


 Faculty of Applied Sciences

INGI1123 computability and complexity

[30h+30h exercises] 4 credits

This course is taught in the 2nd semester

Teacher(s): Yves Deville
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>**Other credits in programs**

FSA13BA	Troisième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(4 credits)	
MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(4 credits)	
MATH22/G	Deuxième licence en sciences mathématiques	(4 credits)	Mandatory
SINF13BA	Troisième année d'études de bachelier en sciences informatiques	(4 credits)	
SINF1PM	Année d'études préparatoires au master en sciences informatiques (60 et 120)	(4 credits)	