UCL Université catholique de Louvain

LELEC2541

2010-2011

Advanced electronic devices

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Raskin Jean-Pierre ; Bayot Vincent (coordinator) ; Flandre Denis ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	Identical to the contents of the course
Aims :	At the end of the course, the students will be able to - understand the physical behavior and the models of advanced electronic devices (semiconductors) of the new generation, in a large range of temperatures and frequencies; - use numerical simulation softwares and characterization techniques for comparing various novel semiconductor devices; - go from theoretical concepts to the analysis and modeling of advanced devices or the integration of these in microwave circuits in the framework of other specific courses or of their master thesis. *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".*
Content :	This course is following up the course ELEC1330 "Electrical Physics". The objective is the study of advanced devices recelty proposed in the scientific literature and more particularly, their performance in terms of commutation speed, frequency behavior, noise, temperature, etc. The leading idea is to highlight the link between physical phenomena, semiconductor materials, fabrication technologies and device properties. The numerical simulation tools as weel as the measurement technique will be introduced. The main topics taught will be - special semiconductors (heterostructures, SOI, III-V, etc...) - High Mobility Transistor (HEMT), Junction Field Effect Transistor (JFET), Metal Semiconducto Field Effect Transistor (MESFET) - diodes, bipolar transistors and MOS in nanoscale regime and at high frequencies
Other infos :	Prerequisites : Basic formation in quantum electronics; Physical electronics and solid-state physics Teaching method : 14 lectures, 3 experimental studies in laboratories, 1 project in small groups (2 to 3 students) Could be given in English
Cycle and year of study :	> Master [120] in Chemical and Materials Engineering > Master [120] in Electrical Engineering > Master [120] in Electro-mechanical Engineering > Master [120] in Physical Engineering
Faculty or entity in charge:	ELEC