GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Electronics (C000925)

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

Poelman, Dirk	WE04	lecturer-in-charge

Offered in the following programmes in 2024-2025	**crdts**	**offering**
Bachelor of Science in Physics and Astronomy	6	A

Teaching languages

Dutch

Keywords

electronics, instrumentation

Position of the course

This course unit belongs to the learning pathway "Interdisciplinarity & Broadening" in the Bachelor program Physics and Astronomy.
The aim of this course is to teach physics students the principles of electronics and modern electronic instrumentation. A well trained master must be able to deal with common electronic instrumentation and understand the underlying principles.

Contents

Electrical networks, sensors, filters, properties of diodes, FETs and bipolar transistors, amplifiers, operational amplifiers, local and global feedback, oscillators, digital logic, digital electronics, A-D and D-A converters, data communication.

Initial competences

Having succesfully followed the course Electricity and Magnetism.

Final competences

1 Have insight in the important principles of analog and digital electronics.
2 Be able to properly use modern electronic components, circuits and instrumentation.
3 Have the necessary ICT-skills to perform electronics simulations and program microcontrollers.
4 Understand and process electronics literature on a bachelor level in an independent way.
5 Correctly handle electronics terminology (also in English).
6 Written and oral reporting on electronics and related subjects.

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, Independent work, Peer teaching

Extra information on the teaching methods

Lectures for the theoretical course.
Self-study of a personal project + presentation of this subject for all students.
Independent work: simulation exercises as individual assignment.

The practical exercises are organized in small groups. Simple electronic circuits are constructed on breadboards or soldered on PCB (printed circuit board). Measurement of the characteristics of these circuits.

Study material

Type: Handbook

Name: Electronics: A Systems Approach – 6th ed.
Indicative price: € 57
Optional: yes
Language : English
Author : Neil Storey
ISBN : 978-1-29211-406-4
Number of Pages : 841
Oldest Usable Edition : N. Storey, Electronics: A Systems Approach – 3rd ed.
Online Available : No
Available in the Library : Yes
Available through Student Association : Yes
Usability and Lifetime within the Course Unit : regularly
Usability and Lifetime within the Study Programme : one-time
Usability and Lifetime after the Study Programme : occasionally

Type: Handouts

Name: Electronics
Indicative price: Free or paid by faculty
Optional: no
Language : Dutch
Available on Ufora : Yes
Online Available : Yes
Available in the Library : No
Available through Student Association : No
Usability and Lifetime within the Course Unit : intensive
Usability and Lifetime within the Study Programme : one-time
Usability and Lifetime after the Study Programme : occasionally

References

(These books can be useful as background information, but are certainly not obligatory or necessary)
P. Horowitz, W. Hill, "The Art of Electronics", Cambridge Univ. Press ISBN 978-0521809269
http://web.mit.edu/6.101/www/reference/op_amps_everyone.pdf

Course content-related study coaching

After each lecture and during the practical exercises, questions can be asked. Personal coaching after electronic appointment.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Written assessment with open-ended questions

Examination methods in case of permanent assessment

Participation, Presentation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Closed book written exam for theory and exercises. The exam does not include a practical exercise.

Calculation of the examination mark

Periodical evaluation for the theory part (72.5%) and non-periodical evaluation for the personal presentation (15%), the practical exercises (7.5%) and the individual assignments (5%).

Facilities for Working Students

Working students can receive a customized assignment for the practical exercises.