

Computability and complexity

Lecturer

Jean-François RASKIN (Coordinator)

Course mnemonic

INFO-F408

ECTS credits

5 credits

Language(s) of instruction

English

Course period

First term

Campus

Plaine

References, bibliography and recommended reading

Introduction to the theory of computation, Michael Sipser, MIT press.

P. Wolper, Introduction à la Calculabilité, Dunod, 978-2-10-049981-6

Other information

Place(s) of teaching

Plaine

Contact(s)

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Course content

- > Notion of problem and its relation with the notion of language
 - Notion of algorithm and its formalization into Turing machines
 - Recursive functions
 - The class of recursively enumerable languages
 - The class of recursive languages
 - The notion of reduction between problems
 - The class P
 - The class NP
 - Other complexity classes

Objectives (and/or specific learning outcomes)

The aim of the course is to get the students familiar with some basic notions of theoretical computer science, namely computability and complexity theories.

At the end of the course, the students should be able to rigorously define those notions (as well as all the mathematical tools that are necessary to achieve this, such as Turing machines, or the notion of reduction...), to illustrate those notions thanks to actual examples, to explain their scope, and to explain their practical application. For instance, students will be expected to comment and explain a complexity proof that has not been studied at the course. However, they will not be asked to produce new proofs.

Teaching method and learning activities

Ex cathedra lectures, with some exercises given during the lectures.

Evaluation method(s)

Other and Oral examination

Evaluation method(s) (additional information)

Oral exam, with written preparation.

Determination of the mark (including the weighting of partial marks)

100% oral exam.

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the faculty of Sciences

MA-INFO | Master in Computer science | finalité Professional/unit 1