Computer Science (E701053)

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 2018-2019

A (semester 2)	Dutch	practicum	30.0 h
		lecture	30.0 h

Lecturers in academic year 2018-2019

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 2018-2019

	crdts	offering
Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology)	6	A
Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology)	6	A
Bachelor of Science in Engineering Technology (main subject Electromechanical Engineering Technology)	6	A
Bachelor of Science in Engineering Technology (main subject Electronics and ICT Engineering Technology)	6	A
Bachelor of Science in Engineering Technology (main subject Information Engineering Technology)	6	A
Joint Section Bachelor of Science in Engineering Technology	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, arrays, 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, practicum

Extra information on the teaching methods

Theory (30hrs): lectures and demonstrations.
Labs (30hrs): individual work on PC; presence required.

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 exercices are provided on the electronic learning environment
Books are available at the library.
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References

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, 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: permanent evaluation: participation, task and test

Calculation of the examination mark

In the first examination period:
Theory: 70%
Lab: 30%
In the second examination period: score = maximum (E, 30% L + 70% E), where L is the score of the lab and E the score of the exam in the second examination period.

Facilities for Working Students

Contact the responsable professor