GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2021-2022

Data Structures and Algorithms (E736030)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h** **Contact hrs** 60.0 h

Course offerings and teaching methods in academic year 2021-2022

A (semester 1)	Dutch	Gent	seminar: coached exercises	24.0 h
			lecture	36.0 h

Lecturers in academic year 2021-2022

Veelaert, Peter	TW07	lecturer-in-charge

Offered in the following programmes in 2021-2022	**crdts**	**offering**
Master of Science in Electronics and ICT Engineering Technology (main subject ICT)	6	A

Teaching languages

Dutch

Keywords

Algorithms, data structures

Position of the course

This course covers the most important data structures and algorithms used in computer programs. In addition, there is a more in-depth look at algorithms that are important for electronics-ICT, such as FFT, SVD and dynamic programming. Attention is also paid to practical aspects such as memory usage and numerical precision.

Contents

- Algorithms and complexity: Turing machines, NP-complete problems
- Algorithmic strategies: divide and conquer, recursion, greedy algorithms
- Data structures and abstract data types: lists, heaps, queues, sets, trees
- Hash tables and binary search trees
- Sorting
- Graph algorithms
- Matching and search algorithms
- Dynamic programming
- Numerical methods: Newton, Cordic, FFT, SVD and QR-decomposition

Initial competences

Basic knowledge of Python and C++

Final competences

1 to be able to select an appropriate data structure for a given problem, to implement it and apply it
2 to be able to implement and analyse standard algorithms
3 to be able to apply algorithmic principles in a your own design

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Lecture, seminar: coached exercises

Learning materials and price

Lecture notes and lab assignments available on the electronic learning environmen

References

Course content-related study coaching

The lecturer is during and after the lectures available for explanation. There is guidanceduring the exercises. Individual explanations are possible by appointment.

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Oral examination

Examination methods in case of periodic evaluation during the second examination period

Oral examination

Examination methods in case of permanent evaluation

Written examination with open questions, open book examination

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

For the theoretical part there is an oral examination with closed book. The exam isprepared in writing.For the practical part, a number of assignments are submitted during the semester anda final report with a demo of the project work is expected.

Calculation of the examination mark

Theoretical part: 2/3Practical part: 1/3