

## Electronic Systems and Instrumentation (E032010)

**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 2)	lecture	30.0 h
	practicum	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
<a href="#">Bachelor of Science in Engineering Physics</a>	6	A
<a href="#">Bachelor of Science in Electromechanical Engineering</a>	6	A
<a href="#">Bridging Programme Master of Science in Engineering Physics</a>	6	A

**Teaching languages**

Dutch

**Keywords**

Electronic instrumentation, analog and digital circuits, sensors and actuators, control systems, data-acquisition, system analysis

**Position of the course**

This course gives an introduction to electronic instrumentation. The course describes the analysis of electronic circuits (digital and analog), principles of electronic measurement, sensors, data-acquisition and signal processing of measurement data.

**Contents**

- Survey of electronic components and building blocks: active and passive components, analog building blocks, digital building blocks
- Analysis of analog and digital electronic circuits: transistor circuits, op-amp circuits, combinational and sequential digital circuits
- Analysis of complete open-loop and closed-loop electronic instrumentation systems

**Initial competences**

Electrical networks

**Final competences**

- 1 Understand the operation of the basic electronic components
- 2 Analyse basic analog and digital electronic circuits and think in a conceptual, analytical, system-oriented way about them.
- 3 Have the skills to perform numerical simulations of electronic circuits by means of standard models and methods, in particular PSpice.
- 4 Being able to build and experimentally evaluate analog and digital electronic circuits at breadboard level with sufficient accuracy, perseverance and critical reflection.
- 5 Have the skill to communicate about own design of electronic systems in writing and in graphics.

**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**

Classroom lectures; Lab sessions

**Learning materials and price**

course notes can be downloaded from Minerva for free.

**References**

- Referenties: E.O. Doebelin, "Measurement Systems", Mc. Graw-Hill, 4th Ed., New York (1990)

**Course content-related study coaching**

6 scientific coworkers are responsible for the guidance/support during the lab sessions.

**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**

Skills test

**Possibilities of retake in case of permanent evaluation**

examination during the second examination period is possible

**Extra information on the examination methods**

During examination period: written exam, partly closed-book theory, and partly closed-book exercises.

Permanent evaluation: individual closed-book lab exam at the end of the semester (calculations + circuit building + measurements on the circuit).

**Calculation of the examination mark**

During examination period: written exam that represents 2/3 of the total mark.

Permanent evaluation: lab exam that represents 1/3 of the total mark.