

# Foundations of Artificial Intelligence

## 0. Organizational Matters

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University of Basel

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# Organizational Matters

# People: Lecturer

## Lecturers

Prof. Dr. Malte Helmert

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- **office:** room 06.004, Spiegelgasse 1



# People: Assistant

## Assistant

Dr. Salomé Eriksson

- **email:** `salome.eriksson@unibas.ch`
- **office:** room 04.002, Spiegelgasse 1



# People: Tutors

## Tutors

Clemens Büchner

- **email:** `clemens.buechner@unibas.ch`
- **office:** room 04.001, Spiegelgasse 5



Patrick Ferber

- **email:** `patrick.ferber@unibas.ch`
- **office:** room 04.001, Spiegelgasse 5



# Time & Place

## Lectures

- **time:** Mon 16:15–18:00, Wed 14:15–16:00
- **place:** Zoom

## Exercise Sessions

- **time:** Wed 16:15–18:00
- **place:** Zoom

first exercise session: March 10

# AI Course on the Internet (1)

## Course Homepage

`https://dmi.unibas.ch/en/academics/computer-science/courses-in-spring-semester-2021/lecture-foundations-of-artificial-intelligence/`

- course information
- slides
- exercise sheets and materials
- bonus materials (not relevant for the exam)
- link to ADAM workspace

### enrolment:

- `https://services.unibas.ch/`

# AI Course on the Internet (2)

## Other Channels

- ADAM workspace (linked from course homepage)
  - link to Zoom for lectures and exercises
  - link to SWITCHtube channel with recorded lectures
  - link to Discord
  - forum for Q&A and official announcements
- Discord server (linked from ADAM workspace)
  - opportunity for Q&A and informal interactions
- contact us by email
- talk to us via Zoom (by arrangement)



# Course Material

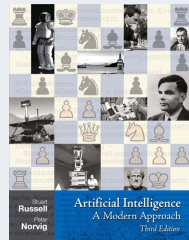
## course material:

- slides (presentation and print versions)
- textbook
- additional material **on request**

## Textbook

Artificial Intelligence: A Modern Approach  
by Stuart Russell and Peter Norvig  
(**3rd edition**)

- available at Karger Libri
- covers **large parts** of the course,  
but not everything



# Target Audience

## target audience:

- Bachelor Computer Science, ~3rd year
- Bachelor Computational Sciences, ~3rd year
- other students welcome

## prerequisites:

- algorithms and data structures
- basic mathematical concepts  
(formal proofs; sets, functions, relations, graphs)
- complexity theory
- programming skills (mainly for exercises)

# Exam

- **written exam** on Wed, June 16
  - 120 minutes (to be confirmed)
  - time and place to be announced
- 8 ECTS credits
- admission to exam: 50% of the exercise marks
- **no repeat exam**

# Exercises

exercise sheets (homework assignments):

- mostly theoretical exercises
- occasional programming exercises

exercise sessions:

- discussion of exercise sheets
- questions about the course
- participation voluntary but highly recommended

# Theoretical Exercises

## theoretical exercises:

- exercises on course homepage every Wednesday
- solved in **groups of at most two** ( $2 = 2$ )
- due Wednesday of following week (23:59) via Courses

# Programming Exercises

## programming exercises (project):

- project with 3–4 parts over the duration of the semester
- solved in **groups of at most two** ( $2 < 3$ )
- **programming languages? operating systems?**
- solutions that obviously do not work: 0 marks

# Plagiarism

## Plagiarism (Wikipedia)

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

consequences:

- 0 marks for the exercise sheet (first time)
- exclusion from exam (second time)

if in doubt: check with us what is (and isn't) OK before submitting exercises too difficult? we are happy to help!

# About this Course



# AI in Basel

- research group **Artificial Intelligence** (AI) at the DMI exists since June 2011
- researchers:
  - Prof. Dr. Malte Helmert
  - Dr. Liat Cohen
  - Dr. Salomé Eriksson
  - Dr. Thomas Keller
  - Dr. Florian Pommerening
  - Dr. Gabriele Röger
  - Dr. Silvan Sievers
  - Clemens Büchner
  - Augusto B. Corrêa
  - Patrick Ferber
- <https://ai.dmi.unibas.ch/>

# Research Groups of the Computer Science Section

## research area “Distributed Systems”:

- High Performance Computing (F. Ciorba)
- Databases and Information Systems (H. Schuldt)
- Computer Networks (C. Tschudin)

## research area “Machine Intelligence”:

- **Artificial Intelligence (M. Helmert)**
- Biomedical Data Analysis (V. Roth)
- Graphics and Vision (T. Vetter)

## between both research areas:

- Data Analytics (I. Dokmanić)

# Classical AI Curriculum

## “Classical” AI Curriculum

1. introduction
2. rational agents
3. uninformed search
4. informed search
5. constraint satisfaction
6. board games
7. propositional logic: foundations
8. propositional logic: satisfiability
9. predicate logic
10. modeling with logic
11. machine learning
12. classical planning
13. probabilistic reasoning
14. reasoning under uncertainty
15. decisions under uncertainty
16. acting under uncertainty

# Classical AI Curriculum

## “Classical” AI Curriculum

- |  |                                 |
|--|---------------------------------|
| 1. introduction                        | 9. predicate logic              |
| 2. rational agents                     | 10. modeling with logic         |
| 3. uninformed search                   | 11. machine learning            |
| 4. informed search                     | 12. classical planning          |
| 5. constraint satisfaction             | 13. probabilistic reasoning     |
| 6. board games                         | 14. reasoning under uncertainty |
| 7. propositional logic: foundations    | 15. decisions under uncertainty |
| 8. propositional logic: satisfiability | 16. acting under uncertainty    |

↪ wide coverage, but somewhat superficial

# Our AI Curriculum

## Our AI Curriculum

1. introduction
2. rational agents
3. uninformed search
4. informed search
5. constraint satisfaction
6. board games
7. propositional logic: foundations
8. propositional logic: satisfiability
9. ~~predicate logic~~
10. ~~modeling with logic~~
11. ~~machine learning~~
12. ~~classical planning~~
13. ~~probabilistic reasoning~~
14. ~~reasoning under uncertainty~~
15. ~~decisions under uncertainty~~
16. ~~acting under uncertainty~~

# Topic Selection

guidelines for topic selection:

- fewer topics, **more depth**
- **more emphasis on programming projects**
- **connections** between topics
- avoiding overlap with other courses
  - Pattern Recognition (B.Sc.)
  - Machine Learning (M.Sc.)
- focus on **algorithmic core** of model-based AI

# Under Construction...



- A course is never “done” .
- We are always happy about feedback, corrections and suggestions!