UCL Université catholique de Louvain

LINGE1213

2015-2016

Physics

4.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Oestges Claude ; Francis Laurent ;
Language :	Français
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.
Aims :	General introduction to electromagnetism and electromagnetic waves *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content :	Part 1: Electricity and magnetism - Electrostatics in a vacuum - Electrostatics in matter - Ohm's and Kirchhoff's Laws - Aspects of electric circuits - source, resistance, capacity concepts - Magnetostatics in a vacuum - Magnetostatics in matter - Phenomena of magnetic induction - Electromagnetic fields Part 2: Waves and optics - Electromagnetic waves - Reflection - polarisation and refraction - Aspects of optics Methods: Lectures backed up by demonstrations, lab work, problem and exercise-centred learning, group work
Other infos :	Course entry requirements: Students should have completed Physics 1 (or equivalent) and Mathematics 1 (or equivalent). Course materials: BENSON Harris, Physics. Electricity and Magnetism Volume 2 and Volume 3 Waves-Optical and modern Physics, French Translation, De Boeck Université. Students wishing to improve their English would do well to use the English version of this work.
Faculty or entity in charge:	ESPO

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Bachelor in Business Engineering	INGE1BA	4	LINGE1114 **and** LINGE1122	