

5.0 credits	30.0 h + 30.0 h	1q
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Teacher(s) :	Craeye Christophe ; Janvier Danielle ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	Identical to description
Aims :	<p>This course provides a general background in electromagnetism, ending with a comparison with lumped elements electricity (circuit theory). At the end of this course, the students will be able to :</p> <ul style="list-style-type: none"> - write the equations and calculate the electrostatic and electromagnetic fields for various structures containing conductors and charges - understand the interaction between electromagnetic waves and materials and use properly the concepts of electric permittivity, magnetic permeability and conductivity to describe the materials for various applications - apply Maxwell's equations and boundary conditions to solve simple electromagnetic radiation problems - calculate the equivalent circuit (RLC) of a tri-dimensional structure under electromagnetic field <p><i>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".</i></p>
Content :	<ul style="list-style-type: none"> - Stationary field equations in vacuum : electromagnetic and magnetostatic - Solving methods and solving of static problems : method of image, conformal mapping and separation of variables - Materials : dielectric, magnetic, supraconductors and chiral, levitation - Maxwell's equations and their applications : relativity, Poynting, charges moving in electromagnetic fields, plasma, theorems (unicity, Babynet, ...) Green functions - Circuit elements : link with circuit theory, skin effect, eddy currents, magnetic circuits, limitations to the theory of lumped elements, introduction to distributed circuits.
Other infos :	<p>Teaching method :</p> <p>Lectures and practical exercises. Used as basis for ELEC1102 Projetc in Electricity 2 (second semester)</p> <p>Prerequisites :</p> <p>Foundations in electricity and magnetism</p> <p>Assessment :</p> <p>Written exam : exercices, with notes, and optional complementary oral examination</p>
Cycle and year of study :	<p>> Bachelor in Engineering</p> <p>> Bachelor in Mathematics</p> <p>> Master [120] in Physical Engineering</p> <p>> Master [120] in Mathematical Engineering</p>
Faculty or entity in charge:	ELEC