

Part I

Organizational Matters

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- ▶ Modul: IN2003

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- ▶ Name: “Efficient Algorithms and Data Structures”
“Effiziente Algorithmen und Datenstrukturen”

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- ▶ ECTS: 8 Credit points

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- ▶ Lectures:
 - ▶ 4 SWS
Mon 10:00–12:00 (Room Interim2)
Fri 10:00–12:00 (Room Interim2)

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Mon 10:00–12:00 (Room Interim2)
Fri 10:00–12:00 (Room Interim2)
- ▶ Webpage:
<https://www.moodle.tum.de/course/view.php?id=80009>

▶ Required knowledge:

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 - ▶ IN0001, IN0003
 - ▶ **“Introduction to Informatics 1/2”**
 - ▶ “Einführung in die Informatik 1/2”

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“**Introduction to Informatics 1/2**”
“Einführung in die Informatik 1/2”
 - ▶ IN0007
“**Fundamentals of Algorithms and Data Structures**”
“Grundlagen: Algorithmen und Datenstrukturen” (GAD)

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“Grundlagen: Algorithmen und Datenstrukturen” (GAD)
 - ▶ IN0011
 - ▶ **“Basic Theoretic Informatics”**
“Einführung in die Theoretische Informatik” (THEO)

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 - ▶ IN0011
“**Basic Theoretic Informatics**”
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 - ▶ IN0015
“**Discrete Structures**”
“Diskrete Strukturen” (DS)

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 - ▶ **“Fundamentals of Algorithms and Data Structures”**
“Grundlagen: Algorithmen und Datenstrukturen” (GAD)
 - ▶ IN0011
 - ▶ **“Basic Theoretic Informatics”**
“Einführung in die Theoretische Informatik” (THEO)
 - ▶ IN0015
 - ▶ **“Discrete Structures”**
“Diskrete Strukturen” (DS)
 - ▶ IN0018
 - ▶ **“Discrete Probability Theory”**
“Diskrete Wahrscheinlichkeitstheorie” (DWT)

The Lecturer

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

- ▶ Omar AbdelWanis
- ▶ omar.abdelwanis@in.tum.de
- ▶ Room: 03.09.042
- ▶ Office hours: (by appointment)

One centralized tutorial session.

Wednesday, 14:00-16:00

<https://tum-conf.zoom.us/j/63875503821>

Meeting ID: 638 7550 3821

Passcode: 719434

1 Contents

- ▶ Foundations
 - ▶ Machine models
 - ▶ Efficiency measures
 - ▶ Asymptotic notation
 - ▶ Recursion

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 - ▶ Hashing
 - ▶ Priority queues
 - ▶ Union/Find data structures




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- ▶ Cuts/Flows
- ▶ Matchings

2 Literatur

-  Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman:
The design and analysis of computer algorithms,
Addison-Wesley Publishing Company: Reading (MA), 1974
-  Thomas H. Cormen, Charles E. Leiserson, Ron L. Rivest,
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2 Literatur

-  Ronald L. Graham, Donald E. Knuth, Oren Patashnik:
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2. Auflage, Addison-Wesley, 1994
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2. Auflage, Vieweg, 2003
-  Jon Kleinberg, Eva Tardos:
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-  Donald E. Knuth:
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3. Auflage, Addison-Wesley, 1997

2 Literatur



Donald E. Knuth:

The art of computer programming. Vol. 3: Sorting and Searching,

3. Auflage, Addison-Wesley, 1997



Christos H. Papadimitriou, Kenneth Steiglitz:

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