

## Appendix C

**CLUSTER Dual Master Agreement between  
Instituto Superior Técnico (IST) and Université Catholique de Louvain (UCL)**

Duration: Academic Year 13/14 to 18/19

Degree programme at IST:	<b>Master Program in Communication Networks Engineering (MERC) (120 ECTS)</b>
Degree awarded:	M.Sc.
Language of instruction	English
Entrance admission criteria:	Bachelor in Communication Networks Engineering (LERC) or Bachelor in Information Systems and Computer Engineering (LEIC)
Degree programme at UCL:	<b>Master Program in Computer Engineering (MCE) (120 ECTS)</b> Option Networking and Security or <b>Master program in Computer Science (MCS) (120 ECTS)</b> Option Networking and Security
Degree awarded:	Master in Computer Engineering (if bachelor degree in engineering or engineering sciences) or Master in Computer Science
Language of instruction	English
Entrance admission criteria:	Bachelor in Engineering Sciences, with major or minor in Computer Engineering or Bachelor in Computer Science
Number of students	2 per year

Notes: 1. The program is open to students holding a bachelor in Computer Science or Computer Engineering from IST or UCL / 2. Students who own a bachelor in engineering may get the master in computer engineering of UCL. Other students get the master in computer science of UCL.

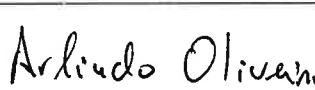



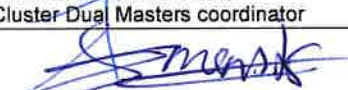
**Schematic Study Plan**

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
<b>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.</b>			

**Contacts:**

<i>Academic responsible for the programme (MERC):</i> Prof. Luis Rodrigues	<i>Academic responsible for the programme (MCE and MCS)</i> Prof. Luc Kim Mens
<i>Contact person:</i> Silvia Santos, International Office (silvia.santos@ist.utl.pt)	<i>Contact person</i> Prof. Kim Mens(kim.mens@uclouvain.be)

**Signatures:**

Date:	Date:
For IST	For UCL
 Prof. Arlindo Oliveira President, Instituto Superior Técnico	 Prof. Francis Delannay Dean, Louvain School of Engineering UCL
 Prof Luis Rodrigues, Chairman of Department	 Prof. Marc Lobelle, Vice Dean, UCL Cluster Dual Masters coordinator
	 Prof. Kim mens, Chairman, programmes commission in Computer Engineering and Computer Science

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<b>FIRST YEAR STUDIES</b>	
<b>IST</b> : prerequisite for UCL students: having studied by oneself a textbook on computer networks, such as "Computer networking " by Kurose & Ross.	<b>UCL</b>
<b><u>Autumn Semester (minimum of 30 ECTS)</u></b>	
Mobile Communications Networks (7.5 ECTS)	LINGI2141 Computer networks : information transfer (6 ECTS)
Network and Computer Security (7.5 ECTS)	LINGI2261 Artificial intelligence (6 ECTS)
Independent Studies III (1,5 ECTS)	LINGI2255 or LSINF2255 Software engineering project (6 ECTS)
1 course in the following list: <ul style="list-style-type: none"> <li>Artificial intelligence (7.5 ECTS)</li> <li>Peer-to-Peer Systems and Overlay Networks (7.5 ECTS)</li> <li>Mechanims for Quality of Service in the Internet (7.5 ECTS)</li> </ul>	1 course in the following list: <ul style="list-style-type: none"> <li>LTECO2300 - Questions de sciences religieuses : questions d'ethique (2 ECTS)</li> <li>LELEC2920A Communication networks (2 ECTS)</li> </ul>
1 course in the following list: <ul style="list-style-type: none"> <li>Technology of Communication Networks (6.0 ECTS)</li> <li>Computer networks (6.0 ECTS)</li> </ul>	2 courses in the following list: <ul style="list-style-type: none"> <li>LINGI2143 Concurrent systems: models and analysis (5 ECTS)</li> <li>LINGI2144 Secured systems engineering (5 ECTS)</li> <li>LINGI2346 Distributed application design (5 ECTS)</li> <li>LMAT2450 Cryptography (5 ECTS)</li> </ul>
<b><u>Spring Semester (minimum of 30 ECTS)</u></b>	
Middleware for Distributed Internet Applications (7.5 ECTS)	LINGI2142 Computer networks : Configuration and management (5 ECTS)
Audio and Video Communications (6.0 ECTS)	
Independent Studies IV (1,5 ECTS)	LINGI2347 Computer Systems security (5 ECTS)
Applications and Implementations of Cryptographic Algorithms (7.5 ECTS)	3 courses in the following list: <ul style="list-style-type: none"> <li>LINGI2132 Languages and translators (6 ECTS)</li> <li>LINGI2348 Information theory and coding (5 ECTS)</li> <li>LSINF2345 Languages and algorithms for distributed applications (5 ECTS)</li> <li>LINGI2315 Design of embedded and real-time systems (5 ECTS)</li> </ul>
1 course in the following list: <ul style="list-style-type: none"> <li>Mobile Computing (7.5 ECTS)</li> <li>Wireless sensor networks (7.5 ECTS)</li> <li>Software for embedded systems (7.5 ECTS)</li> <li>Network management adn optimization (7.5 ECTS)</li> <li>Network project and planning (7.5 ECTS)</li> </ul>	1 elective course in the UCL programs to reach at least 30 ECTS for the semester (e.g. language course, management course, computer science course or seminar)

## Notes:

- Students who had a course equivalent to one of the courses of the programme in their bachelor program must replace it with an elective course
- The course "Languages and algorithms for distributed applications" includes peer-to-peer networking.
- Students holding a bachelor from UCL must follow the LTECO2300 and LING2132 courses.
- Students have to follow one Artificial intelligence course either at IST or at UCL.

<b>SECOND YEAR STUDIES</b>	
<b>UCL</b>	<b>IST</b>
<b><u>Autumn Semester (minimum of 30 ECTS)</u></b>	
LINGI2143 Concurrent systems : models and analysis (5 ECTS)	Mobile Communications Networks (7.5 ECTS))
LINGI2255 or LSINF2255 Software engineering project (6 ECTS)	Technology of Communication Networks (6.0 ECTS)
2 courses in the following list: <ul style="list-style-type: none"> <li>• LINGI2143 Concurrent systems: models and analysis (5 ECTS)</li> <li>• LINGI2144 Secured systems engineering (5 ECTS)</li> <li>• LINGI2346 Distributed application design (5 ECTS)</li> <li>• LMAT2450 Cryptography (5 ECTS)</li> <li>• LINGI2261 Artificial intelligence (6 ECTS)</li> </ul>	2 courses in the following list: <ul style="list-style-type: none"> <li>• Peer-to-Peer Systems and Overlay Networks (7.5 ECTS)</li> <li>• Cloud Computing (7.5 ECTS)</li> <li>• Mechanims for Quality of Service in the Internet (7.5 ECTS)</li> </ul>
courses in the following list to reach at least 4 ECTS <ul style="list-style-type: none"> <li>• LTECO2300 Questions de sciences religieuses : questions d'éthique (2 ECTS)</li> <li>• LELEC2920A Communication networks (2 ECTS)</li> <li>• 1 elective course in the UCL programs (e.g. language course, management course, computer science course or seminar)</li> </ul>	Independent Studies III (1.5 ECTS)
Thesis work (5 ECTS)	
<b><u>Spring Semester (minimum of 30 ECTS)</u></b>	
1 course in the following list: <ul style="list-style-type: none"> <li>• LINGI2132 Languages and translators (6)</li> <li>• LINGI2348 Information theory and coding (5)</li> <li>• LSINF2345 Languages and algorithms for distributed applications (5)</li> <li>• LINGI2315 Design of embedded and real-time systems (5)</li> </ul>	Thesis work (30 ECTS)
Thesis work (25 ECTS)	

**Notes:**

1. Thesis related activities are supervised by both partners
2. In UCL, work on the thesis may be spread over the whole second year and 30 ECTS is, for legal reasons, 28 ECTS for the thesis and 2 ECTS for a related seminar.



**UCL**  
Université  
catholique  
de Louvain

- Important
- Confidentiel
- Urgent

De la part de

*Professor Marc Lobelle*  
*UCL - ICTEAM - INGI*

Transmis à

*Profesor Luis Rodrigues*  
*IST*

Nous avons le plaisir de vous envoyer  
le(s) document(s) ci-joint(s) :

- à votre demande
- en communication, prière de restituer
- pour information
- pour examen
- à discuter en réunion
- pour suite utile
- pour signature
- pour avis
- pour éléments de réponse à me fournir
- en retour, merci
- pour approbation, à retourner

Remarques

*Please sign the 2 documents and send  
1 back to Mr Lobelle.*

Date et signature

*22/10/2012* *Anachel.*