

Course Specifications

Valid in 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 to	eaching methods in academic ye	ear 2024-2025				
A (semester 1)	Dutch	Gent seminar				
			le	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	А	

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 objectoriented 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%).