UCLouvain

lelec2580

2017

Design of RF and microwave communication circuits

5 credits	30.0 h + 30.0 h	Q2

Teacher(s)	Craeye Christophe ;Janvier Danielle ;
Language :	English
Place of the course	Louvain-la-Neuve
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	In consideration of the reference table AA of the program "master in electrical engineering ", this course contributes to the development, to the acquisition and to the evaluation of the following experiences of learning: • 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 1 • 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, as well as a written examination.
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
Inline resources	Moodle http://moodleucl.uclouvain.be/course/view.php?id=9021
Bibliography	• Transparents disponibles sur Moodle • Livres de référence disponibles à la BST
Other infos	LELEC2700 (Microwaves), and LELEC2910 (Antennas and propagation) are highly recommended previously to LELEC2580

Faculty or entity in charge	ELEC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Electro-mechanical Engineering	ELME2M	5		
Master [120] in Electrical Engineering	ELEC2M	5		
Master [120] in Physical Engineering	FYAP2M	5		