GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Physics and Astronomy Laboratory 1 (C004211)

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 (Year)	Dutch	Gent	lecture
			independent work
			practical

Lecturers in academic year 2024-2025

Jachowicz, Natalie	WE05	lecturer-in-charge
De Rijcke, Sven	WE05	co-lecturer

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

Teaching languages

Dutch

Keywords

Laboratory Physics

Position of the course

This course unit belongs to the learning pathway "Experimental physics and astronomy; data processing" in the Bachelor program Physics and Astronomy.

- Learning the necessary skills to perform independently experiments, to analyse data and to deduce physically meaningful results.
- Getting acquainted with reporting the principles and the results of the performed experiment.
- Taking into account error analysis and the reliability of the results obtained.

Contents

In the formal part (A) the objectives and the methodology, including data treatment, of the experiments are explained: Introduction to physical experimenting - Measuring physical quantities and error estimation - Error calculations - Error and statistics - Data treatment - Reporting - LateX and gnuplot. In the practical part (B), the student performs a number of experiments related to mechanics, optics, fluids, electricity and astrophysics.

Initial competences

This course deals with basic physics experiments and essentially needs no prior knowledge of physics. However, notions of physics on a secondary school level with respect to mechanics, optics and electricity are recommended

Final competences

1 Knowing and applying the basic concepts and methods of physics, using models and techniques necessary for the problems at hand.

2 Being aware of the fact that every theory in physics has to be verified experimentally. Being able to perform an experiment in an independent and accurate way, and to analyse the data and interpret the results with the application of appropriate error analysis.

3 Show physical intuition, creativity and accuracy, being able to judge the correctness of the obtained results in a critical way.
4 The student is able to write a succinct report with an appropriate use of the physical terminology. The student has the ICT competences necessary for word and dataprocessing and presentation (LaTeX, gnuplot).
5 Present the results of an experiment orally.

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

Extra information on the teaching methods

- Introductory lectures: Oral class,
- Guided laboratory sessions: Individual experiments
- Homework: drawing up the report, design and conduct a basic physics experiment

Study material

Type: Syllabus

Name: Short syllabus and laboratory texts
Indicative price: € 10
Optional: no

References

- John R. Taylor : An Introduction to Error Analysis - The study of Uncertainties in Physical Measurements, Oxford University Press, ISBN 0-935702-10-5
- G.L. Squires : Practical Physics, Cambridge University Press, ISBN 0-52127095-2 Syllabi : Mechanics, Waves and Optics, Electricity and Magnetism
- Douglas C. Giancoli, Natuurkunde deel 1 Pearson, ISBN 90-430-1324-6

Course content-related study coaching

The students can test their practical knowledge and skills via the interaction during the lab sessions. There is always opportunity for individual consultation with the assistant. Explanation of more general aspects can be obtained by electronic way or by personal contact after each class or by appointment. Interaction with teaching staff or among the students is possible via Ufora.

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

Skills test, Participation, Presentation, Peer and/or self assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

- Written examination with open book on the insight in the various experiments, the analysis of experiments and error analysis

Calculation of the examination mark

- Permanent evaluation (70%)
- Periodic evaluation (30%)

Lab assignments and student presentations are mandatory. Students who eschew period-aligned and/or non-period-aligned evaluation may be failed by the examiner.