UCLouvain

llsms2031

2019

Tools for Supply Chain Management Decisions

Au vu du contexte sanitaire lié à la propagation du coronavirus, les modalités d'organisation et d'évaluation des unités d'enseignement ont pu, dans différentes situations, être adaptées ; ces éventuelles nouvelles modalités ont été -ou seront- communiquées par les enseignant·es aux étudiant·es.

5 crédits	30.0 h	Q1

Enseignants	Van Vyve Mathieu ;
Langue d'enseignement	Anglais
Lieu du cours	Louvain-la-Neuve
Préalables	This course is reserved for students with a bachelor's degree in business engineering or students with equivalent quantitative method skills.
Thèmes abordés	This course is aimed at providing an understanding of the structures behind supply chain optimization problems as well as an understanding of the methodological aspects of the corresponding solution techniques.
Acquis d'apprentissage	**During their programme, students of the LSM Master's in management and Master's in Business engineering will have developed the following capabilities'** **KNOWLEDGE AND REASONING** • Master highly specific knowledge in one or two areas of management : advanced and current research-based knowledge and methods. 1 **A SCIENTIFIC AND SYSTEMATIC APPROACH** • Conduct a clear, structured, analytical reasoning by applying, and eventually adapting, scientifically based conceptual frameworks and models,to define and analyze a problem. • Consider problems using a systemic and holistic approach : recognize the different aspects of the situation and their interactions in a dynamic process. - - - - *La contribution de cette UE au développement et à la maîtrise des compétences et acquis du (des) programme(s) est accessible à la fin de cette fiche, dans la partie « Programmes/formations proposant cette unité d'enseignement (UE) ».*
Modes d'évaluation des acquis des étudiants	**En raison de la crise du COVID-19, les informations de cette rubrique sont particulièrement susceptibles d'être modifiées.** **1. Continuous assessment** • Date and type of assessment (work, test, other): ... Work to be handed in for Nov 30, 2017 • Date and type of evaluation: Presentation 21-22 Dec 2017 **2. Review during Evaluation Week** • Q1: Monday 6 Nov. to Fri. 10 Nov. 17; • Q2: from Monday 19 March to Fri. 23 March 17 **3. Examination in session of examinations:** • January: Jan. 5-26, 2018 • June: 4 to 29 June 2018 Oral: No Written: yes Number of hours: 3h.
Contenu	The course starts with an in depth revision of the revised simplex algorithm, because it provides the computational and modeling paradigm allowing one to model and solve (sometimes using so-called decomposition methods) large scale models involving many variables. In particular, the column generation approach, which is frequently used in solving large scale problems by decomposition, is illustrated on the cutting stock problem, a classical production planning problem. Production planning are approached from a practical computational perspective. Formulated as MIP problem, they can be very difficult to solve and thereby require to maintain a certain level of aggregation. Branch and bound improvement techniques such as constraint (Branch and cut) and column (Branch and price) generation are considered. Content STRUCTURAL ASPECTS AND METHODS. Convexity. Minkowski polyhedral representation. Duality. From linear programming to convex programming. The revised

	simplex algorithm as a computational paradigm. Complexity of algorithms. Mixed integer programming. CUTTING STOCK AND BIN PACKING PROBLEMS. Coping with the combinatorial explosion of patterns. Column generation techniques and the related knapsack problem. Extensions of the cutting stock problem. . DECOMPOSITION APPROACHES AND DECENTRALIZATION. Handling the multidivisional model by a decomposition approach : solving repeatedly a series of divisional problems and a coordination one (the decomposition approach). Getting insight from decomposition for decentralization purposes. SUPPLY CHAIN PLANNING. LP and MIP formulations for production planning and scheduling problems. Approximate solutions of MIP problems. Improvement of the Branch and Bound approach by cutting plane and column generation. Methods : In-class activities 1Lectures 1 Exercices/PT 1 Problem based learning At home activities : 1 Readings to prepare the lecture 1 Exercices to prepare the
Autres infos	Pré-requis (idéalement en termes de compétences) : Introduction à la gestion des opérations, à la gestion de la production, ainsi qu'à la recherche opérationnelle. Connaissance élémentaire de la programmation linéaire (algorithme du simplexe et dualité) et de la programmation linéaire mixte entière (algorithme de branchement et séparation). Introduction générale à l'algorithmique et à la programmation informatique. Cours d'algèbre linéaire de premier niveau. Evaluation : Exercices réalisés par groupes de deux ou trois, examen final oral avec préparation écrite. Support : Transparents fournis via icampus et documents transmis au cours. Références : Fournies durant le cours. Interventions d'entreprises : 1 étude de cas Compétences transversales : 1 rédaction écrite 1 travail de groupe 1 résolution de problème 1 prise de décision 1 esprit critique Techniques : 1 outils informatiques 1 modélisation 1 méthodes quantitatives 1 mathématiques
Faculté ou entité en charge:	CLSM

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Crédits	Prérequis	Acquis d'apprentissage
Master [120] : ingénieur de gestion	INGM2M	5		
Master [120] : ingénieur de gestion	INGE2M	5		