

Artificial Intelligence 1

Prof. Dr. Frank Hopfgartner
Dr. Matthias Horbach

Institute for Web Science and Technologies (WeST)
University of Koblenz

Course aims and requirements

Course aim:

- ▶ The students understand the basic principles behind the symbolic approach to artificial intelligence. They comprehend syntax and semantics of formal logics and the need to model intelligent systems through formal models. They are also capable of realising theoretical concepts via the logic programming language Prolog.

Requirements:

- ▶ Bachelor in Computer Science/CV/... with adequate basic knowledge in Computer Science
- ▶ Basic knowledge in logic (as taught in a “Logic for Computer Science” bachelor course), in particular propositional logic and first-order logic
- ▶ Mathematical and algorithmic foundations of graph theory (e. g. depth-first search, breadth-first search)

Overview on the course

1. Classical logics and Prolog
 - 1.1 Classical logics
 - 1.2 Prolog
2. Search and automatic planning
 - 2.1 Uninformed search
 - 2.2 Informed search
 - 2.3 Situation calculus and STRIPS
3. Knowledge representation and reasoning
 - 3.1 Default logic
 - 3.2 Answer set programming
 - 3.3 Formal argumentation
 - 3.4 Belief revision
4. Agents and multi agent systems
 - 4.1 Agent models
 - 4.2 Multi agent logics

About this course

Module number:	04IN2029
Module title:	Artificial Intelligence 1
Module title (German):	Künstliche Intelligenz 1
Lecture type (hours):	Lecture (2 hours) Tutorials (2 hours)
Credit points:	6

Q&A sessions and assignments

Matthias Horbach (mhorbach@uni-koblenz.de)

Tutorials

Elina Unruh (elina@uni-koblenz.de)

Overall responsibility

Frank Hopfgartner (hopfgartner@uni-koblenz.de)

Lectures

- ▶ First session will take place as BBB meeting on 20 April 2023 between 4-6pm. A recording will be made available afterwards.
- ▶ Starting from 27 April 2023, lecture recordings will be made available on OLAT. It is your responsibility to engage with these teaching materials.
- ▶ We offer online Q&A sessions on 25 May and 29 June where you can ask questions about the lecture content.

Tutorials

- ▶ Every Wednesday in M001 between 6-8pm
- ▶ First tutorial will be on 3 May 2023

Weekly Assignments 1/3

- ▶ Exercise sheets are published weekly on OLAT
- ▶ Assignments released on Wednesdays at 6pm
- ▶ Submission (upload to Group SVN) by the following Tuesday at 11:59pm (midnight)
- ▶ There will be roughly 10 exercise sheets in total.

- ▶ Group work (max. four students per group). Registration via Teams! until 26 April
- ▶ Teams of less than three persons are not allowed.
- ▶ When submitting solutions, all names of collaborators have to be written on the first page
- ▶ You will submit solutions by uploading them to SVN:

`https://svn.uni-koblenz.de/westteaching/ai23/aho`

(or babbage, backus ... instead of aho)

- ▶ Structure of tutorials:
 - ▶ Solutions will be presented
 - ▶ The tutorials serve as a discussion platform for previously submitted exercise sheets (if time allows, upcoming sheets can be discussed as well)
 - ▶ Participants should actively engage in the tutorials and present their solutions
 - ▶ Any issue with the exercise sheets have to be actively brought forward
- ▶ As we will program with Prolog, it may be a good idea to already install SWI-Prolog and play around a bit / do some small tutorials such that you understand syntax and basic behavior of Prolog.

- ▶ In order to obtain the credits of this course (6 ECTS), you have to obtain admission to take part in the exam and pass the exam.
- ▶ Admission to the exam is granted to all students who achieve 60% of the score obtainable in the exercises of the tutorials.
- ▶ Active participation in the tutorials is expected.
- ▶ Exam eligibility from previous years will *not* be carried over.

- ▶ Obligation to register for the exam
 - ▶ There is an obligation to register for the exam.
 - ▶ If someone is not correctly registered for the exam before the end of the corresponding deadline, he or she cannot participate in the exam.
 - ▶ If someone is registered for the exam but does not show up, he or she will fail the exam.
- ▶ If you fail the (written) exam you have to do a retake within the next 6 months; this second (or third) exam is orally and has to be scheduled with the lecturer via mail.
- ▶ Exam date: July 31, within the time slot 14:00-16:00, in room D028

- ▶ Submitted solutions to exercise sheets are part of the examination process.
- ▶ Solutions have to be prepared independently within the student group and must contain only the group's own work.
- ▶ You are allowed to discuss exercise sheets and potential solutions with other students, but it is explicitly forbidden to copy solutions and code of others.
- ▶ Internet research is allowed but solutions must be phrased in one own's words and code has to be developed by yourself.
- ▶ Also small changes of text and code (such as renaming of variables) still counts as a plagiarism.

- ▶ Plagiarism is a severe academic misconduct and will be punished correspondingly.
- ▶ In case of plagiarism the whole student group will be expelled from the course and the exam (you lose one year); severe cases of plagiarism may be criminally prosecuted.
- ▶ If two student groups have (partially) identical solutions, both groups will be punished as outlined above (so do not share your solutions with others).

General recommendations

- ▶ Attend the lecture
 - ▶ You do not have to understand everything at once, but you have to deal with the topic thoroughly
 - ▶ Taking notes helps significantly
- ▶ Understand the concepts; only memorising formulas is not sufficient
- ▶ Practise by yourself
- ▶ The tutorials are the perfect preparation for the exam

Stuart Russell, Peter Norvig
Artificial Intelligence: A Modern Approach
Third Edition, Prentice Hall, 2010



Christoph Beierle, Gabriele Kern-Isberner
Methoden wissensbasierter Systeme
Vierte Auflage, Vieweg+Teubner, 2008



Ronald Brachman, Hector Levesque
Knowledge Representation and Reasoning
First Edition, Morgan Kaufmann Series, 2004



Gerhard Weiss (Editor)
Multiagent Systems
Second Edition, MIT Press, 2013

