




5.00 credits

30.0 h + 15.0 h

Q2

Teacher(s)	Schaus Pierre ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	<ul style="list-style-type: none"> • Constraints and domains • Practical aspects of constraint 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 different problem classes (e.g. planification, scheduling, resource allocation, economics, robotics)
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>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:</p> <ul style="list-style-type: none"> • INFO1.1-3 • INFO2.2-4 • INFO5.4-5 • INFO6.1, INFO6.4 <p>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:</p> <ul style="list-style-type: none"> • SINF1.M4 • SINF2.2-4 • SINF5.4-5 • SINF6.1, SINF6.4 <p>1</p> <p>Students completing successfully this course will be able to</p> <ul style="list-style-type: none"> • 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 applied successfully • model simple problems in the form of constraints, and express these models in a constraint programming language, including search strategies. <p>Students will have developed skills and operational methodology. In particular, they have developed their ability to:</p> <ul style="list-style-type: none"> • master rapidly a new programming language; • use technical documents to deepen their knowledge of a topic.
Evaluation methods	<p>For the first session, the global grade for the course is solely based on the grades of the computing projects, submitted and evaluated during the semester.</p> <p>The projects are not evaluated again for the second session and may not be resubmitted.</p> <p>The grades for projects are kept as such representing 50% and the other 50% are evaluated with a written exam, or when appropriate, on a computer.</p> <p>Projects are individual. It means that any source code of a project estimated to be</p> <ul style="list-style-type: none"> - copied or inspired by the one of another student, or - copied or inspired by a source code found on the internet or another source, <p>will result in a zero grade for the student at the projects and the exam</p> <p>The same consequences will hold for a student that voluntarily shares his code or make available to other students.</p>

Teaching methods	Students will follow a MOOC on the EdX platform (videos) and there will be programming exercises and quizzes graded on ingenious.
Content	<ul style="list-style-type: none"> • Constraint Programming : a Declarative Programming paradigm • Architecture of a constraint programming solver • Global constraints 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 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		