

5.0 credits	30.0 h + 30.0 h	1q
-------------	-----------------	----

Teacher(s) :	Bayot Vincent (coordinator) ; Raskin Jean-Pierre ; Flandre Denis ; Francis Laurent ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	http://icampus.uclouvain.be/claroline/course/index.php?cid=LELEC2710
Main themes :	The course is focused on the physics of nanoscopic electronic systems ($\leq 100\text{ nm}$), i.e. 2D, 1D and 0D quantum systems, real quantum wells, ballistic quantum point contacts, electrons in a quantizing magnetic field, diffusion, coherent transport, resonant tunneling.
Aims :	<p>With respect to the AA referring system defined for the Master in Electrical Engineering, the course contributes to the development, mastery and assessment of the following skills :</p> <p>--</p> <p>AA1.1, AA1.2</p> <p>--</p> <p>AA2.1, AA2.2, AA2.5</p> <p>--</p> <p>AA3.1, AA3.2, AA3.3</p> <p>--</p> <p>AA4.1, AA4.2, AA4.3, AA4.4</p> <p>--</p> <p>AA5.3, AA5.4, AA5.5, AA5.6</p> <p>--</p> <p>AA6.1</p> <p>At the end of the course, students will be able to :</p> <p>--</p> <p>Explain the basic properties of low-dimensional and nanoscopic electron systems.</p> <p>--</p> <p>Predict the behavior of simple nanoscopic devices, based on the knowledge acquired in the course and their project.</p> <p>--</p> <p>Synthesize and present orally the content of a major article in the field of nanoelectronics.</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>- Oral presentation of a scientific article to the other classmates.</p> <p>- Written evaluation on the content of the course</p>
Teaching methods :	<p>The courses present interactively the basics of nanoscopic devices and analyzes their behavior.</p> <p>The project focuses on understanding more deeply a chosen key device in nanoelectronics. This is based on a bibliographic research.</p>
Content :	Courses are oriented by student questions in order to enlight at best the numerous new concepts of nanoelectronics. Students work on specific developments that are then shared with the other classmates.
Bibliography :	Syllabus, slides, book: The physics of low-dimensional semiconductors, J.H. Davies, Cambridge
Other infos :	Background in solid state physics and basic semiconductor devices (e.g. : LELEC 1330)
Faculty or entity in charge:	ELEC

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Electrical Engineering	ELEC2M	5	-	
Master [120] in Physical Engineering	FYAP2M	5	-	
Master [120] in Chemical and Materials Engineering	KIMA2M	5	-	