

# Algorithms and Games

716.121 1 $\frac{1}{2}$  VU Algorithmen und Spiele:

- Flipped Classroom: slides and videos online (TC)
- Discussion sessions in presence in the lecture hall i12, Tuesday 10:15-11:22 $\frac{1}{2}$
- Additional material: Will be provided in the discussion sessions, TeachCenter (web page, TUBE ...)
- Additional communication with the TAs: TC Forum

# Algorithms and Games - Topics

- Basic Algorithms for 2-Player Games:
  - Search- / decision trees
  - MinMax-Algorithm
  - $\alpha$ - $\beta$ -pruning
  - Complexity of search-tree vs. state-space complexity
- 2-Player Zero-Sum Games (Connect 4 (Vier Gewinnt), Nine Men's Morris (Mühle), ...)
- Nimber-theory and NIM-type games
- Optimal solutions for NIM-type games

# Discussion Sessions

- Main discussion sessions on Tuesdays start at 10:15, in lecture hall i12, participation is strongly recommended
- There questions can be asked/discussed, additional examples can be discussed, hints are given etc.
- If needed (for partial exams, practical parts): additional discussion sessions with teaching assistants

# Grading

- There will be 2 partial exams (Teilklausuren, each 15%) and 2 homework assignments (each 10%) and a practical part (15% plus 35%) during the term.
- Grading key:

Grade	Percent
Sehr gut (1)	87.51% to 100% (and above)
Gut (2)	75.01% to 87.50%
Befriedigend (3)	62.51% to 75.00%
Genügend (4)	50.01% to 62.50%

# Partial exams

- The two partial exams will be held during the regular lecture time on Tuesday.
- Partial exams take place in presence.
- Dates: 2023-11-21; 2024-01-23
- In case you are sick, you need a doctor's confirmation (Arztbestätigung) which you provide once you are healthy again. A replacement exam is only possible with this confirmation.

# Homework assignments

- Homework will be assigned during the lecture depending on the progress in the course. Currently planned dates are 2023-10-17 and 2023-12-12.
- The week afterwards you can ask questions concerning the assignment during the discussion hour.
- The homework has to be signed in via TeachCenter.
- Additional question hours and inspection hours with teaching assistants will be provided.
- More details will be given with the first homework assignment.

# Practical Part

- For the practical part you will work in groups of up to 5 people, implementing a 2-player game.
- The game to implement this year is Teeko, see extra slides for details (presented next week).
- We will use a special system so that all programs can play against each other in tournaments.
- Grading consists of two phases: (1) A working program (15%), and (2) a *good* playing program (35%).
- More details on the practical part, especially the system we use, follow in the second class (next week).

# A few basic hints ...

- This lecture is a VU (lecture with permanent examination) and according to the study law, attendance is mandatory. However, the material of the course will be available online.
- The discussion sessions are strongly recommended. They are intended for those who are interested in the subject, want to really understand it and/or have content questions.
- You are allowed (and encouraged) to discuss the topics of practicals and homework assignments, but the work has to be done by your own.



# A few basic hints ...

- The purpose of practicals and homework assignments is that you deepen the understanding of the lecture material. Just solving the task is NOT the goal.
- For that reason there will be oral interviews for practicals (with the whole group) and homework assignments (individual).
- We treat the involvement of ChatGPT and similar tools the same way as the involvement of another natural person. That is, for involvement that qualifies as plagiarism or an impermissible level of assistance, the consequences will be the same in both cases.