

# Double Master's Degree Cooperation Agreement

between

College of Electronics and Information Engineering  
of  
Tongji University  
Shanghai, China

and

E.T.S. Ingeniería y Sistemas de Telecomunicación  
of  
Technical University of Madrid  
Madrid, Spain

regarding

**DOUBLE MASTER's DEGREE PROGRAM**

On the basis of the graduate regulations of Tongji University and the graduate regulations of Technical University of Madrid.

- Tongji University, hereafter referred to as Tongji, hereby duly represented by its President, located at 1239 Siping Road, Shanghai, 200092, P.R. CHINA, and
- Technical University of Madrid (Universidad Politécnica de Madrid, in Spanish), hereafter referred to as UPM, hereby duly represented by its President, domiciled at C/Ramiro de Maeztu, 7, 28040, Madrid, SPAIN.

The aforementioned parties are jointly referred to as “the parties” and hereby agree to the following regulations concerning the awarding of a Double Master’s Degree.

## **SECTION I – PURPOSE OF THE AGREEMENT**

Tongji and UPM will promote the exchange of students with the result of awarding a Double Master’s Degree, hereafter referred to as DMD, from both universities.

## **SECTION II – ADMINISTRATIVE ISSUES**

### **2.1 Area of study and student flow**

The DMD program within the framework of this Agreement is valid exclusively for the following Master’s Programs, hereafter referred to as MPs:

- MP offered at Tongji:
  - DISCIPLINE CODE: 081000
  - DISCIPLINE NAME: Information and Communication Engineering
- MP offered at UPM:
  - DISCIPLINE NAME: Systems and Services Engineering for the Information Society

Each university will receive a maximum of 5 incoming students per year in total, and both parties will try to maintain a balanced number of students each year.

### **2.2 Applications, Selection, Nomination and Admission of Students**

1. Each university will establish its own application and selection process. An admissions team at the home university will select students during the first semester of their first year master’s studies.

2. All documentation from the selected students will be collected by the administrative coordinator for student exchange at each university, who will send the documents, together with

a list of nominated students, to the corresponding university before end of the first semester, in case of UPM, and end of the second semester, in case of Tongji.

3. Every host university will review the documents from the nominated students for their admission.

4. Students are selected and admitted to the program according to their academic results, prerequisite requirements and motivations.

5. All students must be enrolled in the DMD program on a full-time basis.

6. Official notification on admission will only be through direct contact between the administrative coordinators, who will send a list of admitted students to each other and issue admission letters to each individual student participating in the DMD Program.

7. The documentation sent to each university will include the learning agreement describing the courses that individual students will take at home university as well as courses they have to take at host university in order to guarantee that the rules, regulations and other requirements for the Master's Degree are followed and fulfilled.

## **2.3 Documentation and Deadlines**

1. All students must fulfil the requirements for admission to the MP listed above, having all documents to be written in English. The administrative coordinators should exchange information about the required documents in advance before sending application papers to each other.

2. It is essential that all students will present proof of certificates, transcripts and other necessary documents, which are required by the host university as required for application and admission.

3. The academic coordinators at both universities will make the final decision for the admission of students participating in the DMD program.

## **2.4 Rights and Status of the students**

1. Students participating under this Agreement will be enrolled as degree seeking students, so they will have the same rights and obligations as degree seeking students in the respective universities.

2. Students participating in the program will be entitled to participate in any introductory programs that are customarily arranged for international students at host universities.

3. Both universities will assist in finding accommodation for students participating in the DMD program.

## **2.5 Financial Considerations**

1. Students from both universities will pay for their own expenses connected with travelling abroad (i.e. passport, visa and international transportation costs), health insurance, accommodation and other living costs.
2. Additional charges, including any for social services or student union fees, depend on the regulations of host universities.
3. No tuition fees will be paid to the host university during the period that students are actively participating in the DMD program.

## **2.6 Insurance**

Students will take all necessary steps to arrange for health insurance, insurance coverage against physical injuries and civil liability while performing their research duties at the universities involved, in pursuance of the rules and regulations that apply within the concerned universities and in compliance with national statutory regulations as applicable.

## **SECTION III – STUDY CURRICULA, SUPERVISION AND EXAMINATION**

1. Once UPM students finish the first semester at home university, they will be entitled to continue their curriculum for at least a second semester at Tongji.
2. On the other hand, once Tongji students finish the first two semesters at home university, they will be entitled to continue their curriculum for at least two semesters more at UPM.
3. Courses, both compulsory and elective, examinations, and final dissertation will be fully recognised by both universities. Particular cases will be treated individually.
4. Course syllabus will be made available to both parties.
5. The distribution of courses and final Master thesis for all students participating in the DMD programme is shown in the Study Plan in Appendixes A and B at the end of this Agreement.
6. Official teaching language of this DMD is English.
7. All students will produce a final dissertation in English that will be co-supervised by teachers from both universities and presented at any of both partner universities. In order to be qualified for the Tongji degree, Tongji students will write a version of their Mater thesis in Chinese.

## **SECTION IV – AWARDING OF DIPLOMA**

1. The Study Plan in Appendixes A and B includes all compulsory courses to be taken at home university or replaced by equivalent courses as described in Appendix D, at host university, as well as semi-compulsory, elective and recommended courses.

2. In order to obtain both Diploma of the MP, the candidate must be author or co-author of, at least, one scientific publication related to the Master's thesis.
3. Both universities will provide transcripts of records for incoming students and send them directly to the home university.
4. It is the responsibility of the academic coordinators to guarantee that the rules, regulations and other requirements for the Master's Degree are followed and fulfilled.
5. After successful completion of the complete program at both universities, the students receive the degrees of both universities. Master of Science in ENGINEERING is to be drawn up by Tongji, and Master in SYSTEMS AND SERVICES ENGINEERING FOR THE INFORMATION SOCIETY is to be drawn up by UPM.

## **SECTION V – CONTACT PERSON**

The signatories appoint PROF. Aihuang Guo from Tongji and PROF. César Sanz Alvaro from UPM as program Directors, and DR. Chao Wang from Tongji and PROF. César Benavente Peces from UPM as academic coordinators for the purpose of this DMD program. They have the responsibility of guiding the students through the corresponding MP. They are also responsible for the annual evaluation of this Agreement as well as to purpose further actions.

## **SECTION VI: TERMS OF AGREEMENT**

1. The present Agreement will come into effect as soon as the authorities of both universities sign it. It will remain in effect for 5 years, renewable in writing by mutual consent and by drafting a new document.
2. Each university may terminate this Agreement before its expiration, provided that a written notice of the intent is given to the other party at least 6 months prior to termination. Commitments already in progress shall be fulfilled and students enlisted in the program will at that time be allowed to complete it.
3. Amendments or changes to this Agreement shall be made in writing and signed by the duly authorised representatives of the universities.

The agreement is signed in 4 copies, with equal validity.

PROF. Dr. PEI Gang  
Tongji University



PLACE AND DATE

PROF. Dr. Carlos CONDE LÁZARO  
Universidad Politécnica de Madrid



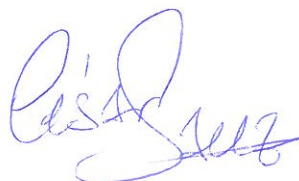
PLACE AND DATE

PROF. Dr. CHEN Qijun  
Dean of College of Electronics and  
Information Engineering



PLACE AND DATE

PROF. Dr. César SANZ ÁLVARO  
Director of School of Telecommunication  
Systems Engineering



PLACE AND DATE

**APPENDIX A: STUDY PLAN FOR THE DOUBLE MASTER'S DEGREE  
UPM STUDENTS**

YEAR 1		YEAR 2	
Semester 1 at UPM	Semester 2 at Tongji	Semester 3 at UPM/Tongji	Semester 4 at UPM
<u>Choose 30 ECTS among next elective courses:</u>  ICT Management in the Organization (2 ECTS/ 1 TC)  ICTs and Information Society (3 ECTS/ 1 TC)  Data Modeling and Analysis in Engineering (5 ECTS / 3 TC)	<u>Mandatory Courses:</u>  Chinese Language (3 TC)  Chinese Language and Culture (3 TC)  Code of Academic Integrity (1 TC)  Thesis Proposal (1 TC)	<u>Mandatory Activities:</u>  Paper Writing and Publication (5 ECTS/ 2 TC)  Research Advanced Seminars (5 ECTS / 2 TC)	<u>Mandatory Activities:</u>  Master Thesis (15 ECTS)
Wireless Communications (5 ECTS/ 2 TC)  Advanced Digital Architectures (5 ECTS/ 2 TC)  Audio and Video Signal Processing (5 ECTS/ 2 TC)  Ubiquitous and Secure Networks and Services (5 ECTS/ 2 TC)  Advanced Research Seminars I	<u>Choose 10 TC (Tongji Credits) among next:</u>  Digital Signal Processing (3 TC)  Fundamentals of Wireless Communications (3 TC)  Advanced Engineering Electromagnetics (2 TC)  Propagation Channel Characterization, Parameter	Students will join a research group and will start their research activities	<u>Choose 10 ECTS among next:</u>  Signal Processing Techniques for Communications (5 ECTS/ 2 TC)  RF Electronic Design (5 ECTS/ 2 TC)  Advanced Virtual Instrumentation Systems (5 ECTS/ 2 TC)

(5 ECTS/ 2 TC)	Estimation and Modelling (2 TC)  Modern Signal Processing (2 TC)  Mathematical Foundations for Computer Science (4 TC)		Embedded Systems (5 ECTS/ 2 TC)  Signal Recognition Techniques (5 ECTS/ 2 TC)  Advanced Audiovisual Coding (5 ECTS/ 2 TC)  Telematics Services for the Information Society (5 ECTS/ 2 TC)  Services and Protocols Engineering (5 ECTS/ 2 TC)  Advanced Research Seminars II (5 ECTS/ 2 TC)
<b>Total: 30 ECTS</b>	<b>Total: 18 TC</b>	<b>Total: 10 ECTS / 4 TC</b>	<b>Total: 25 ECTS</b>

Remark:

- Each UPM student must take 28 TC in this DMD. 22 TC are taken at Tongji in Semester 2 and Semester 3. The remaining 6 TC can be recognized by courses taken at UPM. The equivalence between Tongji and UPM subjects and credits is specified above in Semester 1 and Semester 4.
- The matching between the above courses provided by Tongji and the Curriculum specified by the Education Plan of Master Program in Information and Communication Engineering at Tongji University (Appendix C) is listed as follows:
  - Digital Signal Processing: matching Stochastic Digital Signal Processing (2080317)
  - Fundamentals of Wireless Communications: matching Broadband Wireless Communication (2080321) and Error Correction Encoding Theory (2080322)



- Advanced Engineering Electromagnetics: matching RF Circuit Design (2080139) and All-optical Communication Technology (2080327)
- Propagation Channel Characterization, Parameter Estimation and Modelling: matching Broadband Wireless Communication (2080321)
- Modern Signal Processing: matching Signal Processing Technology and Application (2080330)
- Mathematical Foundations for Computer Science: matching Communication Networks: Architecture and Protocols (2080320)

**APPENDIX B: STUDY PLAN FOR THE DOUBLE MASTER'S DEGREE  
TONGJI STUDENTS**

YEAR 1		YEAR 2		YEAR 3	
Semester 1 at Tongji	Semester 2 at Tongji	Semester 3 at UPM	Semester 4 at UPM	Semester 5 at Tongji	Semester 6 at Tongji
<u>Mandatory Courses:</u>  Code of Academic Integrity (1 TC)	<u>Mandatory Courses:</u>  Thesis Proposal (1 TC)	<u>Choose 5 ECTS among next</u>  ICT Management in the Organization (2 ECTS)	<u>Mandatory activities:</u>  Paper Writing and Publication (5 ECTS)	<u>Mandatory activities:</u>  Master Thesis	
<u>Choose 3 TC (Tongji Credits) among the Common Courses listed in Appendix C</u>  <u>Choose 6 TC among the Degree Courses listed in Appendix C</u>  <u>Choose 4 TC among the Non-degree Courses listed in Appendix C</u>	<u>Choose 3 TC (Tongji Credits) among the Common Courses listed in Appendix C</u>  <u>Choose 6 TC among the Degree Courses listed in Appendix C</u>  <u>Choose 4 TC among the Non-degree Courses listed in Appendix C</u>	ICTs and Information Society (3 ECTS)  Data Modeling and Analysis in Engineering (5 ECTS)  <u>Choose 10 ECTS among next:</u>  Wireless Communications (5 ECTS)  Advanced Digital Architectures (5 ECTS)	<u>Elective courses (15 ECTS):</u>  Signal Processing Techniques for Communications (5 ECTS)  RF Electronic Design (5 ECTS)  Advanced Virtual Instrumentation Systems (5 ECTS)  Embedded Systems (5 ECTS)		

		<p>Audio and Video Signal Processing (5 ECTS)</p> <p>Ubiquitous and Secure Networks and Services (5 ECTS)</p> <p>Advanced Research Seminars I (5 ECTS)</p>	<p>Signal Recognition Techniques (5 ECTS)</p> <p>Advanced Audiovisual Coding (5 ECTS)</p> <p>Telematics Services for the Information Society (5 ECTS)</p> <p>Services and Protocols Engineering (5 ECTS)</p> <p>Advanced Research Seminars II (5 ECTS)</p>		
<b>Total: 14 TC</b>	<b>Total: 14 TC</b>	<b>Total: 15 ECTS</b>	<b>Total: 20 ECTS</b>		

**APPENDIX C: CURRICULUM OF THE EDUCATION PLAN OF MASTER PROGRAM IN INFORMATION  
AND COMMUNICATION ENGINEERING AT TONGJI UNIVERSITY**

Course Type	Course Number	Course Name	College	Credits	Hours
Common Courses	2070100	Chinese Language Course		3	108
	2090001	First Foreign Language(English)	College of Foreign Languages	3	108
	2090002	First Foreign Language(Russian)	College of Foreign Languages	3	108
	2090003	First Foreign Language(French)	College of Foreign Languages	3	108
	2090004	First Foreign Language(Japanese)	College of Foreign Languages	3	108
	2090005	First Foreign Language(German)	College of Foreign Languages	3	108
	2090044	First Foreign Language(French)	College of Foreign Languages	3	780
	2260005	Research on the Theory and Practice of Socialism with Chinese Characteristics	Marxism School	2	36
	2260006	Introduction to Dialectics of Nature	Marxism School	1	18
	2900006	A General View of China		3	54
Degree Courses	2080317	Stochastic Digital Signal Processing	College of Electronics and Information Engineering	2	36
	2080320	Communication Networks: Architecture and Protocols	College of Electronics and Information Engineering	2	36
	2080321	Broadband Wireless Communication	College of Electronics and Information Engineering	2	36
	2080322	Error Correction Encoding Theory	College of Electronics and Information Engineering	2	36
	2080323	Symposium on Information and Communication Engineering	College of Electronics and Information Engineering	1	18
	2080360	Social Practice	College of Electronics and Information Engineering	2	36
	2080419	Major Practice and Innovation	College of Electronics and Information Engineering	2	36
	2080420	Academic Discussion and Communication	College of Electronics and Information Engineering	2	36
Non-degree Courses	2080138	Advanced Operations Research	College of Electronics and Information Engineering	2	36
	2080139	RF Circuit Design	College of Electronics and Information Engineering	2	36
	2080327	All-optical Communication Technology	College of Electronics and Information Engineering	2	36
	2080330	Signal Processing Technology and Application	College of Electronics and Information Engineering	2	36
	2080333	Train Control Theory Based on Communication	College of Electronics and Information Engineering	2	36

<u>Compulsory Courses</u>	2080416	Introduction of Communication and Information Processing for Internet of Vehicles	College of Electronics and Information Engineering	2	36
	2102002	Numerical Analysis	Department of Mathematics	3	54
	2102003	Stochastic Process	Department of Mathematics	3	54
	2900002	Thesis Proposal		1	0
	2900011	Code of Academic Integrity		1	0

## APPENDIX D: SUBJECTS EQUIVALENCE AND RECOGNITION<sup>i</sup>

Tongji courses	TC <sup>ii</sup>	ECTS <sup>iii</sup>	UPM courses
Communication Networks: Architecture and Protocols	2	5	Services and Protocols Engineering
Broadband Wireless Communication	2	5	Wireless Communications
RF Circuit Design	2	5	RF Electronic Design
Signal Processing Technology and Application	2	5	Signal Processing Techniques for Communications
Numerical Analysis	3	5	Data Modeling and Analysis in Engineering
Stochastic Digital Signal Processing	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Error Correction Encoding Theory	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Symposium on Information and Communication Engineering	1	5	Research Advanced Seminars I/II <sup>iv</sup>
Social Practice	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Major Practice and Innovation	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Academic Discussion and Communication	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Advanced Operations Research	2	5	Research Advanced Seminars I/II <sup>iv</sup>
All-optical Communication Technology	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Train Control Theory Based on Communication	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Introduction of Communication and Information Processing for Internet of Vehicles	2	5	Research Advanced Seminars I/II <sup>iv</sup>
Stochastic Process	2	5	Research Advanced Seminars I/II <sup>iv</sup>

<sup>i</sup> The Tongji students must take at least 20 ECTS at UPM.

<sup>ii</sup> TC: Tongji Credits

<sup>iii</sup> ECTS: European Credit Transfer System

<sup>iv</sup> A set of two of the courses taken at Tongji (on the left side) will be equivalent to "Research Advanced Seminars I" (5 ECTS elective credits in semester 3) and "Research Advanced Seminars II" (5 ECTS elective credits in semester 4) at UPM.