

## Algorithms and Data Structures 2 (C003777)

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 2020-2021

A (semester 1)	Dutch	Gent	lecture	30.0 h
			seminar: coached	15.0 h
			exercises	
			seminar: practical PC	15.0 h
			room classes	

### Lecturers in academic year 2020-2021

Brinkmann, Gunnar WE02 lecturer-in-charge

### Offered in the following programmes in 2020-2021

	crdts	offering
<a href="#">Bachelor of Science in Computer Science</a>	6	A
<a href="#">Bachelor of Science in Mathematics</a>	6	A

### Teaching languages

Dutch

### Keywords

Algorithm, data structure, efficiency.

### Position of the course

Acquire more advanced skills in the domain of algorithms and data structures:

- learn to use common design techniques for algorithms;
- get acquainted with advanced implementations of standard data structures;

### Contents

- Design of algorithms
  - Dynamic programming
  - Backtracking, branch and bound, game strategies
  - Probabilistic algorithms
- Data structures
  - Amortised complexity analysis
  - Variants of linked lists
  - Self-adjusting data structures
  - Balanced search trees
  - Advanced priority queues
  - Representing disjoint sets

(some topics not every year)

### Initial competences

Being able to apply the contents of the course "Algorithms and Data structures 1".

### Final competences

- 1 The student can apply advanced 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

Lecture, seminar: coached exercises, seminar: practical PC room classes

#### Extra information on the teaching methods

Classroom lectures;  
Classroom exercises;  
Lab sessions on PC;  
Electronic teaching environment.

#### Learning materials and price

Lecture notes  
Website Cost: 0 EUR

#### 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. Addison-Wesley, 1968-1973.  
Sedgewick R., "Algorithms in Java: Fundamentals, Data Structures, Sorting, Searching", Addison-Wesley, 2003.

#### Course content-related study coaching

Student coaching in the classroom exercise sessions and lab sessions on PC.  
Use of an electronic teaching environment.

#### Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions

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

Written examination with open questions

#### Examination methods in case of permanent evaluation

Written examination with open questions, oral examination, assignment, skills test

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

#### Extra information on the examination methods

Non-periodical evaluation: graded programming project with oral defence.

#### Calculation of the examination mark

Non-periodical evaluation 20% -- periodical evaluation 80%.