LINGI2261

2013-2014

Artificial intelligence: representation and reasoning

6.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Deville Yves ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	> http://icampus.uclouvain.be/claroline/course/index.php?cid=ingi2261
Prerequisites :	-- Programminng abilities in a high-level language, algorithmics and data structures (e.g. SINF1121) -- Discrete mathematics (e.g. INGI1101)
Main themes :	-- Problem solving by searching : formulating problems, uninformed and informed search search strategies, local search, evaluation of behavior and estimated cost, applications -- Constraint satisfaction : formulating problems as CSP, backtracking and constraint propagation, applications -- Games and adversarial search : minimax algorithm and Alpha-Beta pruning, applications -- Propositional logic : representing knowledge in PL, inference and reasoning, applications -- First-order logic : representing knowledge in FOL, inference and reasoning, forward and backward chaining, rule-based systems, applications -- Planning : languages of planning problems, search methods, planning graphs, hierarchical planning, extensions, applications -- AI, philosophy and ethics : "can machines act intelligently ?", "can machines really think ?", ethics and risks of AI, future of AI
Aims :	Students completing successfully this course will be able to -- explain the basic knowledge representation, problem solving and reasonning methods in artificial intelligence -- assess the applicability, strength, and weaknesses of the basic knowledge representation, problem solving and reasonning in solving particular engineering problems -- develop intelligent systems by assembling solutions to concrete computational problems -- discuss the role of knowledge representation, problem solving and reasonning in intelligent-system engineering Students will have developed skills and operational methodology. In particular, they have developed their ability to: -- master a new programming language using online tutorial -- deal with deadlines and competitivity in developping the most efficient solution. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	-- Exam : 75% -- Assignments : 25%. Assignments must be personnal (team of 2). No collaboration between groups. No copying from Internet. Cheating = 0/20 all assignments. In case of failure of the missions the weight of this part will be more important. -- Assignments may be realized only during the quadrimester of the course. It's not possible to realize the assignments during another quadrimester or for the exam session of september.
Teaching methods :	-- Problem-Based Learning -- Learning by doing -- 5 assignments (one per two weeks) -- Team of two students -- Limited teaching (1 hour / week) -- Feed-back of problems (1/2 hour) -- Discussion of current problem (1/2 hour)
Content :	-- Introduction -- Search

	-- Informed search -- Local search -- Adversarial search -- Constraint Satisfaction Problem -- Logical Agent -- First-order logic and Inference -- Classical Planning -- Planning in the real world -- Learning from examples -- Philosophical foundations & mp; Present and future of AI
Bibliography :	-- Stuart Russell, Peter Norvig, Artificial Intelligence : a Modern Approach, 3nd Edition, 2010, 1132 pages, Prentice Hall -- slides online
Other infos :	
Cycle and year of study :	> Master [120] in Computer Science and Engineering > Master [120] in Computer Science > Master [60] in Computer Science > Master [120] in Biomedical Engineering
Faculty or entity in charge:	INFO