

## Computer Science II (E701038)

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

Credits 3.0 Study time 90 h Contact hrs 30.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	practicum	18.0 h
		lecture	12.0 h

Lecturers in academic year 2018-2019

Naessens, Helga	TW05	lecturer-in-charge
Denert, Marleen	TW05	co-lecturer
Van Den Breen, Wim	TW05	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">Bachelor of Science in Engineering Technology (main subject Chemical Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Civil Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Electromechanical Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Electronics and ICT Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Engineering Technology (main subject Information Engineering Technology)</a>	3	A
<a href="#">Bachelor of Science in Civil Engineering Technology</a>	3	A
<a href="#">Bachelor of Science in Chemical Engineering Technology</a>	3	A
<a href="#">Bachelor of Science in Electronics and ICT Engineering Technology</a>	3	A
<a href="#">Bachelor of Science in Electromechanical Engineering Technology</a>	3	A
<a href="#">Bachelor of Science in Information Engineering Technology</a>	3	A

Teaching languages

Dutch

Keywords

Programming, Java, databases, Computer science (P170), Informatics (P175), Computer technology (T120)

Position of the course

The purpose of this course is:

- to learn to program, to think logically, to split tasks into subtasks;
- to learn to structure, to manipulate and to save data.

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

- it learns to make better use of the capabilities of computers and applications;
- it learns the students to make their own programs for instance for calculations, data processing or simulations.

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 on their own and to formulate appropriate solutions.

The acquired theoretical knowledge and skills are applicable in many other domains (design, planning, optimization, ...).

Contents

Advanced Java programming. The following topics are covered:

- repetition and deepening of control structures and object oriented programming
- exception handling
- use of Java-API: Math, Random, String, ...
- simple console applications and graphical user interfaces
- simple algorithms (sorting, manipulating tables, ...)
- use of collections and data structures

Introduction to databases. The following topics are covered:

- principles and concepts of relational database: tables, columns, rows, keys, relations
- simple SQL

#### Initial competences

Java programming: basic principles of object oriented programming (classes, objects, inheritance, methods, sequence, selection, iteration) and of data structures (variables, arrays).

Having followed the course Computer Science I.

#### Final competences

- 1 Being able to analyze a problem and to construct an algorithm for it.
- 2 Knowing and being able to apply the basic concepts of object oriented programming in Java (types, variables, iteration and selection, classes, objects, inheritance, polymorphism, interfaces, input by console and files, strings, ...).
- 3 Being able to use exception handling in Java.
- 4 Being able to make use of a number of collections in Java (Arraylist, HashSet, TreeSet, HashMap,...).
- 5 Being able to program a simple GUI (in Java).
- 6 Being able to query of to modify a database by 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

During the lectures the theory is explained step by step, partly based on examples. During the exercise sessions (attendance required) the student works independently on a PC.

#### Learning materials and price

The teacher's course (Dutch): 'Informatica II' - 160 pp. (estimated cost: max. 5 Euro). Slides, examples and exercises are provided on the electronic learning environment. Some books about the course topics are available in the library.

#### References

- "Head First Java", Bert Bates, Kathy Sierra
- "Java Swing", Marc Loy, Robert Eckstein, Dave Wood
- "PHP en MySQL de basis, 2e editie", Ghica van Emde Boas

#### 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 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

Participation, skills test

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

examination during the second examination period is possible in modified form

#### Extra information on the examination methods

The exam is a practical exam, consisting mainly of exercises, possibly complemented by a few theoretical questions.

### Calculation of the examination mark

Theoretical written examination: 60%

Lab: participation, test: 40%

A weighted average is used to compute the final score for a training item. However, if a student gains a score of 7 or less on 20 on one of the different parts of this course, there will be deviated from the calculated final score if it is 10 or more and the score of the student will be a 9/20.

The test of the labs can be retaken (possibly in modified form).