

# Theory of Computer Science

## A1. Organizational Matters

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University of Basel

February 18, 2019

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## February 18, 2019 — A1. Organizational Matters

### A1.1 Organizational Matters

### A1.2 About this Course

## A1.1 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)

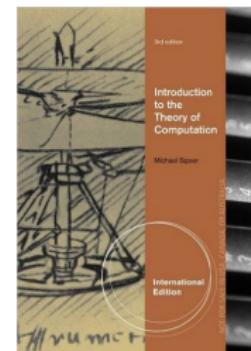
- ▶ Logik für Informatiker  
by Uwe Schöning (5th edition)
  - ▶ covers the **part on logic**,  
but also advanced topics  
beyond the scope of the course
- ▶ Theoretische Informatik – kurz gefasst  
by Uwe Schöning (5th edition)
  - ▶ covers **large parts** of the course,  
but not the part on logic



# 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  
~~ 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  $\text{\LaTeX}$  submissions

# Plagiarism

## Plagiarism (Wikipedia)

*Plagiarism is the “wrongful appropriation” and “unacknowledged use” of another author’s “language, thoughts, ideas, or expressions, and the representation of them as one’s own original work.”*

### consequences:

- ▶ 0 marks for exercise sheet (first time),  
-10% from exam (second time)

No doubt: check with us what is (and isn't) OK **before submitting**

exercises too difficult? we are happy to help!

# Questions on Organization



## A1.2 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 Berechenbarkeitstheorie)

- ▷ 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,  
it may be unusual for you.]



What can you do?

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

# Questions about the Course

