Appendix A

CLUSTER Dual Master Agreement between

Instituto Superior Técnico (IST) and Université Catholique de Louvain (UCL)

Duration: Academic Year 08/09 to 10/11

Degree programme at IST:	**Master Program in Electrical and Computer Engineering (MEEC) Major: Telecommunications or Electronics** (120 ECTS)
Degree awarded:	M.Sc.
Language of instruction	English
Entrance admission criteria:	Bachelor of Science in Electrical and Computer Engineering Sciences
Degree programme at UCL:	**Master Program in Electrical Engineering (MEE)** (120 ECTS) Options: (1)Telecommunications or (2)Microwaves or (3)Information and signal processing or (3)Electronic Circuits and Systems
Degree awarded:	Master in Electrical Engineering
Language of instruction	English
Entrance admission criteria:	Bachelor in Engineering Sciences, preferably with major or minor in Electrical Engineering
Number of students	2

Schematic Study Plan

Option 1			
Year	Institution	Studies	Remarks
1	UCL	Compulsory and elective courses	60 ECTS
2	IST	Courses + Master Thesis (co-supervised)	30+30 ECTS
Option 2			
Year	Institution	Studies	Remarks
1	IST	Compulsory and elective courses	60 ECTS
2	UCL	Courses + Master Thesis (co-supervised)	30+30 ECTS
The schematic study plan is applicable to students originated from UCL or IST indifferently. The detailed study plan must be defined by the academic coordinators for each student.			

Contacts:

Academic responsible for the programme (MEEC): Prof. António Rodrigues	*Academic responsible for the programme (MEE)* Prof. Luc Vandendorpe
Contact person: Sílvia Santos, International Office (silvia.santos@ist.utl.pt)	*Contact person* Prof. Luc Vandendorpe (luc.vandendorpe@uclouvain.be)

Signatures:

Date: November 30th, 2007	Date: November 30th, 2007
For IST	For UCL
Prof. Carlos Matos Ferreira President, Instituto Superior Técnico	Prof. Jean-Didier Legat Dean, Louvain School of Engineering UCL
	Prof. Marc Lobelle, UCL Cluster Dual Masters coordinator
Prof. Paulo Teixeira Dean, Dept Electrical and Computer Eng.	Prof. Luc Vandendorpe, Academic responsible for program

This page is intentionally left blank

FIRST YEAR STUDIES	
IST (Major TELECOMMUNICATIONS)	UCL
Autumn Semester (minimum of 30 ECTS)	
Data Coding and Compression (6 ECTS)	Compulsory courses
Microwaves (6 ECTS)	ELEC 2531 Digital electronic circuits (5 ECTS)
Telecommunication Electronics (6 ECTS)	ELEC 2795 Radiation and radio communications systems (5 ECTS)
Digital Transmission (6 ECTS)	ELEC 2103 Project in Electronics and communications (5 ECTS)
	Elective courses: option in Telecommunications
Optional Courses Students must take 6 ECTS among these courses	ELEC 2796 Wireless communications (5 ECTS)
Telecommunications Systems (6 ECTS)	ELEC 2920 Communication networks (5 ECTS)
Radio Wave Propagation (6 ECTS)	Elective courses: option in Microwaves
Wireless Telecommunications Systems (6 ECTS)	ELEC 2910 Antennas and propagation (5 ECTS)
Integrated Services Networks (6 ECTS)	ELEC 2580 Design of RF and microwave communications circuits (5 ECTS)
Entrepreneurship, Innovation and Technology Transfer (6 ECTS)	Elective courses: option in Information and Signal Processing
	ELEC 2870 Artificial neural networks (5 ECTS)
	ELEC 2885 Image processing and computer vision (5 ECTS)
Spring Semester (minimum of 30 ECTS)	
Communication Theory (6 ECTS)	Compulsory courses
Antennas (6 ECTS)	ELEC 2900 Signal Processing (5 ECTS)
Computer Networks (6 ECTS)	INMA 1731 Stochastic processes: estimation and prediction (5 ECTS)
Signal Processing Electronic Systems (6 ECTS)	INGI 2315 Computer systems: Real time aspects (5 ECTS)
Mobile Communication Systems (6 ECTS)	Elective courses: option in Telecommunications
	ELEC 2880 Modem design (5 ECTS)
Optional Courses Students must take 6 ECTS among these courses	ELEC 2590 Seminar in Electronics and communications (5 ECTS)
High Frequency Electronics (6 ECTS)	INGI 2348 Information theory and coding (5 ECTS)
Audio and Video Communications (6 ECTS)	Elective courses: option in Microwaves
Telecommunications Systems and Networks (6 ECTS)	ELEC 2700 Microwaves (5 ECTS)
Wireless Mobile Networks (6 ECTS)	MECA 2300 Advanced numerical methods (5ECTS)
Photonics (6 ECTS)	ELEC 2590 Seminar in Electronics and communications (5 ECTS)
Engineering Management Projects (6 ECTS)	Elective courses: option in Information and Signal Processing
	INGI 2348 Information theory and coding (5 ECTS)

FIRST YEAR STUDIES	
IST (Major ELECTRONICS)	UCL
Autumn Semester (minimum of 30 ECTS)	
Power Electronics (6 ECTS)	Compulsory courses
Computer Electronics (6 ECTS)	ELEC 2531 Digital electronic circuits (5 ECTS)
Computer Networks (6 ECTS)	ELEC 2795 Radiation and radio communications systems (5 ECTS)
Digital and Analog Filters (6 ECTS)	ELEC 2103 Project in Electronics and communications (5 ECTS)
Optional Courses Students must take 6 ECTS among these courses	Elective courses: option in Electronic Circuits and Systems
Telecommunication Electronic Systems (6 ECTS)	ELEC 2620 : Logic Circuits and Systems (5 ECTS)
Instrumentation Supported in Personal Computers (6 ECTS)	ELEC 2660 : Power Electronics (4 ECTS)
Project of Digital Systems (6 ECTS)	Elective courses: option in Microwaves
Entrepreneurship, Innovation and Technology Transfer (6 ECTS)	ELEC 2580 Design of RF and microwave communications circuits (5 ECTS)
	Elective courses: option in Information and Signal Processing
	ELEC 2870 Artificial neural networks (5 ECTS)
	ELEC 2885 Image processing and computer vision (5 ECTS)
Spring (minimum of 30 ECTS)	
High Frequency Electronics (6 ECTS)	Compulsory courses
Microelectronics (6 ECTS)	ELEC 2900 Signal Processing (5 ECTS)
Sensors and Actuators (6 ECTS)	INMA 1731 Stochastic processes: estimation and prediction (5 ECTS)
Signal Processing Electronic Systems (6 ECTS)	INGI 2315 Computer systems: Real time aspects(5 ECTS)
Optional Courses Students must take 6 ECTS among these courses	Elective courses: option in Electronic Circuits and Systems ELEC 2532 : Analogue Electronics Circuits (5 ECTS)
Electronics of Interfaces (6 ECTS)	ELEC 2760 : Synthesis and Optimization of logic circuits and systems (5 ECTS)
Object Oriented Programming (6 ECTS)	Elective courses: option in Microwaves
Audio and Video Communications (6 ECTS)	ELEC 2700 Microwaves (5 ECTS)
Engineering Management Projects (6 ECTS)	MECA 2300 Advanced numerical methods (5 ECTS)
	Elective courses: option in Information and Signal Processing
	INGI 2348 Information theory and coding (5 ECTS)

SECOND YEAR STUDIES	
IST (Major TELECOMMUNICATIONS)	UCL
Autumn Semester (minimum of 30 ECTS)	
Students must take at least 30 ECTS from these courses:	*Students must take at least 30 ECTS according with the student's mentor.*
Entrepreneurship, Innovation and Technology Transfer (6 ECTS)	Elective courses: option in Telecommunications
Engineering Management Projects (6 ECTS)	ELEC 2796 Wireless communications (5 ECTS)
Energy Systems for Telecommunications (6 ECTS)	ELEC 2920 Communication networks (5 ECTS)
Radio Wave Propagation (6 ECTS)	
Wireless Telecommunications Systems (6 ECTS)	Elective courses: option in Microwaves
Digital Transmission (6 ECTS)	ELEC 2910 Antennas and propagation (5 ECTS)
Autonomous Systems (6 ECTS)	ELEC 2580 Design of RF and microwave communications circuits (5 ECTS)
Telecommunication Electronics (6 ECTS)	
Radio Wave Propagation (6 ECTS)	Elective courses: option in Information and Signal Processing
Telecommunications Systems (6 ECTS)	ELEC 2870 Artificial neural networks (5 ECTS)
Data Coding and Compression (6 ECTS)	ELEC 2885 Image processing and computer vision (5 ECTS)
Microwaves (6 ECTS)	
Telecommunications Management and Public Policies (6 ECTS)	Other courses are available
Mechanisms for Quality of Service Support in the Internet (6 ECTS)	
Integrated Services Networks (6 ECTS)	
Elective course (6 ECTS)	
Other courses chosen in accordance with student's mentor	Other courses chosen in accordance with student's mentor
Spring Semester (minimum of 30 ECTS)	
Thesis related activities 30 ECTS supervised by both partners (note: in UCL work on the thesis may be spread over the whole second year)	

SECOND YEAR STUDIES	
IST (Major ELECTRONICS)	UCL
Autumn Semester (minimum of 30 ECTS)	
Students must take at least 30 ECTS from these courses:	*Students must take at least 30 ECTS according with the student's mentor:*
Entrepreneurship, Innovation and Technology Transfer (6 ECTS)	Elective courses: option in Electronic Circuits and Systems
Engineering Management Projects (6 ECTS)	ELEC 2570 : Implementation of Embedded Digital Systems (5 ECTS)
Advanced Computer Architectures (6 ECTS)	ELEC 2650 : Analogue Integrated Circuits (5 ECTS)
Analog Integrated Systems (6 ECTS)	ELEC 2590 : Seminar in Electronics and Communications (3 ECTS)
Simulation and Test of Electronics Systems (6 ECTS)	
Measurement Systems in Radiofrequency (6 ECTS)	Elective courses: option in Microwaves
Information Systems and Databases (6 ECTS)	ELEC 2910 Antennas and propagation (5 ECTS)
Data Coding and Compression (6 ECTS)	ELEC 2580 Design of RF and microwave communications circuits (5 ECTS)
Elective course (6 ECTS)	Elective courses: option in Information and Signal Processing
	ELEC 2870 Artificial neural networks (5 ECTS)
Other courses chosen in accordance with student's mentor	ELEC 2885 Image processing and computer vision (5 ECTS)
	Other courses are available
	Other courses chosen in accordance with student's mentor
Spring Semester (minimum of 30 ECTS)	
Thesis related activities 30 ECTS supervised by both partners (note: in UCL work on the thesis may be spread over the whole second year)	