LFSAB1402

2012-2013

Informatics 2

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Van Roy Peter ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	FSAB1401: Informatics 1 or equivalent
Main themes :	The principal themes covered by this course are: -- Techniques for deriving the computational complexity of an algorithm -- Techniques for reasoning about programs -- Object-oriented modeling -- Linear and tree-like data structures -- Recursive algorithms -- Implementation in Java of medium-sized programs -- Methods for testing and validating programs
Aims :	At the conclusion of this course, the students will be able to: -- make a choice between several data representations and algorithms to process them, -- reason on program fragments: algorithmic complexity and efficiency of the programs that implement them, reasoning with recursion, -- apply the principles of object-oriented modeling, -- design and apply methods for program testing. *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".*
Evaluation methods :	The evaluation has 2 components: an intermediary evaluation during the quadrimester and a final exam at the end of the quadrimester (written exam). The final mark is a combination of the scores in these two evaluations
Teaching methods :	Active learning will be encouraged. The precise form that the active participation of the student will take is up to the teacher, following the pedagogical guidelines of the Faculty.
Content :	-- Data abstraction -- Linear data abstractions (stacks, queues, lists, etc.) and their applications -- Techniques for representing linear data abstractions -- Object-oriented modeling (inheritance, composition, and reuse) -- Preconditions, postconditions, invariants -- Reasoning techniques (deduction rules, termination proofs, ...) -- Basics of computational complexity -- Derivation of the temporal complexity of an algorithm -- Derivation of the spatial complexity of a data structure -- Recursive formulation of a solution and recursive algorithms -- Tree-like data abstractions (binary trees) and their applications -- Techniques for representing tree-like data abstractions -- Quantified measurements of program efficiency -- Design and implementation of methods for testing and validating programs
Bibliography :	Workfiles for each of the parts (available on the website and in printed version) Peter Van Roy et Seif Haridi, PROGRAMMATION: Concepts, techniques et modèles, Dunod, 2007 Peter Van Roy et Seif Haridi, Concepts, Techniques, and Models of Computer Programming, MIT press, 2004
Cycle and year of study :	> Bachelor in Computer Science > Bachelor in Engineering : Architecture > Bachelor in Economics and Management > Bachelor in Mathematics > Bachelor in Engineering
Faculty or entity in charge:	BTCI