UCLouvain

linge1213

2023

Physics

4.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Walmsley Hagendorf Christian ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	*The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	The course is divided into two parts. The first part is a week-by-week presentation of the basic laws of electromagnetism, and their applications. It begins with an introduction to the laws of electrostatics in a vacuum, drawing on concepts studied in Physics 1. Students are shown how these laws are adapted to the study of dielectric and conducting materials. This is followed by lectures on aspects of the theory of circuits and magnetic fields in a vacuum and in matter. This part of the course ends with a study of magnetic induction phenomena and the development of an integrated approach towards the phenomenon of electromagnetism. The second part expands the concept of waves introduced in Physics 1 to the study of electromagnetic waves and ends with an introduction to optics. The experimental approach adopted in Physics 1, focused on determining the orders of magnitude in circuits and simple mechanical systems, is pursued in this course.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 General introduction to electromagnetism and electromagnetic waves
Evaluation methods	The evaluation consists of a written exam including a theoretical and an exercise part. The exam questions can be open or in the form of QCMs.
Teaching methods	The course is given in the form of : • lectures: the lecturer defines theoretical concepts and illustrates them with examples, applications or experiments of electromagnetism in the lecture hall; • exercise sessions: the teacher presents problems to the students and suggests solution methods; the students are invited to actively participate in the solution of the problems.
Content	Electrical Phenomenology - Electric forces and fields - Gauss's theorem - Electric energy and potential - Electric Capacity - Concepts of source, current, resistance - Ohm's and Kirchhoff's Laws - Elements of electrical circuits - Magnetic phenomenology - Magnetic forces and Fields - Sources of the magnetic field - Biot-Savart and Ampère's laws - Magnetic induction
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=7467
Bibliography	Tout est déposé sur le Moodle du cours, à l'exception du livre de référence
Other infos	Course entry requirements: It is recommended that the student has a good knowledge of mathematical analysis such as developed in LINGE1114 Mathematics: analysis (or equivalent) and of basic physics such as developed in LINGE1122 Physics I (or equivalent).
Faculty or entity in charge	ESPO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor : Business Engineering	INGE1BA	4	LINGE1114	🔍