

## Computer Architecture (E034110)

**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 (semester 2)

Dutch

Gent

lecture

practical

seminar

**Lecturers in academic year 2023-2024**

De Bosschere, Koen

TW06

lecturer-in-charge

**Offered in the following programmes in 2023-2024**

**crdts**

**offering**

[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 Computer Science](#)

6

A

[Preparatory Course Master of Science in Bioinformatics\(main subject Engineering\)](#)

6

A

**Teaching languages**

Dutch

**Keywords**

assembly, micro-architecture, computer configurations

**Position of the course**

This course studies the structure and the operation of contemporary computer systems. It is the introduction to the hardware/software interface.

**Contents**

- Architecture and programming model: data representations, machine models, instruction sets, input/output
- Organisation and micro architecture: the data path, the control unit, the memory hierarchy, peripheral equipment, performance evaluation
- Code generation: code properties, optimisation
- The HiPEAC vision

**Initial competences**

Programming in C

**Final competences**

- 1 To understand machine language programs
- 2 To have knowledge about the elementary building blocks of computers
- 3 To understand the operation of a pipelined architecture
- 4 To understand the operation of the memory hierarchy
- 5 To know the contemporary challenges in computer architecture

**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, Practical

**Extra information on the teaching methods**

Practicals make use of the student's laptop

### **Learning materials and price**

Annotated slides and lab assignments freely available in the electronic learning environment.

### **References**

- D. Patterson en J. Hennessy, "Computer Organization & Design: the hardware/software Interface", Morgan Kaufman.

### **Course content-related study coaching**

Teaching staff.

### **Assessment moments**

end-of-term and continuous assessment

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

Written assessment

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

Oral assessment

### **Examination methods in case of permanent assessment**

Assignment

### **Possibilities of retake in case of permanent assessment**

examination during the second examination period is not possible

### **Extra information on the examination methods**

PE1: written open-book assessment.

PE2: oral closed-book assessment, written preparation at blackboard.

NPE: evaluation of practical report.

### **Calculation of the examination mark**

First examination period: NPE counts for 20% of the total score; no participation results in a zero for that part. The student must pass for the exam in order to pass for the course. If the student does not pass for the exam, the exam score becomes the end score.

Second examination period: same rule (the scores for the lab sessions are kept).

### **Facilities for Working Students**

There is no compulsory presence during the semester.