

# Part I

## Organizational Matters

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- ▶ **Modul: IN2003**
- ▶ Name: “Efficient Algorithms and Data Structures”  
“Effiziente Algorithmen und Datenstrukturen”
- ▶ ECTS: 8 Credit points
- ▶ Lectures:
  - ▶ 4 SWS
    - Mon 10:00–12:00 (Room Interim2)
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- ▶ Webpage: <http://www14.in.tum.de/lehre/2018WS/ea/>

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▶ **Required knowledge:**

▶ IN0001, IN0003

“Introduction to Informatics 1/2”

“Einführung in die Informatik 1/2”

▶ IN0007

“Fundamentals of Algorithms and Data Structures”

“Grundlagen: Algorithmen und Datenstrukturen” (GAD)

▶ IN0011

“Basic Theoretic Informatics”

“Einführung in die Theoretische Informatik” (THEO)

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# The Lecturer

- ▶ Harald Räche
- ▶ Email: [raecke@in.tum.de](mailto:raecke@in.tum.de)
- ▶ Room: 03.09.044
- ▶ Office hours: (by appointment)

# Tutorials

**A01** Monday, 12:00–14:00, 00.08.038 (Lederer)

**A02** Monday, 12:00–14:00, 00.09.038 (Stotz)

**A03** Monday, 14:00–16:00, 02.09.023 (Lederer)

**B04** Tuesday, 10:00–12:00, 00.08.053 (Czerner)

**D05** Thursday, 10:00–12:00, 03.11.018 (Stotz)

**E06** Friday, 12:00–14:00, 00.13.009 (Czerner)

# Assignment sheets

In order to pass the module you need to pass an exam.

# Assessment

## Assignment Sheets:

- ▶ An assignment sheet is usually made available on Monday on the module webpage.
- ▶ Solutions have to be handed in in the following week before the lecture on Monday.
- ▶ You can hand in your solutions by putting them in the mailbox "Efficient Algorithms" on the basement floor in the MI-building.
- ▶ Solutions have to be given in English.
- ▶ Solutions will be discussed in the tutorial of the week when the sheet has been handed in, i.e, sheet may not be corrected by this time.
- ▶ You should submit solutions in groups of up to 2 people.



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## Assignment Sheets:

- ▶ Submissions must be handwritten by a member of the group. Please indicate who wrote the submission.
- ▶ Don't forget name and student id number for each group member.

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Assignment can be used to improve you grade

## Requirements for Bonus

- ▶ 50% of the points are achieved on submissions 2-8,
- ▶ 50% of the points are achieved on submissions 9-14,
- ▶ each group member has written at least 4 solutions.



# 1 Contents

- ▶ Foundations
  - ▶ Machine models
  - ▶ Efficiency measures
  - ▶ Asymptotic notation
  - ▶ Recursion
- ▶ Higher Data Structures
  - ▶ Search trees
  - ▶ Hashing
  - ▶ Priority queues
  - ▶ Union/Find data structures
- ▶ Cuts/Flows
- ▶ Matchings

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## 2 Literatur

-  Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman:  
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-  Thomas H. Cormen, Charles E. Leiserson, Ron L. Rivest,  
Clifford Stein:  
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*The art of computer programming. Vol. 3: Sorting and Searching,*

3. Auflage, Addison-Wesley, 1997



Christos H. Papadimitriou, Kenneth Steiglitz:

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Prentice Hall, 1982



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Spektrum Akademischer Verlag, 2001



Steven S. Skiena:

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