Theory of Computer Science

A1. Organizational Matters

Gabriele Röger

University of Basel

February 18, 2019

Organizational Matters

People

Lecturer

Dr. Gabriele Röger

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- office: room 04.005, Spiegelgasse 1

People

Tutors

Salomé Eriksson

- email: salome.eriksson@unibas.ch
- office: room 04.001, Spiegelgasse 5

Cedric Geissmann

- email: cedric.geissmann@unibas.ch
- office: room 04.001, Spiegelgasse 5

Time & Place

Lectures

- Monday: 14:15–16:00
- Wednesday: 16:15–18:00

Room 05.002, Spiegelgasse 5

Time & Place

Exercise Sessions (starting February 25)

- group 1 (Cedric Geissmann; in German?)
  - time: Monday 16:15–18:00
  - place: room 00.003, Spiegelgasse 1
- group 2 (Salomé Eriksson; in English)
  - time: Monday 16:15–18:00
  - place: room U1.001, Spiegelgasse 1

important: please send me an email with your preferred language until Wednesday 23:59 (February 20).

Theory Course on the Web

Course Homepage

- course information
- slides
- exercise sheets and additional material

enrolment:

- `https://services.unibas.ch/`
- deadline: March 18
- 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

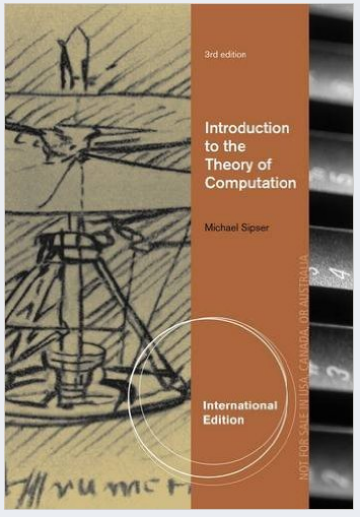
Textbooks (German)

- Logik für Informatiker
  by Uwe Schöning (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 12, 14:00–16:00
- admission to exam: no prerequisites
- must register for exam during April 1–15
  $\rightsquigarrow$ see `https://philnat.unibas.ch/de/examen/`
- grade for course determined exclusively by the exam
- if you fail: one repeat attempt in FS 2020

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 highly 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 Courses at `https://courses.cs.unibas.ch/`)
- scans must be legible (no photos, please)
- we appreciate LaTeX submissions

Plagiarism

Plagiarism (Wikipedia)

Plagiarism is the "wrongful appropriation" and "stealing and publication" of another author's "language, thoughts, ideas, or expressions" and the representation of them as one's own original work.

consequences:

- 0 marks for the exercise sheet (first time)
- exclusion from exam (second time)

if in doubt: check with us what is (and isn't) OK before submitting

exercises too difficult? we are happy to help!

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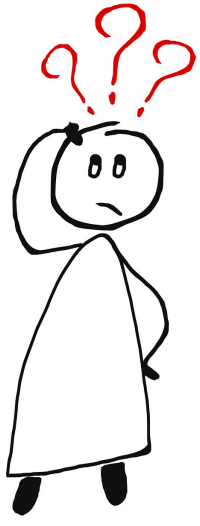
Questions on Organization



Questions?

About this Course

Content: Theoretical foundations of computer science

A. background
   - ▷ 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

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

Warning

"Wer's nicht gewohnt ist,
für den ist es ungewohnt."
(Prof. Dr. Th. Ottmann)
[If you are not used to it,
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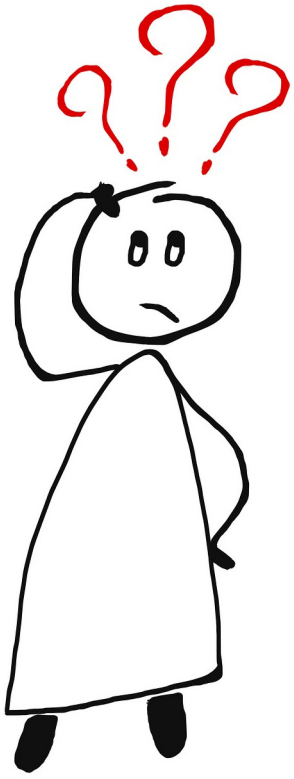
What can you do?

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

Questions about the Course



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