

## Electronic Systems and Instrumentation (E032010)

**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 2)

Dutch

Gent

lecture

practical

**Lecturers in academic year 2024-2025**

Doutreloigne, Jan

TW06

lecturer-in-charge

Bauwens, Pieter

TW06

co-lecturer

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

[Bachelor of Science in Engineering\(main subject Electromechanical Engineering\)](#)

**crdts** 6

**offering** A

[Bachelor of Science in Engineering\(main subject Engineering Physics\)](#)

6

A

[Bridging Programme Master of Science in Engineering Physics](#)

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 circuits and 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, Practical

**Extra information on the teaching methods**

Classroom lectures; Lab sessions

**Study material**

Type: Slides

Name: Extensive set of detailed PowerPoint slides about 3 chapters that can be downloaded for free from the Ufora website

Indicative price: Free or paid by faculty

Optional: no

Language : Dutch

Number of Slides : 370

Available on Ufora : Yes

Online Available : No

Available in the Library : No

Available through Student Association : No

**References**

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

**Course content-related study coaching**

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

**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**

Skills test

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

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.