






In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

5 credits

30.0 h + 30.0 h

Q2

Teacher(s)	Pecheur Charles ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	<ul style="list-style-type: none"> • Methods to design and prove programs • Program transformations and techniques used to improve the efficiency • Program schemes and problem classes
Aims	<p>Given the learning outcomes of the "Bachelor in Engineering" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes:</p> <ul style="list-style-type: none"> • AA1.1, AA1.2 • AA2.4, AA2.7 <p>Given the learning outcomes of the "Bachelor 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"> • S1.I5 • S2.2-3 <p>1 Students completing successfully this course will be able to</p> <ul style="list-style-type: none"> • imagine a correct and efficient algorithm to solve a given problem • create and specify the design for a software product using an accepted program design methodology and appropriate design notation • demonstrate the exactness of complex algorithms <p>Students will have developed skills and operational methodology. In particular, they have developed their ability to</p> <ul style="list-style-type: none"> • use a rigorous approach to ensure the correctness of the result, using mathematical tools <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	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <p>In June, the final mark will consist of continuous assessment (25%) and the examination (75%). In September, the final mark will be based only of the examination (100%).</p>
Teaching methods	<p>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</p> <ul style="list-style-type: none"> • Lectures every week • Practical exercises in which students apply in simple situations the concepts described in the lectures • Project to practice techniques in the case of a larger application
Content	<ul style="list-style-type: none"> • Methods to design and prove programs : invariant methods, wp calculus, induction on structures. • Program transformations and techniques used to improve the efficiency • Program schemes and problem classes: global research schemes (backward path, selection and evaluation, binary research), local research schemes (voracious strategy; gradient research, simulated annealing), structural reduction schemes (split to reign, dynamic programming, relaxation, constraints).
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=9241
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Chemistry and Bioindustries	BIRC2M	5		
Master [60] in Computer Science	SINF2M1	5		
Master [120] in Agricultural Bioengineering	BIRA2M	5		
Master [120] in Environmental Bioengineering	BIRE2M	5		
Master [120] in Computer Science	SINF2M	5		
Master [120] in Forests and Natural Areas Engineering	BIRF2M	5		