

## Design of Microsystems (E030900)

**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 2024-2025**

A (semester 1)

Dutch

Gent

lecture

**Lecturers in academic year 2024-2025**

Doutrelouigne, Jan

TW06

lecturer-in-charge

**Offered in the following programmes in 2024-2025**

[Master of Science in Electrical Engineering \(main subject Electronic Circuits and Systems\)](#)

**crdts**

6

**offering**

A

[Master of Science in Electrical Engineering](#)

6

A

**Teaching languages**

Dutch

**Keywords**

microsystems, intelligent interfaces, smart power technology, System on Chip (SoC), System in Package (SiP), System on Board (SoB), Multi Chip Module (MCM), IC design

**Position of the course**

To provide insight in the structure and operation of a microsystem.

To teach methodologies to design a complete microsystem step by step from the system level down to the physical layout level.

Training in the field of microsystem design by means of practical projects.

**Contents**

- Structure of a microsystem: Block diagram, Sensors, Actuators, Signal conditioning, AD and DA converters, Data processing unit, Output drivers
- Microsystem design methodologies: Selection of the implementation type, Selection of the integration technology, Design of integrated intelligent interfaces, "System on Chip" (SoC) design, Projects
- Appendix: Applications and data sheets

**Initial competences**

Design of analog circuits and building blocks, VLSI technology and design

**Final competences**

- 1 Analyse the operation of building blocks in microsystems
- 2 Understand the structure and properties of the main building blocks in a modern microsystem
- 3 Design and dimension a complex microsystem in an advanced smart-power IC technology on the basis of imposed specifications

**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, Practical

**Extra information on the teaching methods**

Classroom lectures; Project

## **Study material**

Type: Slides

Name: Extensive set of detailed PowerPoint slides about 4 chapters that can be downloaded for free from the Ufora website

Indicative price: Free or paid by faculty

Optional: no

Language : English

Number of Slides : 300

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

## **References**

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

Continuous guidance/support, for the theoretical classes as well as for the design project, during the whole semester by the responsible professor and a scientific coworker.

### **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**

Written assessment

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

Assignment

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

examination during the second examination period is possible in modified form

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

During examination period: written open-book exam

During semester: graded project reports. Second chance: Possible in adapted form

Frequency: The student must do 1 big design project (in group) that takes about one month and a half.

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

Evaluation throughout semester as well as during examination period. Special conditions: Non-periodic evaluation: 40% Periodic evaluation: 60%