

## Computer Science (E701053)

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 2)	Dutch	Gent	lecture	30.0 h
			seminar: practical PC room classes	30.0 h

### Lecturers in academic year 2020-2021

Brouns, Leen	TW05	staff member
Denert, Marleen	TW05	staff member
Naessens, Helga	TW05	lecturer-in-charge
Ongenae, Veerle	TW05	co-lecturer

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

	crdts	offering
<a href="#">Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology)</a>	6	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology)</a>	6	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Electromechanical Engineering Technology)</a>	6	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Electronics and ICT Engineering Technology)</a>	6	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Information Engineering Technology)</a>	6	A
<a href="#">Joint Section Bachelor of Science in Engineering Technology</a>	6	A
<a href="#">Master of Science in Teaching in Social Sciences (main subject Communication Science)</a>	6	A
<a href="#">Master of Science in Communication Science (main subject New Media and Society)</a>	6	A

### Teaching languages

Dutch

### Keywords

Programming, Python, HTML, CSS, databases, SQL, computer science (P170), informatics (P175), computer technology (T120)

### Position of the course

The purpose of this course is:

- to give insight into the role and operation of computers and networks;
- to learn to program, learn to think logically, learn splitting tasks into subtasks;

On the one hand, this course has a practical purpose:

- it learns to exploit the potential of computers, networks and applications more optimal
- it teaches the students to make their own programs for instance for calculations, processing data or simulations;
- it learns the students to make a simple website with the use of HTML and CSS.

On the other hand, this course has a broad educational value: it gives insight into abstract structures and processes, it develops analytical skills, the students learn to think modularly, they learn to solve problems themselves and to formulate appropriate solutions. The acquired theoretical knowledge and skills are used in many other areas (design, planning, optimization, ...).

## Contents

This course consists of several blocks.

Part 1 focuses on both hardware and software principles of computer operation:

- How does a computer work and how is it controlled?
- How are data stored, organized and structured? What are the most important file formats, eg for pictures, audio and video?
- How do computers communicate with each other? How does the Internet work?

In part 2 the students take the first steps to building algorithms. It teaches the students to program in Python. The following topics are covered: basics of structured programming (variables, sequence, selection, repetition) and of data structures and algorithms (functions, strings, lists, tuples, dictionaries, iteration, search, using files).

In addition, there is a short introduction to create web applications. What are the principles behind popular web applications? How are web pages and web forms made? Finally, an introduction to databases is given, including the following topics: principles and concepts of relational databases (tables, columns, rows, relationships) and simple SQL (with emphasis on SELECT).

## Initial competences

Scientific basic competences acquired in secondary education.

## Final competences

- 1 Being able to gain insight in the architecture, functionality and the components of a computer and network system.
- 2 Being able to gain insight in the representation of some important data types both internally in the computer and externally.
- 3 Knowing and being able to apply the basic concepts of programming in Python.
- 4 Being able to analyze and to structure a problem and to translate it into a computer program.
- 5 Being able to make independently simple web pages.
- 6 Being able to query or modify a database via simple SQL commands.

## 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: practical PC room classes

## Extra information on the teaching methods

Theory (30hrs): lectures and demonstrations. During the lectures the theory is explained step by step, partly based on examples.

Labs (30hrs): individual work on PC.

## Learning materials and price

Syllabus (Dutch) "Basiskennis Informatica, Webpagina's en Inleiding tot databanken", sold by student organisation (estimated cost: 5 euro)

Book "Practice of Computing Using Python, William F. Punch and Richard Enbody, Pearson." Purchase without obligation (estimated cost: 70 euro)

Slides, program examples and exercises are provided on the electronic learning environment

Books are available at the library.

## References

Practice of Computing Using Python, William F. Punch and Richard Enbody, Pearson

Think Python, Allen B. Downey, O'Reilly

Learning Python, Mark Lutz, O'Reilly

An introduction to Computation and Programming using Python, John V. Guttag, MIT Press

## Course content-related study coaching

The student can always make an appointment with the teacher.

## Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Participation, 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

Lectures: written examination

Labs: website, participation and/or quotation of submitted exercises in Dodona, optional test(s) Python

Calculation of the examination mark

Written examination lectures: 90%

Website and participation and/or quotation of submitted exercises in Dodona for the labs: 10%

If the student participated to a/the (optional) Python test, he can decide for himself whether or not to use the obtained points for a particular question of the examination. If the student does not solve the exam question, the score obtained for the test will be transferred for this question.

If the question is solved, the score of the test is not used (the points for that test are therefore not taken into account).

Facilities for Working Students

Contact the responsible professor