Logistics and Transport

Design, Assess, Optimize using Operations Research

Van-Dat.Cung@grenoble-inp.fr
(Computer Science, OR, Logistics and Transport)

6 ECTS

Van-Dat CUNG

Prof. Grenoble-INP Génie Industriel, laboratory G-SCOP
Co-Head M2 ORCO / Head of CLIF
Vice Président-Pôle d'intelligence Logistique, F&R

Research domains

- Logistics & Transport, Contenance Management
- Physical & Information flows optimization in a Supply Chain
- Solving large size Combinatorial Optimization problems
- Exact/Approximate algorithm, sequential/parallel algorithms

Teaching domains

- Logistics: quantitative methods in Transport
- Algorithms, programming langages
- Operations Research, Combinatorial Optimization

Common Course for Several Curriculums

GI 5A ICL / Master 2 GI / DD

Master 2 ORCO / DD

Erasmus / Exchanges

« Applied Research » oriented

Documents and Assessments

For « GI » students, all the documents (slides, articles, schedule) can be found on CHAMILO

« GI 5A Master-ICL Logistique de transport et recherche opérationnelle »

For M2 ORCO students, you will receive specific links on filesender of Renater

Mark =

50% Examen (2h, *individual*)

50% Projects (problem presentation within its application context, state of the art, solving methods, results analysis, conclusions & perspectives, *to be done in groups of 4-5 students*)

Course Contents

Logistics and Transport planning under Operations Research Approach

- Strategic planning: Plants and hubs location (facility location problems)
- Tactical planning: Service network design with consolidation (network design/flows problems)
- Operational planning: Vehicle routing and last mile deliveries (routing problems)

OR methods

- Modelling using (M)ILP
- Solving methods:
  - Upper bounds and feasible solutions:
    - *With guarantee performance : approximation heuristics*
    - Without guarantee performance: (meta)heuristics
    - Exact solving (B&X methods)
  - Lower bounds and infeasible solutions:
    - Lagrangean Relaxation

Skills in

OR

- L0: Know nothing
- L1: Heard about LP or MathProg
- L2: Know how to write a MathProg
- L3: Know how to use a MathProg solver (CPLEX/LPSolve/Gurobi/etc.)
- L4: Have programmed with a MathProg solver to optimze a problem
- L5: Master advanced MathProg/Heuristics techniques (Relaxations, Column generation, Meta/Matheuristics, etc.)

Algorithms

- L0: Know nothing
- L1: Flowchart / Diagram
- L2: Write an algo with inputs/outputs
- L3: Write an aglo with several levels of details
- L4: From algo to computing program with a programming language (Java, C/C++, Python, VBA): <1000 lines
- L5: L4 with > 1000 lines

An award-wining project !

Previewed Schedule

LT-OR **2021-2022**

		13h30-15h	15h-16h30	16h30-18h
29/09/2021		Lecture	Lecture	
06/10/2021		Lecture	Lecture	
13/10/2021		Lecture	Lecture	
20/10/2021		Lecture	Lecture	Projects
27/10/2021		Lecture	Lecture	Projects
03/11/2021	Toussaint			
10/11/2021		Lecture	Lecture	Projects
17/11/2021		Lecture	Lecture	Projects
24/11/2021		Lecture	Lecture/Summary	Projects
01/12/2021		Projects	Projects	Projects
08/12/2021		Projects	Projects	Projects
15/12/2021		**Examination (2h 13h30-15h30)**		Projects (15h30-18h)
22/12/2021	Christmas			
29/12/2021	New Year			
03/01/2022	Midnight	Project reports (preliminary version: : pb description, modelling and previewed solving methods)		
05/01/2022		Project presentations		
12/01/2022		Project presentations		
19/01/2022	Midnight	**Upload projects on Filsender or Chamilo or by USB Keys**		

Some books here

http://genie-industriel.grenoble-inp.fr/cursus-ingenieur/ue-logistique-de-transport-et-recherche-op-eacute-rationnelle-wgulogi9-771670.kjsp?RH=GENIE_FOR-etud