

5.00 credits

30.0 h + 30.0 h

Q2


**This learning unit is not open to incoming exchange students!**

Language :	French
Place of the course	Charleroi
Prerequisites	LSINC1101
Main themes	The course introduces the student to the main methods for building algorithms based on a specification answering an identified problem. Recursion is used as a basis and the evaluation of the efficiency is based on the calculation of the execution time (complexity theory). We use recursive data structures: lists, binary trees, red-black trees, etc. We also use systematic methods for building efficient programs: divide and conquer, memoization, dynamic programming, greedy methods, and generate/test.
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>At the end of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>- formalize a recursive solution from a given problem statement;</li> <li>- calculate the theoretical complexity of a simple algorithm (recursive or not);</li> <li>- define and use a recursive data structure;</li> <li>- solve a problem in a systematic way and propose a correct and efficient algorithm.</li> </ul>
Evaluation methods	Written exam.
Teaching methods	Lectures with many examples, plus practical work. Students are also invited to do exercises at home.
Content	<p>The course covers the following topics:</p> <ul style="list-style-type: none"> <li>- Specification using pre- and post-conditions</li> <li>- Execution time evaluation</li> <li>- Recursion</li> <li>- Recursive data structures: lists, binary trees, red-black trees</li> <li>- Program construction methods: divide and conquer, memoization, dynamic programming, greedy method, generate/test</li> </ul>
Other infos	The course follows part of the book: Hetland, Magnus Lie. Python Algorithms: mastering basic algorithms in the Python Language. Apress, 2014.
Faculty or entity in charge	SINC

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	<a href="#">SINC1BA</a>	5		