LINGI2365

2012-2013

Constraint programming

5.0 credits	30.0 h + 15.0 h	2q

Teacher(s) :	Deville Yves ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Prerequisites :	Basic concepts and methods in Artificial Intelligence (e.g. INGI2261) Students who did not follow this course should ask permission to the instructor to follow the class.
Main themes :	-- Constraints and domains -- Constraint Satisfaction Problems (CSP) -- Models and languages for constraint programming -- Methods and techniques for constraint solving (consistency, relaxation, optimization, search, linear programming, global constraints, ...) -- Search techniques and strategies -- Problem modelling and resolution -- Applications to different problem classes (e.g. planification, scheduling, ressource allocation, economics, robotics)
Aims :	Students completing successfully this course will be able to -- explain and apply techniques for solving Constraint Satisfaction Problems -- solve simple problems involving CSP -- explain foundations of models and languages for constraint solving -- identify problem classes where constraint programming can be apply successfully -- model simple problems in the form of constraints, and express these models in a constraint programming language, including search strategies. Students will have developed skills and operational methodology. In particular, they have developed their ability to: -- master rapidly a new programming language; -- use technical documents to deepen their knowledge of a topic. *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 :	-- Projects (15% of the final grade) -- Problem sets (25% of the final grade) -- Written examn (60% of the final grade)
Teaching methods :	-- lectures -- practicals : 4 problem sets and 1 bigger project performed by group of 2
Content :	-- Introduction to constraint programming -- COMET: a constraint programming language -- Propagation -- Searching -- Modeling -- Designing constraints -- Global constraints -- Constraint programming and Mixed Integer programming -- Scheduling -- Continuous domain
Bibliography :	slides online References -- K. Apt. Principles of Constraint Programming. Cambridge University Press, 2003 -- Rina Dechter. Constraint Processing. Morgan Kaufmann, 2004 -- F. Rossi, P. Van Beek, T. Walsh (eds). Handbook of Constraint Programming. Elsevier 2006. -- Kim Marriott, Peter J. Stuckey. Programming with Constraints. An Introduction.MIT Press, 1998. -- P. Van Hentenryck. The OPL Optimization Programming Language. The MIT Press, 1999.
Cycle and year of study :	> Master [120] in Computer Science and Engineering > Master [120] in Computer Science

Faculty or entity in charge:	INFO