GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

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

Doutreloigne, Jan	TW06	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)	6	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%