GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Algorithms and Data Structures (C002794)

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

Credits 6.0 **Study time 165 h**

Course offerings and teaching methods in academic year 2024-2025

A (semester 1)	Dutch	Gent	seminar
			lecture

Lecturers in academic year 2024-2025

Fack, Veerle	WE02	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bachelor of Science in Mathematics	6	A

Teaching languages

Dutch

Keywords

Algorithm, data structure, complexity analysis, algorithm design, abstract datatypes

Position of the course

Acquire basic skills in the domain of algorithms and data structures:
- learn to use common design techniques for algorithms;
- get acquainted standard data structures and theirimplementations.

Contents

- Design of algorithms
  - Algorithm complexity
  - Recursion
  - Brute force algorithms
  - Divide and conquer algorithms
  - Greedy algorithms
  - Graph algorithms
- Data structures
  - Stacks and queues
  - Hashtables
  - Linked lists
  - Binary search trees
  - Priority queues

Initial competences

Knowledge of the programming language Java and basic concepts of object-oriented programming, as taught in "Programming".

Final competences

1 The student can apply design techniques for algorithms and can implement standard data structures efficiently.
2 He/she can apply the new knowledge to practical problems and use it also in a research environment.

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

Seminar, Lecture

Study material

Type: Syllabus

Name: Syllabus: Algoritmen en Datastructuren
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Available on Ufora : Yes

Type: Handouts

Name: Handouts: Algoritmen en Datastucturen
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Available on Ufora : Yes

References

- Cormen T.E., Leiserson C.E. en Rivest R.L., "Introduction to Algorithms", MIT Press, 1990.
- D. E. Knuth,The Art of Computing Programming, vol I, II , III. Addisson-Wesley, 1968-1973.
- T. Roughgarden, "Algorithms Illuminated", Soundlikeyourself Publishing, 2017.
- Sedgewick R., "Algorithms in Java: Fundamentals, Data Structures, Sorting, Searching", Addison-Wesley, 2003.

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

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

Written assessment

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

Written assessment

Examination methods in case of permanent assessment

Oral assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Calculation of the examination mark

Continuous assessment (20%) + end-of-term evaluation (80%).