UCLouvain

lingi2365

2020

Constraint programming

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

5 credits	30.0 h + 15.0 h	Q2

Teacher(s)	Deville Yves ;Schaus Pierre ;Schaus Pierre (compensates Deville Yves) ;
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)
Aims	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 1 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	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** • 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	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** 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	Background • LINGI2261 : Artificial Intelligence
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)

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