

## Design of Microsystems (E030900)

**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 2016-2017**

A (semester 1)	lecture	30.0 h
	project	30.0 h

**Lecturers in academic year 2016-2017**

Doutrelaigne, Jan	TW06	lecturer-in-charge
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**Offered in the following programmes in 2016-2017**

	crdts	offering
Master of Science in Electrical Engineering (main subject Electronic Circuits and Systems)	6	A
Master of Science in Biomedical Engineering	6	A
International Master of Science in Biomedical Engineering	6	A
Master of Science in Biomedical Engineering	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, project

**Extra information on the teaching methods**

Classroom lectures; Projects

**Learning materials and price**

Extensive set of English PowerPoint slides. Limited syllabus.

**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.

**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**

Report

**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**

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%