LELEC2560

2013-2014

Micro and nanofabrication techniques

5.0 credits	30.0 h + 30.0 h	2q

Teacher(s) :	Bayot Vincent ; Raskin Jean-Pierre ; Francis Laurent ; Hackens Benoît ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	> http://icampus.uclouvain.be/claroline/course/index.php?cid=LELEC2560
Prerequisites :	Background in electronic devices, physics and chemistry
Main themes :	Processing of micro and nanoscopic devices, MEMs, NEMs, and integrated circuits : - semiconductor materials and their processing, - oxidation, ion implantation ionique, doping, metallisation, plasma... - micro & mp; nanolithography, laser machining, etc. - micro & mp; nanocharacterisation : SEM, AFM, Ellipsometry, Dektak,...
Aims :	- AA1.1, 1.2, 1.3, AA 2.1, 2.2, 2.3, 2.4, 2.5, AA3.1, 3.2, 3.3, AA4.1, 4.2, 4.3, 4.4, AA5.1, 5.2, 5.3, 5.4, 5.5, 5.6, AA6.1 At the end of the course, the students will be able to : - Design the process of a particular micro & mp; nanoscopic device. - Use process simulation tools - Make specific process steps in the clean rooms - Characterize step results in WinFab and Welcome platforms *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".*
Evaluation methods :	Report and oral exam in group
Teaching methods :	A few courses set the ground of major processing techniques. Students then choose a project and design a process based on available informations (icampus) and bibliography. They interact frequently with a researcher in the field. They finally realize& mp; characterize the designed steps in WinFab and Welcome.
Content :	The content of this course is the following : decription of fabrication processes for semiconductor integrated devices and circuits, material deposition methods, oxidation, implantation, doping, photolithography, electron-beam lithography, wet ande dry etching, plasma surface treatments, etc. A first project based on the use of numerial simulation tools will help the students to learn more about modelling of fabrication procedures and characterization of integrated devices. The students will have the opportunity to realize some key fabrication steps of a particular complete process flow in the cleanroom facilities during a second project.
Bibliography :	See iCampus course site
Cycle and year of study :	> Master [120] in Chemical and Materials Engineering > Master [120] in Biomedical Engineering > Master [120] in Electro-mechanical Engineering > Master [120] in Physical Engineering > Master [120] in Electrical Engineering
Faculty or entity in charge:	ELEC