GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Electricity and Magnetism (I700209)

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

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2025-2026

A (semester 1)	Dutch	Gent	seminar
			lecture

Lecturers in academic year 2025-2026

Verstraelen, Toon	WE05	lecturer-in-charge

Offered in the following programmes in 2025-2026	**crdts**	**offering**
Bachelor of Science in Bioscience Engineering Technology	4	A
Linking Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Horticulture)	4	A
Linking Course Master of Science in Bioscience Engineering Technology: Agriculture and Horticulture (main subject Plant and Animal Production)	4	A
Linking Course Master of Science in Biochemical Engineering Technology	4	A
Linking Course Master of Science in Bioscience Engineering Technology: Food Industry	4	A

Teaching languages

Dutch

Keywords

Electricity, magnetism, charge, electrostatics, potential difference, capacitors, DC and AC current, electromagnetic induction, motors, electromagnetic waves.

Position of the course

Within the field of agriculture, food, horticulture and biochemistry, electrical components and electrical machines are very widely used. Therefore it is important that the students are familiar with the basic laws of electricity and the operation principle of electrical machinery control.

Contents

- Electric charge, electric field.
- Gauss' law.
- Electric potential.
- Electrostatic energy and capacitors.
- DC current and resistors.
- DC circuits.
- Magnetic field.
- Electromagnetic induction and Faraday's law.
- AC current and circuits (motors, generators and transformers, RLC circuits).
- Electromagnetic waves.

Initial competences

This course builds on certain final competences of "Calculus I" (I700266), "Linear Algebra and Calculus II" (I700267), "Mechanics, oscillations and waves" (I700198); or equivalent competences acquired by other means.

Final competences

1 Understand and explain the basic principles, laws and techniques of electromagnetism.
2 Use of laws of electromagnetism in a biotechnological context.
3 Analyze and solve basic electrical networks.

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

Seminar, Lecture

Extra information on the teaching methods

- Lectures, including plenary exercises (24 u).
  Lectures demand active participation of students by e.g. using concept questions.
- Guided exercises Electricity (18 u).

Study material

Type: Handbook

Name: Natuurkunde deel 2 Elektriciteit, magnetisme, optica en moderne fysica
Indicative price: € 90
Optional: no
Language : Dutch
Author : Douglas C. Giancoli
ISBN : 978-9-04303-872-0
Number of Pages : 977
Oldest Usable Edition : 4
Online Available : Yes
Usability and Lifetime within the Course Unit : intensive
Usability and Lifetime within the Study Programme : regularly
Usability and Lifetime after the Study Programme : occasionally

References

See learning materials.

Course content-related study coaching

Guided problem solving. Possibility to ask questions before and after the theory lectures, and online.

Assessment moments

end-of-term and continuous assessment

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Extra information on the examination methods

Periodic evaluation: written exam (closed book) consisting of multiple-choice questions and open questions (theory and exercises).

Calculation of the examination mark

Periodic evaluation: exam, 100% of the total mark.

Facilities for Working Students

no extra facilities