UCLouvain

linfo1361

2023

Artificial intelligence

5.00 credits	30.0 h + 30.0 h	Q2

Teacher(s)	Deville Yves ;Piette Eric (compensates Deville Yves) ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	LEPL1402: Programming in a high-level language
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	• The evaluation will be carried out through an assessment of the assignments done during the year as well as an exam • Continuous assessment consists of assignments that will result in a single overall mark, given at the end of the last assignment. Failure to comply with the methodological guidelines set out on Moodle, particularly with regard to the use of online resources or collaboration between students, for any assignment will result in an overall mark of 0 for the assessment. • Using ChatGPT, or any other equivalent tool, is strictly forbidden for the completion of assignments. In all cases, the teacher reserves the right to ask students to attend an additional oral Q/A session in order to check their understanding of the work submitted. In the event of failure, an overall mark of 0 will be awarded to the assignment. • The method of integrating the assessments of the assignments and the exam is as follows. If the assignments are graded at least 10/20, the weighting of the assignments is 30%; the weighting of the exam is 70%. If the assignments have been evaluated at n/20, with n<10, the weight of these assignments is more important and is calculated according to the following formula: 30% + (10-n)*2.5%. The weighting of the exam is then adjusted accordingly. • The assignments can only be completed during the four-month period of the course. It is not possible to redo the assignments during another semester or for the September session. • The exam will be written, but if the teacher is unsure of the grade to be given to a student, he/she may be questioned in an oral supplement.
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 • Search • Informed search • Local search • Constraint Satisfaction Problem • Adversarial search • Logical agent • First-order logic and inference • Planning • Learn from examples • Philosophical foundations, the present and the future of IIA
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	INFO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Specialization track in Computer Science	FILINFO	5		
Bachelor in Computer Science	SINF1BA	5		
Master [120] in Electro-mechanical Engineering	ELME2M	5		
Master [120] in Data Science Engineering	DATE2M	5		
Minor in Computer Sciences	MINSINF	5		
Master [120] in Data Science: Information Technology	DATI2M	5		
Mineure Polytechnique	MINPOLY	5		