GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2026-2027

Electronic Systems and Instrumentation (E032011)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time 90 h**

Course offerings and teaching methods in academic year 2026-2027

A (semester 2)	Dutch	Gent	practical	0.0h
			lecture	0.0h

Lecturers in academic year 2026-2027

Doutreloigne, Jan	TW06	lecturer-in-charge
Bauwens, Pieter	TW06	co-lecturer

Offered in the following programmes in 2026-2027	**crdts**	**offering**
Bachelor of Science in Engineering(main subject Engineering Physics)	3	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, principles of electronic measurement, sensors, data-acquisition and signal processing of measurement data.

Contents

- The operational amplifier: internal circuit, characteristics, use in combination with negative feedback, stability analysis, linear and non-linear applications
- Logic gates, flipflops, logic IC families
- Analysis of analog electronic circuits with operational amplifiers
- Study of a complete open-loop electronic measurement system: instrumentation and isolation amplifiers, active filters, analog multiplexers, analog-to-digital converters, microcontrollers

Initial competences

Electrical circuits and networks

Final competences

1 Analyse basic analog electronic circuits and think in a conceptual, analytical, system-oriented way about them.
2 Have the skills to perform numerical simulations of electronic circuits by means of standard models and methods, in particular LTspice.
3 Being able to build and experimentally evaluate analog electronic circuits at breadboard level with sufficient accuracy, perseverance and critical reflection.
4 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: Comprehensive set of detailed PowerPoint slides covering three chapters, available for free download via Ufora.
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Number of Slides : 220
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

3 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 (circuit building + measurements on the circuit + questioning).

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.