UCL Université catholique de Louvain

LELEC1530

2012-2013

Basic analog and digital electronic circuits

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Legat Jean-Didier ; Flandre Denis ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	LELEC 1370 : Measurements and electrical circuits or equivalent
Main themes :	Identical to description
Aims :	At the end of this course, the students will be able to: -- Understand how the basic components work: the diode, bipolar and MOS transistors -- Understand and simulate the basic circuits of a 1-transistor amplifiers in the three basic configurations -- Understand the architecture of operational amplifiers (CMOS and bipolar OpAmps) and the main building blocks -- Understand, simulate and synthesize CMOS logic gates in various styles -- Understand how the main types of memory work *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 :	The evaluation is based on the work during the semester and a written examination on the theoretical part of the course and exercises
Teaching methods :	Learning is based on courses with compulsory homework (SPICE circuit simulations) and exercises sessions
Content :	-- Diode -- MOS and bipolar transistors -- 1-transistor amplifiers (bipolar and MOS), study of the three basic configurations -- Frequency response -- CMOS operational amplifier and the associated basic blocks (differential pair, current mirror, active load, frequency response) -- Bipolar operational amplifier and the associated basic blocks (differential pair, current mirror, active load, output stage, protection, frequency response) -- CMOS digital circuits: CMOS inverter -- Advanced CMOS digital circuits: pseudo-NMOS digital circuits, MOS pass transistors, dynamic MOS circuits -- Memories: latch, D flip-flop SRAM, DRAM, ROM, Flash
Bibliography :	Microelectronic Ciruits by Sedra/Smith - Oxford University Press
Cycle and year of study :	> Bachelor in Engineering
Faculty or entity in charge:	ELEC