Advanced Algorithms

Nicole Megow (Universität Bremen)

SoSe 2025
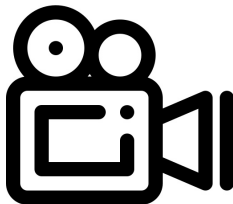
Organization

April 7, 2025

Recording of this Lecture

This lecture will be recorded

- ▶ Recording only of the lecturers by themselves.

- ▶ If there are questions from the audience, please make a clear signal if the microphone shall be muted.

- ▶ Our goal is to record the lecture, but it is no guarantee that each lecture will be recorded.
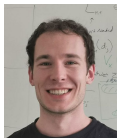
Introduction

Lecture

▶ **Prof. Dr. Nicole Megow**
  AG Kombinatorische Optimierung
  https://www.uni-bremen.de/en/cslog

▶ with Dr. Felix Hommelsheim and Dr. Alexander Lindermayr

Exercises

▶ Bart Zondervan

Organisation

Advanced Algorithms 03-IBAT-ALG Advanced Algorithms

Lectures 2 SWS + Exercises 2 SWS
6 ETCS-Points

Requirement:

- ▶ Theoretical Computer Science
- ▶ in particular: Algorithm Theory ('Algorithmentheorie')

Dates

Lectures (weekly):
- Mondays 12:15 – 13:45 MZH 1470

Exercises (weekly):
- Wednesdays 08:15 – 09:45 MZH 1100

Important Note:
- Sometimes the Monday slot (lecture) is a holiday, e.g., Easter Monday. Then we will do the lecture in the exercise slot and skip 1 exercise (also the exercise sheet). We announce this 1-2 weeks in advance.

Exam:
- Oral Exam: probably 2 possibilities at start and end of semester break (will be announced in advance)

Exercises

Contents and purpose

- Application and consolidation of the lecture content
- You solve the exercises at home
- Discussion of exercise sheets
    - → engage actively and ask questions!

Exercise sheets (you solve them at home)

- Every week there is one exercise sheet (exercise sheet 0 and 1 are online; no grading for exercise sheet 0)
- Appears every Monday in STUD.IP
- Submission: One week later, Mondays before the lecture at 11:59 am in STUD.IP
- First submission: Monday, April 14, 2025 at 11:59 am
- You can hand in in groups of up to 2 students (you need to be registered as a group in STUD.IP)

Grading

Grading by Oral Exam

▶ **Admission for oral exam**:
you have to receive at least 50% of the possible points in the
exercise sheets

▶ **Bonus for the grading**:
Improvement of the grade of a passed exam by one grade level if
at least 75% of the points were achieved.

Grades 1.0 and 5.0 cannot be improved.

Only applies in the current semester.

▶ Roughly 10 exercise sheets with 20 points each.

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Own work/plagiarism

The following applies when solving the exercises.

▶ The solutions must have been worked out by yourselves (in the group).

▶ You are of course allowed to read textbooks, for example, and discuss the tasks with other students.

▶ You still have to come up with your own solution/formulation. If you use parts of the solution from external sources, you must indicate – otherwise it is an attempt to cheat!

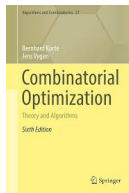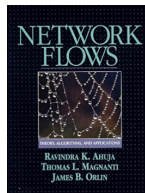▶ We can only evaluate your own contribution and this must be recognizable.

Course Material and Literature

Lecture:

▶ Slides and videos will usually be uploaded weekly in **STUD.IP**
  Being present in the lectures and exercises is important!

Literature:

▶ *Network Flows: Theory, Algorithms, and Applications*, Ahuja, Magnanti, Orlin, Prentice Hall

▶ *Combinatorial Optimization*, Korte, Vygen, Springer Verlag

▶ *Combinatorial Optimization: Polyhedra and Efficiency*, Schrijver, Springer Verlag

Questions?