UCLouvain

lsinc1361

2022

Artificial intelligence

5.00 credits	30.0 h + 30.0 h	Q2

This learning unit is not open to incoming exchange students!

Teacher(s)	Mouthuy Sébastien ;
Language :	French
Place of the course	Charleroi
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	• Research-based problem solving: problem formulation, informed and uninformed research strategies, local research, behavioral assessment and estimated cost, applications • Constraint satisfaction: formulation problems, constraint tracing and propagation, applications • Games and adversarial research: minimax algorithm and Alpha-Beta pruning, applications • Propositional logic: knowledge representation, inference and reasoning, applications • First-order logic: knowledge representation, inference and reasoning, forward and backward chaining, rule-based systems, applications • Planning: planning problem languages, research methods, planning graphs, hierarchical planning, extensions, applications • AI, philosophy and ethics: "can machines act intelligently?", "can machines really think?", ethics and the risks of artificial intelligence, the future of artificial intelligence
Learning outcomes	**At the end of this learning unit, the student is able to :** With regard to the AA reference of the "Master's degree in computer science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: INFO1.1-3 INFO2.2-4 INFO5.2, INFO5.5 INFO6.1, INFO6.4 With regard to the AA reference of the "Master [120] in computer science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: SINF1.M4 SINF2.2-4 SINF5.2, SINF5.5 SINF6.1, SINF6.4 With regard to the AA reference of the "Master [60] in computer science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: 1SINF1.M4 1SINF2.2-4 1SINF5.2, 1SINF5.5 1SINF6.1, 1SINF6.4 Students who successfully complete this course will be able to • explain and make good use of the basic concepts of knowledge representation, problem solving and reasoning methods, as used in artificial intelligence • assess the applicability, strengths, and weaknesses of knowledge representation, problem solving, and reasoning methods in solving real-world engineering problems • develop intelligent systems by assembling solutions to concrete problems • discuss the role of knowledge representation, problem solving and reasoning methods in the design and realization of intelligent systems Students will have developed methodological and operational skills. In particular, they will have developed their ability to: • master a new programming language primarily using an online tutorial • deal with deadlines and competitiveness when developing an application that wants to be the most efficient.

Evaluation methods	• Review: 70% • Assignments: 30%. The work must be personal (team of 2). No collaboration between groups. No copy from internet. Cheating = 0 / 20 for all missions. In case of failure of the missions the weighting of this part will be more important. • The work can only be carried out during the quadrimester of the course. It is not possible to redo the work during another semester or for the September session.
Teaching methods	• problem-based learning • Learning by doing • 5 missions (of two weeks) • teams of two students • Lecture (1 hour / week) • Feedback on closed missions (1 / 2 hour) • Discussion of the current mission (1 / 2 hour)
Content	• Introduction • Research • Informed search • Local search • Search with opponent • Constraint Satisfaction Problem • Logical agent • First-order logic and inference • Classic planning • Planning in the real world • Learn from examples • Philosophical foundations, the present and the future of AI
Inline resources	**https://moodleucl.uclouvain.be/course/view.php?id=8082**
Other infos	Bibliography: • Stuart Russell, Peter Norvig, *Artificial Intelligence : a Modern Approach*, 3nd Edition, 2010, 1132 pages, Prentice Hall • transparents en ligne
Faculty or entity in charge	SINC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5	LSINC1103 AND LSINC1402	🔍