Data structures and algorithms

Lecturer
Jean CARDINAL (Coordinator)

Course mnemonic
INFO-F413

ECTS credits
5 credits

Language(s) of instruction
English

Course period
First term

Campus
Plaine

Course content

The course focuses on **Randomized Algorithms**:

> Las Vegas and Monte-Carlo algorithms, examples : Minimum cut, binary space partitions

> Randomized complexity classes

> Game-theoretic techniques and Yao's Min-max principle

> Moments and deviations : Randomized selection, coupon collector

> Chernoff bounds

> Randomized data structures and hashing

Objectives (and/or specific learning outcomes)

An understanding of the theoretical foundations of randomness and probabilities in the design of efficient algorithms, and a hands-on experience on the programming of randomized algorithms.

Pre-requisits and co-requisits

Required knowledge and skills

A good background in elementary probability theory and algorithm design.

Teaching method and learning activities

Lectures, exercises, and individual programming assignments.

References, bibliography and recommended reading

Randomized Algorithms, R. Motwani and P. Raghavan, Cambridge University Press, 1995.

Course notes

Université virtuelle

Other information

Place(s) of teaching

Plaine

Contact(s)

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Evaluation method(s)

Project and written examination

Main language(s) of evaluation

English

Programmes

Programmes proposing this course at the faculty of Sciences

MA-BINF | Master in Bio-informatics and Modelling | finalité Research/unit 2 and MA-INFO | Master in Computer science | finalité Professional/unit 1 and finalité Professional/unit 2

Programmes proposing this course at the Brussels School of Engineering

MA-IRIF | Master of science in Computer Science and Engineering | finalité Professional/unit 2