LINGI2266
2015-2016

Advanced Algorithms for Optimization

5.0 credits	30.0 h + 15.0 h	1q

Teacher(s) :	Schaus Pierre ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Main themes :	-- tree research exploration -- branch and bound -- relaxation (Lagrangian) and calculation of terminals -- local search -- mathematical programming -- constraint programming -- graph algorithms -- wide neighborhood research -- dynamic programming -- greedy algorithms and approximation algorithms -- multi-criteria optimization -- optimization without derivative -- comparisons of algorithms These methods will be applied to real problems like vehicle routing, scheduling and rostering confection, network design, scheduling and scheduling, etc..
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 -- INFO2.3-5 -- INFO5.3-5 -- 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 -- SINF2.3-5 -- SINF5.3-5 -- SINF6.1, SINF6.4 Students completing this course successfully will be able to -- explain the algorithms for solving discrete optimization problems by describing precisely specifying the problems they solve, indicating their advantages, disadvantages and limitations (computing time, accuracy, problems of scaling , etc.), -- identify the algorithms that apply to a discrete optimization problem they are facing and make an arguedchoice among them , -- implement algorithms for solving discrete optimization problems.

	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 :	Much of the evaluation is associated to pratical work (30% of points across three assignments). The remaining 70% will be assessed in a conventional manner with a written or oral examination. Projects can not be redone in the second session.
Teaching methods :	The presentation of the algorithms in the lecture will be accompanied by practical work (assignments / micro-projects) requesting the implementation of an algorithm to solve a practical optimization problem. The evaluation work will be partially automated on the basis of the quality of the solutions found by the algorithms.
Other infos :	Background: -- LSINF1121
Faculty or entity in charge:	INFO

Programmes / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Computer Science and Engineering	INFO2M	5	-	🔍
Master [120] in Computer Science	SINF2M	5	-	🔍