

- DC circuits
- Magnetism
- Sources of magnetic field
- Elektromagnetic induction and Faraday's law
- Maxwell's equations, electromagnetic waves, relation to optics and spectroscopy

Exercises: guided problem solving of exercises that implement the theory, highlighting the practical implementations of the theory.

Initial competences

Students starting the second bachelor chemistry have already acquired basic knowledge of Physics (mechanics, waves, optics) and Mathematics (fundamental methods, trigonometry, calculus), which are an essential basis for the goals of this course. Students should therefore have followed the following courses in the chemistry program, or courses with an equivalent content in other programs: "Physics I: mechanics" and "Physics II: waves, optics and thermal physics" and "Mathematics I: fundamental methods".

Remark: simultaneously with the course Electromagnetism, the course Applied Mathematics is also lectured in the second bachelor chemistry, dealing with topics such as line integrals and vector analysis, which are also used in the Electromagnetism course.

Final competences

- 1 Have the ability to describe and analyse electrical and magnetical phenomena.
- 2 Have the ability to use and apply the various physics laws of electricity and magnetism.
- 3 Be able to recognise physical misconceptions in the popular media.
- 4 Have insight in orders of magnitude of physical quantities and measurement errors.

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

Online lecture, Lecture, Online seminar: coached exercises, Seminar: coached exercises

Extra information on the teaching methods

On - Campus Theory (20 lecture hours) and exercise sessions (5 x 2 hours)

Learning materials and price

Cost: Approximately 70 euro

- D. C. Giancoli, Natuurkunde, deel 2, 4e editie: Elektriciteit, magnetisme, optica en moderne fysica (English version available)
- Slides used during the theory and exercise lessons are made available for the students through Ufora.
- Formularium, available through Ufora.

Each student disposes of their own computer.

References

See teaching and learning material.

Course content-related study coaching

Guided problem solving. Possibility to ask questions before and after the theory lessons and electronically (Ufora). Feed back after announcement of the global evaluation results.

Assessment moments

end-of-term assessment

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

Written examination with multiple choice questions, Written examination with open questions

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

Written examination with multiple choice questions, Written examination with open questions

Examination methods in case of permanent assessment

Report

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Periodic evaluation: written exam (closed book with possibility to use an available formularium) with open questions and/or multiple-choice questions with standard setting and problem-solving as open questions and/or multiple-choice questions with standard setting.

Non-periodic evaluation: written report on a computational project on electromagnetism, individual. Submission near end of the semester.

Calculation of the examination mark

Periodic Evaluation for theory and problem-solving at the end of semester (90%, 18/20) to probe the students' knowledge and insight in the theory - 50% (10/20) - and the ability to apply the basic laws of electromagnetism to practical problems - 40% (8/20).

Non-periodic evaluation of computational project for 10% (2/20). Non-participation to the computational project leads to a failure of the exam, viewed as non-justifiable absence, and non-deliberable marks of maximum 9/20, irrespective of the periodic evaluation.