


 Faculty of Applied Sciences

INGI1123 computability and complexity

[30h+30h exercises] 4 credits

This course is not taught in 2005-2006

This course is taught in the 2nd semester

Language: French

Level: First cycle

Aims

- To understand, recognize and identify the limits of computing science
- To understand the foundations, the similarities and differences of the main computability models
- To identify, recognize and understand non computable and untractable problems

Main themes

- Computability : problems and algorithms, computable and non computable functions, reductions, undecidable classes of problems (Rice), fix point theorem, Church-Turing thesis
- Main computability models : Turing machines, recursive functions, lambda calculus, automates
- Complexity theory : complexity classes, NP-completeness, Cook's theorem, how to solve NP-complete problems

Content and teaching methods

see "Main themes"

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

- Prerequisites

This course presupposes the knowledge of material covered in the following course

(1) LINF2121 : Algorithmique et structures de données

- References

(1) Sipser M. Introduction to the Theory of Computation. PWS Publishing Company, 1997

(2) P. Wolper. Introduction à la calculabilité. (2nd edition) InterEditions, 2001.

For more information:

<http://www.ucl.ac.be/etudes/cours/ingi2123.htm>