

## Appendix A

### Dual Degree Agreement between

### Instituto Superior Técnico (IST) and Politecnico di Torino (Polito)

### Master of Science In Aerospace Engineering

**Duration: Academic Year 12/13 to 16/17**

Degree programme at IST:	<b>Mestrado em Engenharia Aeroespacial (MEAer)</b> (120 ECTS)
Degree awarded:	M.Sc.
Language of instruction	English
Entrance admission criteria:	Bachelor of Science / Laurea in Aerospace Engineering having been awarded a Bachelor Degree, being enrolled in the Master of Science programme in Aerospace Engineering at Instituto Superior Técnico and having accumulated at least 60 ECTS in the programme
Degree programme at PoliTO:	<b>Ingegneria Aerospaziale (IASP)</b> (120 ECTS)
Degree awarded:	Laurea Magistrale (MSc - 2 years)
Language of instruction	Italian
Entrance admission criteria:	Bachelor of Science / Laurea in Aerospace Engineering having been awarded a Bachelor Degree, being enrolled in the Master of Science programme in Aerospace Engineering at Politecnico di Torino and having accumulated at least 60 ECTS in the programme.
Number of students	2

## Schematic Study Plan

Option 1: for students starting their MSc at IST			
Year	Institution	Studies	Remarks
1	IST	Compulsory and elective courses	60 ECTS
2	PoliTO	Courses + Master Thesis (co-supervised)	30+30 ECTS
Option 2 : for students starting their MSc at PoliTO			
Year	Institution	Studies	Remarks
1	PoliTO	Compulsory and elective courses	60 ECTS
2	IST	Courses + Master Thesis (co-supervised)	30+30 ECTS
<b>The detailed study plan must be defined by the academic coordinators for each student.</b>			

## Study Program

FIRST YEAR STUDIES	
IST	PoliTO
<u>Autumn Semester</u>	<u>Autumn Semester</u>
<b>Mandatory courses (18 ECTS):</b>	<b>Mandatory courses (24 ECTS):</b>
Solid Mechanics, 6 ECTS	02BAQMT, Gasdynamics, 8 ECTS
Heat Transfer, 6 ECTS	02EUGMT, Flight mechanics, 8 ECTS
Computational Mechanics, 6 ECTS	02IHZMT, Numerical methods and scientific computing, 8 ECTS
<b>Elective courses (min 12 ECTS) from:</b>	
Thermodynamics II, 6 ECTS	
Vibrations and Noise, 6 ECTS	
Helicopters, 6 ECTS	
Coupled Phenomena, 6 ECTS	
Sensors and Systems, 6 ECTS	
Emissions, 6 ECTS	
<u>Spring Semester</u>	<u>Spring Semester</u>
<b>Mandatory courses (18 ECTS):</b>	<b>Mandatory courses (24 ECTS):</b>
Project Management, 6 ECTS	02BUJMT, Jet propulsion, 8 ECTS
Fundamental Course in Mechanical Processing of Materials, 6 ECTS	03GKZMT, Aerospace systems, 8 ECTS
Propulsion, 6 ECTS	02CODMT, Aircraft structures, 8 ECTS
<b>Elective courses (min 12 ECTS):</b>	
Aerodynamics II, 6 ECTS	<b>Elective courses (min 12 ECTS) from the list in Appendix B.</b>  These courses can be attended either during the 1 <sup>st</sup> or the 2 <sup>nd</sup> study year.
Structural Mechanics, 6 ECTS	
Aeroacoustics, 6 ECTS	
Space Environment, 6 ECTS	
Air Traffic Management, 6 ECTS	
Maintenance and Safety, 6 ECTS	

SECOND YEAR STUDIES	
IST	Polito
<p><b><u>Students must obtain a minimum of 60 ECTS as follows:</u></b></p> <ul style="list-style-type: none"> <li>- A 30ECTS thesis done in co-supervision</li> <li>- Courses that may be taken either in the autumn or spring Semesters.</li> </ul>	
<b><u>Autumn Semester</u></b>	<b><u>Autumn Semester</u></b>
<b>Mandatory courses (18 ECTS):</b>	<b>Mandatory courses (16 ECTS):</b>
Aerospace Design, 6 ECTS	02NHSMT, Design of aerospace vehicles, 8 ECTS
Laminated Composite Materials, 6 ECTS	01AAJMT, Aeroelasticity, 8 ECTS
Aerospace Structures, 6 ECTS	
<b>Elective courses (min 12 ECTS):</b>	<b>Elective courses (min 14 ECTS) from the list in Appendix B</b>  These courses can be attended either during the Autumn or the Spring semester.
Computational Fluid Dynamics, 6 ECTS	
Mechanical Behaviour of Materials, 6 ECTS	
Integrated Avionic Systems, 6 ECTS	
Air Traffic Control Systems, 6 ECTS	
Space Mission Analysis and Design, 6 ECTS	
<b><u>Spring Semester</u></b>	<b><u>Spring Semester</u></b>
<b>Master Thesis (30 ECTS) supervised by both partners</b>	
<b>These and other courses are chosen in accordance with student's mentor</b>	

**Note :**

1. The graduation thesis will have to be written in the local language or in English, under the supervision of one supervisor from the university of origin and one from the host university. The presentation of the Final project will take place at the host university preferably in front of the two supervisors or at least of one representative of the two universities. A video-conference connection can be allowed.
2. Upon the students request, he/she may discuss his/her thesis also in the university of origin.
3. Should changes occur on the above they will be immediately notified.



## Elective courses at Polito

Course Description available at :

[https://didattica.polito.it/pls/portal30/gap.a\\_mds.espani?p\\_a\\_acc=2011&p\\_id\\_cdl=&p\\_sdu=32&p\\_cds=26&p\\_header=&p\\_anno=0&p\\_info=&p\\_lang=EN](https://didattica.polito.it/pls/portal30/gap.a_mds.espani?p_a_acc=2011&p_id_cdl=&p_sdu=32&p_cds=26&p_header=&p_anno=0&p_info=&p_lang=EN)

### 1<sup>st</sup> year

Subjects of 1st year are mandatory for Polito students, and possible choices for IST students, provided timetable conflicts with the mandatory subjects of the 2nd year do not occur.

Academic Term	Code	Course	ECTS
1	02BAQMT	<a href="#">Gasdynamics</a>	8
1	02EUGMT	<a href="#">Flight mechanics</a>	8
1	02IHZMT	<a href="#">Numerical methods and scientific computing</a>	8
2	03BUJMT	<a href="#">Jet propulsion</a>	8
2	03GKZMT	<a href="#">Aerospace systems</a>	8
2	02CODMT	<a href="#">Aircraft structures</a>	8

### 2<sup>nd</sup> year

Academic Term	Code	Course	ECTS
1	01NHJMT	<a href="#">Structural dynamics of aerospace structures</a>	8
1	01NHMT	<a href="#">Numerical modeling and simulation techniques for aerospace structures</a>	8
2	01NHKMT	<a href="#">Aerospace structure testing</a>	6
2	03FKWMT	<a href="#">Aerospace manufacturing technology and processes</a>	6
1	01LKCMT	<a href="#">Jet Engine Mechanical Design</a>	8
1	01NHLMT	<a href="#">Project for aircraft engines</a>	8
2	02IITMT	<a href="#">Computational fluidodynamics of propulsive systems</a>	6
2	02AYLMT	<a href="#">Turbomachinery fluid dynamics</a>	6
1	01NHOMT	<a href="#">Guidance and control of the airplane</a>	8
1	01NZKMT	<a href="#">(it) Progetto dei sistemi aerospaziali integrati</a>	8
2	01NHPMT	<a href="#">Modeling, simulation and testing of aerospace systems</a>	6
2	02IIQMT	<a href="#">Flight simulation</a>	6
1	01NFMMT	<a href="#">Computational Fluid Dynamics</a>	8
1	03GDWMT	<a href="#">Turbulent flows</a>	8
2	04AAEMT	<a href="#">Aero-acoustics</a>	6
2	03AAHMT	<a href="#">Experimental aerodynamics</a>	6
1	01NZMMT	<a href="#">(it) Meccanica del volo spaziale</a>	8
1	02LNUMT	<a href="#">Space structures</a>	8
2	01NZLMT	<a href="#">(it) Progetto di missioni e sistemi spaziali</a>	6
2	01NZCMT	<a href="#">Space propulsion</a>	6
2	01NHMMT	<a href="#">Aerospace propulsion control</a>	6
2	01NHRMT	<a href="#">Materials for aerospace</a>	6
2	02BPIMT	<a href="#">Helicopter flight dynamics</a>	6

## Contacts

<i>IST</i>	<i>POLITO</i>
<i>Academic responsible for the programme</i> Prof. Luís Braga Campos (luis.campos@ist.utl.pt)	<i>Academic responsible for the programme</i> Prof. Gianfranco Chiocchia (gianfranco.chiocchio@polito.it)
<p>Contacts</p> <p><i>Academic:</i> Fernando Lau (lau@dem.ist.utl.pt)</p> <p><i>Administrative:</i> Sílvia Santos, International Office (silvia.santos@ist.utl.pt)</p>	<p><i>Administrative:</i> <u>International Relations</u> Elisa Armando (international.relations @polito.it)</p> <p><u>Incoming Students</u> Barbara Ballauri (<a href="mailto:incoming.students@polito.it">incoming.students@polito.it</a>)</p> <p><u>Outgoing students</u> Anna Solaro (mobilita.studenti@polito.it)</p>

## **Signatures**

Date: 7 <sup>th</sup> May 2012	Date: 6/11/2012
For Instituto Superior Técnico	For Politecnico di Torino
 Prof. Arlindo Oliveira President	 Prof. Marco Gilli Rector
 Prof. Luís Braga Campos Coordinator	 Prof. Gianfranco Chiocchia Coordinator