UCLouvain

linfo2365

2021

Constraint programming

5.00 credits	30.0 h + 15.0 h	Q2

Teacher(s)	Schaus Pierre ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	• Constraints and domains • Practical aspects of c onstraint solvers • 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 differents problem classes (e.g. planification, scheduling, ressource allocation, economics, robotics)
Learning outcomes	**At the end of this learning unit, the student is able to :** Given the learning outcomes of the "Master in Computer Science and Engineering" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • INFO1.1-3 • INFO2.2-4 • INFO5.4-5 • INFO6.1, INFO6.4 Given the learning outcomes 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 • SINF5.4-5 • SINF6.1, SINF6.4 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.
Evaluation methods	• Projects (50% of final grade) • Written exam (50% of final grade) Project and problem sets are mandatory during the semester of the course and cannot be repeated for the second examination session.
Teaching methods	Lectures and practice sessions
Content	• Constraint Programming : a Declarative Programming paradigm • Architecture of a constraint programming solver • Global contraints and implementation techniques (incrementality, etc) • Search techniques and strategies • Combinatorial optimization problem modeling and solving

	• Applications to different problem classes (e.g. planification, scheduling, resource allocation, economics, robotics)
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=9158 www.minicp.org
Bibliography	Le site www.minicp.org + lectures suggérées pendant le semestre
Other infos	A good background in data-structure and algorithms is required to follow this course and a good knowledge of Java language
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Data Science Engineering	DATE2M	5		
Master [120] in Computer Science and Engineering	INFO2M	5		
Master [120] in Data Science: Information Technology	DATI2M	5		
Master [120] in Computer Science	SINF2M	5		