lsinc1103

2022

Introduction to Algorithmics

UCLouvain

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	**At the end of this learning unit, the student is able to :** At the end of this course, the student will be able to: - formalize a recursive solution from a given problem statement; - calculate the theoretical complexity of a simple algorithm (recursive or not); - define and use a recursive data structure; - solve a problem in a systematic way and propose a correct and efficient algorithm.
Evaluation methods	Written exam.
Teaching methods	Lectures with many examples, plus practical work. Students are also invited to do exercises at home.
Content	The course covers the following topics: - Specification using pre- and post-conditions - Execution time evaluation - Recursion - Recursive data structures: lists, binary trees, red-black trees - Program construction methods: divide and conquer, memoization, dynamic programming, greedy method, generate/test
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

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5		🔍