LELEC2580

2015-2016

Design of RF and microwave communication circuits

5.0 credits	30.0 h + 30.0 h	2q

Teacher(s) :	Janvier Danielle ; Craeye Christophe ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	Moodle > http://moodleucl.uclouvain.be/course/view.php?id=9021
Main themes :	This course is a part of the "Microwaves" orientation in the Master in Electricity. LELEC2580 is dedicated to design of active emitting and receiving front-ends at RF and microwave frequencies.
Aims :	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 : -- AA1.1, AA1.2, AA1.3 -- AA2.1, AA2.2, AA2.4 -- AA3.2 -- AA4.1, AA4.2 -- AA5.2, AA5.3, AA5.4, AA5.5 -- AA6.1 After this course the students will be able to : Design, simulate, draw the layout and measure the various elements of an RF or microwave front end: o low-noise amplifier o Filters and matching circuits o Mixer o Oscillator o Active antenna *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 examination is a project that is evaluated on the basis of a written report and a presentation
Teaching methods :	The course includes 12 theoretical lectures Training modules with tutorial on ADS and IE3D softwares A project, using ADS design program of Agilent, where each student individually has to design, simulate and measure an active device.
Content :	The course will provide students with necessary knowledge and tools for designing RF and microwave active circuits. Topics addressed include: -- Generalized S-parameters and design of matching circuits -- Microwave models for transistors (equivalent circuits and noise parameters) -- Design methodology for microwave amplifiers -- Microwave and RF oscillators -- Microwave and RF mixers -- Beamforming architectures, narrow-band and UWB -- Real-time processing for multiple-antenna systems --

	Applications to radar, RFID and MIMO systems
Bibliography :	-- Slides available on Moodle -- Reference textbooks available in UCL public library
Other infos :	LELEC2700 (Microwaves), and LELEC2910 (Antennas and propagation) are highly recommended previously to LELEC2580
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	-	