

Informatics (E015041)

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

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2023-2024

A (Year)	Dutch	Gent	lecture
			independent work
			seminar

Lecturers in academic year 2023-2024

Dhoedt, Bart	TW05	lecturer-in-charge
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Offered in the following programmes in 2023-2024

	crdts	offering
Bachelor of Science in Engineering(main subject Biomedical Engineering)	6	A
Bachelor of Science in Engineering(main subject Chemical Engineering and Materials Science)	6	A
Bachelor of Science in Engineering(main subject Civil Engineering)	6	A
Bachelor of Science in Engineering(main subject Computer Science Engineering)	6	A
Bachelor of Science in Engineering(main subject Electrical Engineering)	6	A
Bachelor of Science in Engineering(main subject Electromechanical Engineering)	6	A
Bachelor of Science in Engineering(main subject Engineering Physics)	6	A
Bachelor of Science in Engineering (Joint Section)	6	A
Preparatory Course Master of Science in Biomedical Engineering	6	A

Teaching languages

Dutch

Keywords

Algorithm, programming, Python

Position of the course

This course is the first contact with computer science; it aims at introducing the basic terminology, the basic computer programming knowledge, and the "algorithmic thinking", using the Python programming language. This course is a prerequisite for the engineering disciplines "electrical engineering" and "computer science".

Contents

- Basis data types (variables, operations, operators)
- Control structures and lists (loops, decisions, functions, recursion)
- Exception handling (applied tot input/output)
- Introduction to algorithms and complexity
- Arrays in NumPy (homogenous arrays, arrays in higher dimensions, vectorisation, visualisation)
- More advanced data structures (strings, dictionaries and sets)
- Object orientation (class definition, (static) fields and methods, operator overloading, aggregation/composition, inheritance, polymorfism)

Initial competences

Secondary education.

Final competences

- 1 To master the structured programming paradigm and to realize a Python program, using this structured programming paradigm .
- 2 To master the basic concepts of objectorientation and to realize an objectoriented program in

Python.

3 To design an algorithm solving a given problem, and to assess the complexity of this solution.

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, Independent work

Learning materials and price

Electronic course material is freely available in Ufora.

References

- 1 A primer on scientific computing with Python, Hans Petter Langtangen, Springer
- 2 An introduction to Computation and Programming using Python, John V. Guttag, MIT Press
- 3 Learning Python, Mark Lutz, O'Reilly

Course content-related study coaching

The lecturer is available before and after classroom lectures. Personal coaching by the lecturer as scheduled. Additional tutoring services are available.

Assessment moments

end-of-term and continuous assessment

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

Written assessment open-book

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

Written assessment open-book

Examination methods in case of permanent assessment

Written assessment open-book

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

- During semester / permanent evaluation: four mandatory written tests with open book (exact dates will be announced at the start of each semester).
- During examination period: written open-book examination.

Calculation of the examination mark

Continuous assessment:

The scores on the four tests T1, T2, T3 and T4 (all marked out of 20), form a weighted score of respectively 20%, 30%, 20% and 30%, thus $T' = 0.2 T1 + 0.3 T2 + 0.2 T3 + 0.3 T4$

The total result of the permanent evaluation T, is determined as follows:

- if $T' < 10$ then $T = T'$
- if $10 \leq T' < 17$ then $T = T' + 3$
- if $T' \geq 17$ then $T = 20$

End-of-term evaluation: written examination (marked out of 20, score E)

Calculation of the final mark in the second-term examination period:

- If $E \geq 8$ then the final mark equals $\max(0.4 T + 0.6 E; 0.1 T + 0.9 E) - 2A$
- If $E < 8$ then the final mark equals $E - 2A$

A equals the number of tests for which the student was illegitimately absent ($A = 0, 1, 2, 3$ or 4). For each test in which the student did not participate, two points will be deducted from the final mark ($2A = 0, -2$ or -4).

Calculation of the final mark in the resit examination period:

- If $E \geq 8$ then the final mark equals $\max(0.4 T + 0.6 E; E)$
- If $E < 8$ then the final mark equals E

