics beyond the scope of the course
- Theoretische Informatik kurz gefasst by Uwe Schöning (5th edition)
 - covers large parts of the course, but not the part on logic



Course Material

Textbooks (English)

- Logic for Computer Scientists by Uwe Schöning (1st edition)
 - covers the part on logic, but also advanced topics beyond the scope of the course
- Introduction to the Theory of Computation by Michael Sipser (3rd edition)
 - covers large parts of the course, but not the part on logic



Target Audience

target audience:

- B.Sc. Computer Science, 4th semester
- B.A. Computer Science, 4th or 6th semester as an elective or if interested in M.Sc. Computer Science degree
- all other students welcome

prerequisites:

- basic proof techniques (mathematical induction, proof by contradiction, ...)
- basic programming skills

Exam

written exam, 8 ECTS credits

- June 10, 14:00–16:00
- Vesalianum, large lecture hall (EO. 16)
- admission to exam: no prerequisites
- must register for exam during March 30 April 14 ~> see https://philnat.unibas.ch/de/examen/
- grade for course determined exclusively by the exam
- if you fail: one repeat attempt in FS 2021

Exercises

Exercise sheets (homework assignments):

- mostly theoretical exercises
- some programming exercises

Exercise sessions:

- (live exercises)
- questions about exercise sheets
- questions about the course
- participation voluntary but recommended

Exercises

- exercise sheets on course homepage every Wednesday
- ▶ may be solved in groups of arbitrary size (recommended: 2–3)
- due Wednesday the following week (upload to Adam at https://adam.unibas.ch/)
- scans must be legible (no photos, please)
- ► we appreciate LATEX submissions

Questions on Organization



Questions?

A1.2 About this Course

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Content: Theoretical foundations of computer science

- A. background
 - \triangleright mathematical foundations and proof techniques
- B. logic (Logik)
 - How can knowledge be represented? How can reasoning be automated?
- C. automata theory and formal languages (Automatentheorie und formale Sprachen)▷ What is a computation?
- D. Turing computability (Turing-Berechenbarkeit)▷ What can be computed at all?
- E. complexity theory (Komplexitätstheorie)
 - ▷ What can be computed efficiently?
- F. more computability theory (mehr Berechenbarkeitheorie)▷ Other models of computability

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Learning Goals

- understanding the capabilities and limitations of computers
- working with formal systems
 - comprehending formal definitions and theorems
 - precise formulation of definitions, theorems and proofs
 - analyzing formal problems precisely
 - differentiating statements within a system from statements about a system

A1. Organizational Matters

Warning

"Wer's nicht gewohnt ist, für den ist es ungewohnt." (Prof. Dr. Th. Ottmann) [If you are not used to it, it may be unusual for you.]



What can you do?

- stay on the ball
- do the exercises
- pay attention to details
- ask questions!

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A1. Organizational Matters

Questions about the Course



Questions?