

MsC in Advanced Electronics Systems Engineering









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General overview

Location: Dijon, University of Burgundy, France

Tuition Fees : 475 €/ year

Course Language: English

Course duration: 1 year

Level: Second year of Master

Scholarships: Potential scholarships of 2500 € may be awarded depending on your results









Programme Objectives

The programme aims to:

- enable MSc graduates to become quickly operational in industry at engineer level in the field of electronics.
- train graduates to master advanced techniques in electronics. They will have acquired the necessary skills to model, develop and build analogical, numerical, RF or even microwave frequency electronic systems, complying with electromagnetic compatibility.
- provide the fundamentals of modern electronics in theory and in practice, relevant both to SME's and multinationals.







Scientific contents

CONTENTS	Lecture (H)	Tutorial (H)	Practical (H)	Total (H)	ECTS
Electromagnetic compatibility					
(EMC)	20	14	16	50	6
Sensors	20	10	20	50	6
RF Electronics	20	10	20	50	6
Programmable Logical Circuits	12	6	32	50	6
System Architecture	20	10	20	50	6
Local Culture		50		50	6
French as a foreign language		50		50	6
Practical in electronics				de ata	6
Training					12



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System Architecture



Module	System Architecture		ECTS	6
			duration (Lecture – Tutorial – Practical)	20 - 10 - 20
Language			French or English	
Contents		Lectures Introduction to embedded syste Soft CPU: OPENRISC On chip communication (Busse The Wishbone bus Network on Chip (NoC) Software/Hardware codesign Complex system modeling usin Lab session Lab 1 - OR1Ksim SoC platforn Lab 2 - Introduction to Verilog Lab 3 - Building a Simple Plat Lab 4 - UML system modeling	ems & System on Chip (SoC) es) ng UML2 m : simulation and debugging under Linux en form using Hardware accelerators and Wish	nvironment bone
Skills At the end of the module, the studen systems and on chip systems		students should be able to master the desi	gn of embedded	







Electromagnetic Compatibility (EMC)





Madala	EMC		ECTS	6
Module	EMIC		duration (Lectures – Tutorial – Practical)	20-14-16
Language			French or English	
Contents		Definition of ElectroMagnetic Interference (EMI). Radiation emitted by a guilty d Conductive coupling between Different factors causing EMI electromagnetic pulses, nuclea Laws, regulators, EMC directiv EMC design, grounfing and sh device. Decoupling or filtering, techno circuits, hybrid circuits,)	Compatibility (EMC) with effects of Electro levice and received by a victim device (Device the source and the receptor. damages (including electrostatic discharges, r electromagnetic pulses, power line surges, ves, ielding. Noisy circuits to be separated from t logy rules to reduce EMI in practical situatio	Magnetic ce Under Test). lightning). he rest of the ons (integrated
Skills		The aim of this Master course is electromagnetic waves and corr concrete aspects of unwanted edifferent devices, including the characteristics.	is to give a comprehensive coverage in the finnet in the finnet in the students will be able to take a suffects between different parts of a device or le choice of components, filters, accordingle	ield of into account the between ly to their EMC





Radiofrequency Electronics (RF)





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Modula	Dediefrequency	Flastronica	ECTS	6
Module	Radionequency	Electronics	duration (Lecture – Tutorial – Practical)	20-10-20
Language		French or English		
Contents		Design technique radiofrequent Waves Kurokawa. S parameter Simultaneous adaptation. Noise Specific circuits: couplers, split GaAs and SiGe technologies. Wireless RF systems: Wifi, Blu RFID Systems	cy and microwave. Stability of assets quadrupole parameters. e and amplification. tters, phase shifters netooth, ZigBee	
Skills		At the end of this course the stu microwave systems. It must als implement them.	ident should be able to master the design of l to be familiar to wireless technologies and be	RF and able to







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Programmable logic component





Modulo	Drogrammabla	agia component	ECTS	6
Widdule	Programmable logic component		duration (Lecture – Tutorial – Practical)	12 - 6 - 32
Language			French or English	
Contents Contents Structure and use of programmable Estimation of material resources in signal processing algorithms. Internal achitecture, Examples of a Real-time digital filters: application Implementation Methodology: des Applications: Real-time pattern re Partitioning and scheduling of task		rammable logic devices (FPGAs, specific p sources needed for the implementation of F ms. nples of signal and image processing. application to edged detection. Fast arithmer logy: design, simulation, verification. pattern recognition. Performance analysis. ng of tasks, methodology for dynamic recor	rocessors). PGA tic operators. nfiguration.	
Skills		Depth knowledge of the h and the specific developm systems based on program	nardware (electronic boards, specialized cor nent methodology for real-time processing nmable logic devices	nponents)







Sensors



Module	Sensors		ECTS duration (Lecture – Tutorial – Practical)	6 20-30-0
langue dans laquelle est dispensé le cours :		é le cours :	français	20 30 0
Contents		 Sensors: Models of sensors an Signal processing Numerical processing Identification. Data fusion Labs using Matlab and Labvie 	nd actuators ng ew	
Skills		At the end of the teaching, the leading to design and process	e students master the theory, methods and up data delivered by a large set of modern sense	-to-date tools









Practical in Electronics

Module Practical in Elec		etronics	ECTS	6
		dionies	duration (Lecture – Tutorial – Practical)	30-50-0
Language			French or English	
Language Literature review and existin Specifications drafted. Planning tasks. Design and implementation		Literature review and existing s Specifications drafted. Planning tasks. Design and implementation of	solutions. an electronic system.	
Skills The student will manage a project, taking into account the various step implementation. He will study also learn teamwork.		necessary for its		





French as a foreign language



Madula	Eronah as a famian languaga	ECTS	6		
Module	French as a foreign language	duration (Lecture – Tutorial – Practical)	0 - 50 - 00		
Language		French			
	Levels : Beginners to Advan	Levels : Beginners to Advanced			
	The courses follow the levels	The courses follow the levels defined by the Council of Europe :			
	A: Basic	User			
304	B: Indepe	endent User			
	C: Profic	C: Proficient User			
	Language classes and works	Language classes and workshops (compulsory at all levels)			
	Lectures on subjects of gener	Lectures on subjects of general cultural interest (compulsory for diploma courses)			
Contents	Optional courses				
	The language classes and wo documentary material.	The language classes and workshops use up-to-date language-learning methods and original documentary material.			
	Students are provided with f of each semester. Subjects i	Students are provided with full details of the lectures and optional courses at the beginning of each semester. Subjects include : History, Literature, Philosophy, Economics, Politics,			
	Art	Art			
	Workshops and cultural activ	Workshops and cultural activities			
Skills	The students should have im	proved their skills in French, whatever their in	nitial level		







Local culture



Module Local cult	I ocal cultura	Ira	ECTS	6	
	Local culture		duration (Lecture – Tutorial – Practical)	00 - 50 - 00	
Language			français – anglais		
		- To give a cultural dimension t	to the language		
		- To question what is culture, the distinction between cultures, the shaping of collective identities, the			
	(creation of stereotypes.			
Content		- To give cultural tips to facilitate the adaptation to the country of destination.			
		- To facilitate cultural exchange	es between students of different countries and promote a	closer and more	
	1	realistic approach to the comple	exity of intercultural communication.		
Skills		The students have a deeper knowledge of french way of life.			







Training period

12 weeks internship in industrial or research environment

Students are required to complete an internship of minimum 3 months, from mid-March until the end of June (an extension of time is possible up to the end of september).

This course can be carried out in an industrial company or in a research laboratory.

At the end of the internship, the student must prepare a Master thesis highlighting the industrial problem and the proposed solutions

Oral presentation session will be held for the student to defend his thesis.







Career Opportunities

- Expert in analogical, numerical and RF electronics
- Electronic card designer working with EMC standards
- Specialist in Electronic Design Automation (EDA)

The skills gained during the courses are fully acknowledged in industry and graduates can find positions in the private or public sector, in consulting firms, in the services industry, in SME's through to multinationals the following fields: electronics, robotics, signal engineering, Research & Development units, scientific or computer science committees.

It can also lead to research career.







Further information :

http://www-iem.u-bourgogne.fr/MASTER/MSCAESE/

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