

5 credits

30.0 h + 15.0 h

Q2

Teacher(s)	Catanzaro Daniele ;
Language :	English
Place of the course	Mons
Main themes	This course provides an introduction to mathematical modeling of computational problems. It covers the common algorithms, algorithmic paradigms, and data structures used to solve these problems. The course emphasizes the relationship between algorithms and programming. It pays particular attention on the practical importance of specific classes of optimization problems in management science and motivate the students to develop algorithms to solve them.
Aims	<p>This course contributes to develop the following competencies.</p> <ul style="list-style-type: none"> • Knowledge • Scientific reasoning and systematic approach • Project management • Leadership <p>1</p> <p>At the end of this course, students will:</p> <ul style="list-style-type: none"> • Improve their strategical thinking skills • Acquire fundamental knowledge on the modeling and the resolution of practical problems • Apply the appropriate techniques to propose a useful solution. <p>-----</p> <p><i>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".</i></p>
Evaluation methods	Individual project with final report and oral exam.
Teaching methods	Blackboard lectures.
Content	<ol style="list-style-type: none"> 1. Recall of fundation of data structures 2. Iterations vs Recursion 3. Dynamic Programming Part I - Well Solved Optimization Problems in Management Science: Spanning Trees 4. Dynamic Programming Part II - Well Solved Optimization Problems in Management Science: Shortest Paths 5. Dynamic Programming Part III - Well Solved Optimization Problems in Management Science: Network Flows 6. Dynamic Programming Part VI - Well Solved Optimization Problems in Management Science: Matching 7. Hard Optimization Problems in Management Science - Finding the optimum via Branch-&-Bound 8. Hard Optimization Problems in Management Science - Heuristics 9. Hard Optimization Problems in Management Science - Local Searches 10. Hard Optimization Problems in Management Science - Metaheuristics
Faculty or entity in charge	CLSM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Business Engineering	INGM1BA	5		