

5.00 crédits	30.0 h + 30.0 h	Q2
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Enseignants	De Jaeger Emmanuel ;
Langue d'enseignement	Anglais > Facilités pour suivre le cours en français
Lieu du cours	Louvain-la-Neuve
Thèmes abordés	<ul style="list-style-type: none"> <li>• Electrical power systems engineering, focusing on:</li> <li>• Power system transients,</li> <li>• Power systems faulted operation,</li> <li>• Power systems protection,</li> <li>• Power systems stability,</li> <li>• Power systems reliability,</li> <li>• Power Quality</li> </ul>
Acquis d'apprentissage	<p><b>A la fin de cette unité d'enseignement, l'étudiant est capable de :</b></p> <p><b>Contribution of the course to the program objectives</b></p> <p>In view of the LO frame of reference of the "Master Electrical Engineering", this course contributes to the development, acquisition and evaluation of the following learning outcomes:</p> <ul style="list-style-type: none"> <li>- AA1.1, AA1.2, AA1.3</li> <li>- AA2.1, AA2.2</li> <li>- AA3.3</li> <li>- AA6.1</li> </ul> <p><b>Specific LO of the course</b></p> <p>Specifically, at the end of the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1 Identify, describe and analyze problematic situations regarding voltage disturbances (diagnosis, curative approach), transient behaviour and faulted operation in power systems</li> <li>Apply the principles of power system protection</li> <li>Prevent problematic situations at the planning or project stage of electrical grids and installations (preventive approach)</li> <li>Propose realistic solutions, from the technical and economic perspectives, and apply appropriate measures to improve power systems stability and solve power quality problems</li> </ol> <p>To this end, they will be able to:</p> <ul style="list-style-type: none"> <li>• Describe precisely, explain, model and quantify underlying physical phenomena and mechanisms,</li> <li>• Use specialized engineering software tools,</li> <li>• Interpret and correctly apply the standardization concepts,</li> <li>• Analyze and interpret information from technical and scientific literature relating to issues addressed in the course.</li> </ul>
Modes d'évaluation des acquis des étudiants	<p>Students will be assessed:</p> <ul style="list-style-type: none"> <li>- Based on homework carried out in groups of two during the semester;</li> <li>- Individually on the basis of a written or oral examination relating to the content of lectures and practice sessions</li> </ul> <p>To constitute the final mark, the weighting given to the homework is:</p> <ul style="list-style-type: none"> <li>- 50% if the mark of the individual exam is higher than 10/20;</li> <li>- 0% if the mark of the individual exam is less than 8/20;</li> <li>- linearly progressive between 0%, if the individual exam mark is 8/20, and 50%, if the exam mark is 10/20</li> </ul> <p>The homework cannot be redone; the mark is acquired in the quadrimester and kept in the event of a second session.</p>
Méthodes d'enseignement	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Practical sessions (<i>supervised classroom exercise sessions</i>)</li> </ul> <p><i>Engineering practice: supervised homework and projects in groups</i></p>
Contenu	<ul style="list-style-type: none"> <li>• Transient analysis of power systems</li> <li>• Dynamics of synchronous machines</li> <li>• Unbalanced operation of power systems and unsymmetrical faults analysis</li> </ul>

	<ul style="list-style-type: none"> <li>• Power systems protection</li> <li>• Power systems small-disturbance stability and large-disturbance (transient) stability</li> <li>• Frequency stability</li> <li>• Voltage stability</li> <li>• Power quality: basic concepts of electromagnetic compatibility, harmonics, voltage rapid fluctuations and flicker, voltage dips and interruptions, overvoltages</li> <li>• Reliability and quality of supply costs for a power system</li> </ul>
Ressources en ligne	<a href="https://moodle.uclouvain.be/course/view.php?id=739">https://moodle.uclouvain.be/course/view.php?id=739</a>
Bibliographie	<ul style="list-style-type: none"> <li>• Reference textbooks</li> </ul> <p><i>Electric Energy Systems - Analysis and Operation</i> (A. Gomez-Exposito, A.J. Conejo, C. Canizares)  <i>Handbook of Electrical Power System Dynamics</i> (M. Eremia, M. Shahidehpour)</p> <ul style="list-style-type: none"> <li>• Copy of the slides</li> </ul> <p>Complementary documentation</p>
Autres infos	<ul style="list-style-type: none"> <li>• This course is the logical follow-up of course LELEC2520. It is recommended to have previously completed the latter or an equivalent</li> </ul> <p>According to the opportunities and practical availability, the course can be completed by a technical visit and / or seminars given by experts from industry</p>
Faculté ou entité en charge:	ELEC

<b>Programmes / formations proposant cette unité d'enseignement (UE)</b>				
Intitulé du programme	Sigle	Crédits	Prérequis	Acquis d'apprentissage
Master [120] : ingénieur civil électricien	ELEC2M	5		