GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2022-2023

Electronics (C000925)

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

Credits 6.0	**Study time 180 h**	**Contact hrs**	52.5h

Course offerings and teaching methods in academic year 2022-2023

A (semester 2)	Dutch	Gent	project	12.5h
			practicum	10.0h
			lecture	30.0h

Lecturers in academic year 2022-2023

Poelman, Dirk	WE04	lecturer-in-charge

Offered in the following programmes in 2022-2023	**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

Practicum, Lecture, Project

Extra information on the teaching methods

Lectures for the theoretical course.

Self-study of a personal project + presentation of this subject for all students.
The practical exercises are organized in small groups. The students can use PC's for circuit simulation and analysis. Simple electronic circuits are constructed on breadboards or soldered on PCB (printed circuit board). Measurement of the characteristics of these circuits.

Learning materials and price

Course book used: N. Storey, Electronics: A Systems Approach – 6th ed., Prentice Hall (2017), ISBN: 9781292114064 (55 Euro)
Handouts of course presentations and exercise notes are made available through Ufora.
Circuit simulation software (Circuitlogix, Simetrix, LTSpice, TinaTI) is freely available.

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
P. Scherz, S. Monk, Practical Electronics for Inventors, Tab Books ISBN 978-1259587542
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 examination with open questions

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

Written examination with open questions

Examination methods in case of permanent assessment

Report, 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 (70%) and non-periodical evaluation for the practical exercises (10%) and the individual project (20%)