

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).


4 credits

30.0 h + 15.0 h

Q1

Teacher(s)	Bekemans Marc ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	<ul style="list-style-type: none"> <li>• Theory of electrical circuits</li> <li>• Semiconductor physics</li> <li>• Automatic control</li> <li>• Thermal behaviour</li> <li>• Magnetics</li> </ul> <p>in the frame of energy conversion and motor control with power semiconductor switches</p>
Aims	<p>In consideration of the reference table AA of the program "master in electrical engineering ", 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>• AA2.1, AA2.3, AA2.5</li> <li>• AA3.2, AA3.3</li> <li>• AA5.4, AA5.5</li> </ul> <p>More precisely at the end of the course students will be able to</p> <p>1</p> <ul style="list-style-type: none"> <li>• determine the electrical quantities inside a converter and at its terminals for DC-DC converters, inverters and rectifiers</li> <li>• evaluate the electrical and thermal stresses of active and passive components in power electronic converters</li> <li>• build and make use of the small signal model of a converter (in particular of a DC-DC converter)</li> <li>• size the main components of a converter on the basis of specifications</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• use an Excel file for sizing a converter</li> <li>• use a power electronic converter as a control device</li> </ul> <p>-----</p> <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>
Evaluation methods	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <p>Assesment of the practical work on the basis of reports issued by groups of 3 to 4 students (simulation and sizing of converters), (25 % of the final note),</p> <p>Written assesment without documentation (75 % of the final note) with a duration of 3 hours</p>
Teaching methods	<p><b>Due to the COVID-19 crisis, the information in this section is particularly likely to change.</b></p> <ul style="list-style-type: none"> <li>- lectures</li> <li>- tutored solving in groups of problems (simulation and sizing of converters) posted on iCampus</li> <li>- use of softwares (Simulink, Pspice, Excel')</li> </ul>
Inline resources	<p>Moodle</p> <p><a href="http://moodleucl.uclouvain.be/course/view.php?id=8136">http://moodleucl.uclouvain.be/course/view.php?id=8136</a></p>
Bibliography	<p>Références :</p> <ul style="list-style-type: none"> <li>- Fundamentals of Power Electronics, Robert W. Erickson ISBN 0-412-08541-0</li> <li>- Electronique de Puissance 10ème édition, G. Séguier, F. Labrique, Ph. Delarue, ISBN 978-2-10-073866-3</li> <li>- Composants à semi-conducteur pour l'électronique de puissance, S. Lefevre, F. Miserez, ISBN 2-7430-0719-2</li> <li>- Transparents sur Moodle</li> </ul>

Faculty or entity in charge	ELEC
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<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electrical Engineering	<a href="#">ELEC2M</a>	4		
Master [120] in Electro-mechanical Engineering	<a href="#">ELME2M</a>	4		