GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2019-2020

Physics 3: Electricity and Magnetism (O000091)

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

Credits	5.0	Study time	150 h
Contact hrs	60.0 h		

Course offerings and teaching methods in academic year 2019-2020

A (semester 1)	English	seminar: coached exercises	20.0 h
		guided self-study	10.0 h
		lecture	30.0 h

Lecturers in academic year 2019-2020

Zhuiykov, Serge	KR01	lecturer-in-charge

Offered in the following programmes in 2019-2020	crdts	offering
Bachelor of Science in Environmental Technology	5	A
Bachelor of Science in Food Technology	5	A
Bachelor of Science in Molecular Biotechnology	5	A
Joint Section Bachelor of Science in Environmental Technology, Food Technology and Molecular Biotechnology	5	A

Teaching languages

English

Keywords

Electrical field, magnetic field, electro-magnetic waves, electric battery, resistors, electric circuits

Position of the course

Introduction in the field of electricity and magnetism

Contents

1. Introduction to electricity, electrical charge and electrical field
2. Gauss's Law and its applications
3. Relationship between electrical potential and electrical field
4. Capacitance, Dielectrics and Electric Energy Storages
5. Ohm's aw: Electric Currents and Resistance
6. DC Circuits
7. Magnets and Magnetic Fields
8. Sources and Magnetic Field
9. Faraday's Law and Electromagnetic Induction
10. AC Circuits; Inductance and Electromagnetic Oscillations
11. Electromagnetic Waves and Maxwell's Equations

Initial competences

Competences acquired in the yearlong course Physics 1 & 2. (O000134)

Final competences

1 *Possess in-depth knowledge about both electrical and magnetic phenomena and apply various physics laws of electricity and magnetism for practical applications.*
2 *Have insight and skills about the basic principle of electricity and magnetism.*
3 *Know how represent the electrical phenomena schematically in electric circuits and to model electrical processes to apply these when solving problems.*
4 *Demonstrate in-depth knowledge about electrical circuits and comprehend relevant latest development in the discipline.*
5 *Substantiate the relationship between the electrical and magnetic phenomena utilized in the practical devices.*

6 *Transfer the obtained knowledge to the modern electrical devices and instruments.*

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Guided self-study, lecture, seminar: coached exercises

Learning materials and price

Power-point slides will be available on Minerva

References

D. C. Giancoli (2009), Physics for scientists & engineers with modern physics, Chapters 21-31, Pearson-Prentice Hall.

Course content-related study coaching

The course trains physics, with a focus on both basic principles of electricity and magnetism and practical applications. The purpose of the course is to
i) make the students familiar with the numerous practical applications of electrical circuits and their components as well as magnetic and electromagnetic devices in everyday life,
ii) teach students about scientific experiments and measurement methods,
iii) teach students how to report their findings, and
iv) provide the foundations that will allow students to successfully participate in Physics 4.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions

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

Written examination with open questions

Examination methods in case of permanent evaluation

Participation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Calculation of the examination mark

Final written examination with open questions: 80%
Practical exercises: 20%