

5 credits


30.0 h + 30.0 h

Q1



This learning unit is not being organized during this academic year.

Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	<p>This course assumes that the student already masters basic programming skills targeted by courses LINFO1101 or LEPL1401 and concepts on algorithmics and simple data structures covered by course LEPL1402.</p> <p><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></p>
Main themes	<ul style="list-style-type: none"> • Programming paradigms: functional programming, object-oriented programming and declarative dataflow programming; • Formal semantics and reasoning techniques on programs; • Core language and abstract machine; • Data Abstractions and Object-Oriented Modeling; • Recursive algorithms and programming with invariant using linear and tree data structures; • Analysis of the temporal complexity of an algorithm and the spatial complexity of a data structure; • Non-determinism, scheduling and equity; • Implementation of medium complexity programs with a focus on test and program validation methods.
Aims	<p>Regarding the learning outcomes of the program of Bachelor in Engineering, this course contributes to the development and the acquisition of the following learning outcomes:</p> <ul style="list-style-type: none"> • LO 1.1, 1.2 • LO 2.3, 2.4, 2.5, 2.6, 2.7 • LO 4.2, 4.3, 4.4 <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.I2., S1.I3, S1.I5 • S2.2., S2.3, S2.4 • S5.3, S5.4., S5.5. <p>1</p> <p>Students completing successfully this course will be able to</p> <ul style="list-style-type: none"> • specify the problems, divide them into their basic steps, and design algorithms and abstractions to solve them; • choose the right programming paradigm and write a program in this paradigm to solve a problem; • use formal semantics to explain the accuracy of the program; • write small concurrent programs in the deterministic dataflow paradigm. • think using abstractions (reason correctly on a system that includes several layers of abstractions, and define new abstractions to simplify the resolution of a problem) <p>----</p> <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>
Bibliography	<p>Peter Van Roy et Seif Haridi, PROGRAMMATION: Concepts, techniques et modèles, Dunod, 2007</p> <p>Peter Van Roy et Seif Haridi, Concepts, Techniques, and Models of Computer Programming, MIT Press, 2004</p>
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Computer Science	SINF1BA	5	LINFO1101	
Bachelor in Engineering	FSA1BA	5		