



Teacher(s)	Dehez Bruno ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Students are expected to master the following skills: basic knowledge in eletromagnetism and electrical machines, as they are covered within the courses LELEC1755 and LELEC1310
Main themes	<ul style="list-style-type: none"> <li>• Structure and working principle of the magnetically coupled devices (electromechanical converters, magnetic bearings, magnetic coupling and gears, ...)</li> <li>• Modelling (local/global, electric/magnetic/thermal, numerical/analytical) of these devices</li> <li>• Optimization of these devices</li> </ul>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>In consideration of the reference table AA of the program "Master in Electro-mechanical Engineering, professional focus in Mechatronics", this course contributes to the development, to the acquisition and to the evaluation of the following experiences of learning:</p> <ul style="list-style-type: none"> <li>• AA1.1, AA1.2, AA1.3</li> <li>• AA5.6</li> <li>• AA6.1, AA6.4</li> </ul> <p><b>Specific learning outcomes of the course:</b></p> <p>At the end of the course, the student will be able, based on the technical and scientific literature, to :</p> <p>1</p> <ul style="list-style-type: none"> <li>• Understand the working principle of any magnetically coupled devices (electromechanical transducers, magnetic bearings, and magnetic coupling gear, ...)</li> <li>• Establish the magnetic, electrical and thermal (elementary) model of such devices</li> <li>• Use these models to analyze and predict the behavior of such devices</li> <li>• Use these models to size or optimize these devices according to given specifications</li> </ul> <p>In addition, he/she will also be able to:</p> <ul style="list-style-type: none"> <li>• Perform a bibliographic search in scientific literature</li> </ul> <p>Perform a critical reading of a scientific article</p>
Evaluation methods	<p>Students will be evaluated on the basis of:</p> <ul style="list-style-type: none"> <li>• The preparation and the presentation of the thematic seminar;</li> <li>• The presentation and the report of the project;</li> <li>• A closed book oral exam focusing on the content of the thematic seminars.</li> </ul> <p>The final grade is the arithmetic average of the grades obtained for these three assessments.</p> <p>The grades awarded for the seminar and project may be individualised according to the student's involvement in the group during the semester (active participation in guidance/consultation sessions) or the mastery by the student shown during presentations.</p>
Teaching methods	<p>Teaching is organized in the form of:</p> <ul style="list-style-type: none"> <li>• Thematic seminars dealing with the content of one or more scientific papers. These seminars are prepared and presented in groups of 2 or 3 students. They are preceded by guidance sessions organized each week during the three weeks preceding the presentation of the thematic seminar. They are followed by a question-answer and restructuring session.</li> <li>• A project on the modeling and optimisation of an electromechanical converter. This assignment is carried out in groups of 2 or 3 students and leads to a report and/or a presentation.</li> </ul>
Content	The content varies from one year to another, and depends on the collection of scientific papers selected for the thematic seminars
Inline resources	Moodle

	<a href="https://moodle.uclouvain.be/course/view.php?id=1897">https://moodle.uclouvain.be/course/view.php?id=1897</a>
Bibliography	Collection d'articles en lien avec les thèmes du cours.
Faculty or entity in charge	ELME

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Electrical Engineering	<a href="#">ELEC2M</a>	5		
Master [120] in Electro-mechanical Engineering	<a href="#">ELME2M</a>	5		
Master [120] in Energy Engineering	<a href="#">NRGY2M</a>	5		