Fundamentals in Computer Science

ECTS
7 crédits

Hourly volume
72h

Introducing

Objectives

This course is heterogeneous course and groups 3 parts :
- Functionnal Programming ¿ Caml (¿FP- Caml¿)
- Formal Logic and Logic Programming in Prolog (¿FL- Prolog¿)
- Advanced Algorithmics (« AA »)

At the end of this module, students are expected to :

[FP-Caml]
- understand and write pure functional programs,
- design recursive functions to iterate over recursive data types,
- define variants or parameterized types,
- more generally think in terms of higher-order functions in order to write reusable codes.
- describe the semantics of simple lambda terms
- have a basic theoretical understanding of the type systems theory

[FL-Prolog part]
- translate natural language statements into formulas of propositional logic and of 1st order predicate calculus
- apply several methods in order to check the validity and the consistency of a formula
- explain the fundamentals of logic programming and of Prolog.
- express problem solving as a demonstration (proof) based on axioms and theorems describing the particular properties of the problem.
- design a Prolog program and trace its execution

[AA Part]
Some paradigms in algorithmics for discrete optimization :
- Exhaustive enumeration
- Divide and Conquer
- Dynamic Programming
- Greedy Algorithms

Practical info

Location(s)

Toulouse