






5 credits

30.0 h + 30.0 h

Q2

Teacher(s)	Pecheur Charles ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	Within SINF1BA : LSINF1225 Within FSA1BA : LFSAB1101, LFSAB1102, LFSAB120&, LFSAB1202, FSAB1301, LFSAB1401 <i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	<ul style="list-style-type: none"> <li>• Methods to design and prove programs</li> <li>• Program transformations and techniques used to improve the efficiency</li> <li>• Program schemes and problem classes</li> </ul>
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"> <li>• AA1.1, AA1.2</li> <li>• AA2.4, AA2.7</li> </ul> <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"> <li>• S1.I5</li> <li>• S2.2-3</li> </ul> <p>1 Students completing successfully this course will be able to</p> <ul style="list-style-type: none"> <li>• imagine a correct and efficient algorithm to solve a given problem</li> <li>• create and specify the design for a software product using an accepted program design methodology and appropriate design notation</li> <li>• demonstrate the exactness of complex algorithms</li> </ul> <p>Students will have developed skills and operational methodology. In particular, they have developed their ability to</p> <ul style="list-style-type: none"> <li>• use a rigorous approach to ensure the correctness of the result, using mathematical tools</li> </ul> <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	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%).
Teaching methods	<ul style="list-style-type: none"> <li>• Lectures every week</li> <li>• Practical exercises in which students apply in simple situations the concepts described in the lectures</li> <li>• Project to practice techniques in the case of a larger application</li> </ul>
Content	<ul style="list-style-type: none"> <li>• Methods to design and prove programs : invariant methods, wp calculus, induction on structures.</li> <li>• Program transformations and techniques used to improve the efficiency</li> <li>• 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).</li> </ul>
Inline resources	<a href="http://icampus.uclouvain.be/claroline/course/index.php?cid=INGI2122">http://icampus.uclouvain.be/claroline/course/index.php?cid=INGI2122</a>
Bibliography	<ul style="list-style-type: none"> <li>• syllabus en ligne</li> <li>• énoncés d'exercices en ligne</li> </ul>

Other infos	Background : <ul style="list-style-type: none"><li>• SINF1225 experience in small-software programming</li><li>• SINF1121 algorithms and data structures</li><li>• INGI1101 logical reasoning and reasoning by induction</li></ul>
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Forests and Natural Areas Engineering	<a href="#">BIRF2M</a>	5		
Master [120] in Agricultural Bioengineering	<a href="#">BIRA2M</a>	5		
Master [120] in Chemistry and Bioindustries	<a href="#">BIRC2M</a>	5		
Bachelor in Computer Science	<a href="#">SINF1BA</a>	5	<a href="#">LSINF1225</a> AND <a href="#">LSINF1101</a> AND <a href="#">LSINF1102</a> AND <a href="#">LSINF1103</a>	
Master [120] in Environmental Bioengineering	<a href="#">BIRE2M</a>	5		
Minor in Computer Sciences	<a href="#">LINFO100I</a>	5	<a href="#">LSINF1225</a>	