

Syllabus for the Course “*Methods of Artificial Intelligence*”

Part I: Organization

Lecture:	Ute Schmid	
Practice:	Kai-Uwe Kühnberger	
Tutor sessions:	Collin Rogowski Tobias Widdra	
Offices:	AVZ, Room 318 (Schmid) 26/101 (Kühnberger)	
Office Hours:	Appointment (Schmid) Tue 16:00 – 18:00 and appointment (Kühnberger)	
Phones:	0541-969-2558 (Schmid) 0541-969-6228 (Kühnberger)	
e-mail:	Schmid:	schmid@informatik.uni-osnabrueck.de
	Kühnberger:	kkuehnbe@uos.de
	Rogowski:	collin@rogowski.de
	Widdra:	tobias.widdra@gmx.net
Intended Audience:	Cognitive Science Bachelor (second year students)	
Type of Course:	Lectures + Practice sessions + Tutor sessions, 8 ECTS (Cognitive Science)	
Intended Language:	English	
Time of Sessions:	Lecture sessions:	Thu 10-12
	Practice sessions:	Fr 12 am – 2 pm
	Tutor practice sessions:	Thu 12 am – 2 pm (Rogowski) We 2 pm – 4 pm (Widdra)
Rooms:	35/E16 (Lecture) 41/112 (Practice sessions) Additional rooms for the tutorials are provided at the beginning of the second week of the semester. You will be informed by e-mail.	
URL:	For more information concerning the material for the course, assignments etc. students are referred to http://www.vorlesungen.uos.de/informatik/ai02/	

Purpose and Course Objectives: Introduction to basic concepts, methods, and algorithms of artificial intelligence with relations to topics of cognitive science: Problem solving and planning, constraint satisfaction, theorem proving and non-monotonic reasoning, approaches to knowledge representation, machine learning, declarative programming languages. Discussion of current/special topics: Multiagent

systems, cognitive robotics, computer vision, natural language processing. Proposed for students in 3rd or higher semester (prerequisite: basic programming skills (Info A and/or Prolog), Logic or Info D).

Requirements to earn credits:

- Written assignments (homework), 10 assignments in total
- Programming assignments, each must be solved in a specified two week period (3 assignments in total)
- In-class midterm examination (computer-based test)
- In-class final examination (computer-based test)

Grades: Grades are assessed on the basis of the performance of the weekly assignments worth 35% of the final grade, the programming assignments worth 25% of the final grade, the midterm examination worth 15% of the final grade, and the final examination worth 25% of the final grade.

The maximum number of credits of an assignment is 40. Therefore, the total number of credits of the assignment block during the whole semester is 400 ($10 \times 40 = 400$). Each programming assignment is worth 40 credits, i.e. the total number of credits in the programming assignment block is 120 ($3 \times 40 = 120$). Notice: Each credit earned in the assignment block is worth 0.0875% of the final grade. Each credit earned in the programming assignment block is worth approx. 0.208% of the final grade. Hence, they are *not* equally weighted.

In the assignment block and in the programming assignment block, the building of working groups is possible and allowed, provided groups do not exceed maximally two students. Additional credits for the assignment block can be achieved by presenting solutions of an exercise in the practice sessions. Each presentation of a solution is worth 5 credits.

The deadlines for the submission of assignments and programming problems are considered as absolute: late submissions are *not* possible in general. Exceptions are possible and are dealt with on an individual basis. The deadlines for submission of assignments and programming problems will be specified. Programming problems must be submitted online using the MVC tool.

To pass this course students must earn at least 50% of the maximum number of possible credits in the assignment block and 50% of the maximum number of possible credits of the programming problem block as well as at least grade 4.0 (ECTS grade "E") in the midterm examination and the final examination.

Notice: The final examination covers the topics of the whole course. Information concerning regulations, form, duration, and other features of the in-class midterm and final examinations will be provided in lectures and practice sessions during the semester.

The weekly assignments are intended to specify, to deepen, and to apply techniques, theories, and methods that are taught in the lectures as well as to prepare students for the midterm and final examinations.

Recommended Textbook: Compare the webpage of the course for more information:
<http://www.vorlesungen.uos.de/informatik/ai02/>

Part II: Tentative Schedule

First week: 17.10.2002 (Lecture)

- Goals, methods, topics, history of AI
- Practice: Organization

Second week: 24.10.2002 (Lecture)

- Basic definitions, uninformed search
- 1st Assignment (25.10.2002)

Third week: 31.10.2002 (Lecture)

- Heuristic search
- 2nd Assignment (01.11.2002)
- *DUE: 1st Assignment (01.11.2002)*

Fourth week: 07.11.2002 (Lecture)

- Constraint satisfaction
- 3rd Assignment (08.11.2002)
- 1st Programming Assignment (08.11.2002)
- *DUE: 2nd Assignment (08.11.2002)*

Fifth week: 14.11.2002 (Lecture)

- Game playing
- 4th Assignment (15.11.2002)
- *DUE : 3rd Assignment (15.11.2002)*

Sixth week: 21.11.2002 (Lecture)

- Problem reduction and cognitive search processes
- *DUE: 4th Assignment (22.11.2002)*
- *DUE: 1st Programming Problem (22.11.2002)*

Seventh week: 28.11.2002 (Lecture)

- Inference in First-Order Logic
- 5th Assignment (29.11.2002)
- *Midterm examination*

Eighth week: 05.12.2002 (Lecture)

- Basic concepts of theorem proving
- 6th Assignment (06.12.2002)
- 2nd Programming Assignment (06.12.2002)
- *DUE: 5th Assignment (06.12.2002)*

Ninth week: 12.12.2002 (Lecture)

- Non-monotonic reasoning and human reasoning
- 7th Assignment (13.12.2002)
- *DUE: 6th Assignment (13.12.2002)*

Tenth week: 19.12.2002 (Lecture)

- Approaches to knowledge representation and knowledge engineering
- 8th Assignment (20.12.2002)
- *DUE: 7th Assignment (20.12.2002)*
- *DUE: 2nd Programming Assignment (20.12.2002)*

Eleventh week: 09.01.2003 (Lecture)

- Planning
- 9th Assignment (10.01.2003)
- *DUE: 8th Assignment (10.01.2003)*

Twelfth week: 16.01.2003 (Lecture)

- Temporal and spatial reasoning
- 10th Assignment (17.01.2003)
- 3rd Programming Assignment (17.01.2003)
- *DUE: 9th Assignment (17.01.2003)*

Thirteenth week: 23.01.2003 (Lecture)

- Machine Learning: Classification
- *DUE: 10th Assignment (24.01.2003)*

Fourteenth week: 30.01.2003 (Lecture)

- Machine Learning: Control Rule Learning
- *DUE: 3rd Programming Assignment (31.01.2003)*

Fifteenth week: 06.02.2003 (Lecture)

- Current trends in AI
- Final examination