

5.00 credits

30.0 h + 30.0 h

Q1

Teacher(s)	Flandre Denis ;Oestges Claude ;
Language :	French
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	For the "Transmission Lines" part, • a test is normally (cfr. moodle) organised in November (exercises, with a form), • the exemption is acquired (but not mandatory) for a mark equal to or higher than 10/20, • the final mark for this part is the maximum between the mark obtained in the test and the mark obtained in January/August, as long as these marks are larger than or equal to 10/20. For the "Electronic Devices" part, • intermediate evaluation : a non-compulsary test could (cfr. moodle) be organized (certain years) on the 2 first chapters of the part on "electronic devices" during the 2nd half of the semester and would count for 20 % of the note for this part at the exam, if favorable for the student. • the evaluation done at the written exam organized in the exam session concerns all the chapters and features a part of theory and one of exercises. The final mark combines the marks obtained for the "Transmission Lines" part (out of 20) and the "Electronic Devices" part (out of 20), as follows: • if the 2 parts are either both passed (marks greater than or equal to 10/20) or both failed (marks less than 10/20), each part accounts for 50% of the final mark; • in the event of failure in only one of both parts, the weighting (in %) of the failed part is increased by a percentage equal to the shortfall (defined as the gap with the 10/20 threshold), to the detriment of the other part (for example, if one part is assessed at 7.6/20, and the other is passed, the failed part accounts for 52.4%, and the passed part, for 47.6%). Finally, it should be noted that exemption for one part is only valid for the current academic year.
Teaching methods	The course is organized around theoretical courses and exercise sessions.
Content	The first part of the course outlines the tools required to solve electromagnetcs and transmission line problems and enables students to put these tools into practice. Much attention is paid to the process of modeling practical problems and their equationing. The second part dedicated to electronic devices uses a similar approach. The equations are adapted and simplified in the case of semiconductors. On this basis, the physics of usual semiconductor devices is equated and the results compared to their real characteristics. The validity conditions of simple models, their limits and second-order corrections are widely discussed.
Inline resources	https://moodle.uclouvain.be/course/view.php?id=1128
Bibliography	Livre de référence pour la partie "Lignes de transmission" : Engineering Electromagnetics, Hayt et Buck, McGraw Hill, 7e édition, ainsi que des extraits disponibles sur moodle. Notes sur Moodle pour la partie "dispositifs électroniques". Quelques livres de référence sont disponibles à la BST : « Physique des dispositifs semi-conducteurs », De Boeck Université, J.-P. Colinge et F. Van de Wiele « Operation and modeling of the MOS transistor», Y. P. Tsividis, McGraw-Hill Book Company. "Physics of semiconductor devices", S. M. Sze, Wiley.
Faculty or entity in charge	ELEC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Specialization track in Electricity	FILELEC	5		
Master [120] in Physical Engineering	FYAP2M	5		
Mineure Polytechnique	MINPOLY	5		