

# **AGREEMENT BETWEEN POLYTECHNIC OF BARI AND POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY TO ESTABLISH A COMMON “DOUBLE DEGREE” GRADUATE CURRICULUM IN MECHANICAL ENGINEERING “AUTOMAZIONE INDUSTRIALE E ROBOTICA – DYNAMIC SYSTEMS AND CONTROLS”**

The **Polytechnic of Bari**, represented by the President Prof. Nicola Costantino, via Amendola 126/b, 70126 Bari, Italy

**and**

The **Polytechnic Institute of New York University**, represented by the Provost E. Dianne Rekow, 6 MetroTech Center, Brooklyn, NY 11201,

**considering:**

1. the efforts to harmonize higher education and to establish international curricula that foster an international labour market and reinforce the competitiveness of Mechanical Engineering education as well as improve students mobility;
2. the demonstrated interest by the Polytechnic Institute of New York University to promote and initiate international curricula;
3. the DM 270/2004 (revision of the act 509/1999) of the Minister for Education, University, and Research, that allows Italian universities to independently develop their own curricula (according to the law 341 of the 19-11-1990, art.11);
4. the fact that the *Laurea Magistrale* Degree, of two year duration, is intended to further enhance students' training and background and that such degree can be administered in partnership with other Italian or foreign institutions;
5. that Polytechnic of Bari and the Polytechnic Institute of New York University have already successfully established high-quality joint curricula;
6. the existing collaboration and the interest to further develop educational and research activities between Polytechnic of Bari and Polytechnic Institute of New York University and the common objective to establish a double *Laurea Magistrale - Master of Science Degree in Mechanical Engineering with a specialization in “Automazione Industriale e Robotica – Dynamic Systems and Controls”*;

**and further accounting for:**

1. the common objective to offer international degree programs with standardized credit transfer procedures;

**establish the following:**

1. The introduction of a new graduate degree program (120 CFU for the Polytechnic of Bari and 30 credits for the Polytechnic Institute of New York University). Details of the curriculum and obligations of students and faculty involved in the program are presented in the attached executive plan of this agreement.
2. The students from Polytechnic of Bari will earn 63 CFU from the Polytechnic Institute of New York University (Table 1 and 3). The students from the Polytechnic Institute of New York University will earn 9 credits from Polytechnic of Bari (Table 1 and 2); the corresponding specific courses (table 2) to be taken at Polytechnic of Bari have to be approved by the advisor of the Polytechnic Institute of New York University prior to registration at Polytechnic of Bari.
3. The two Universities will provide the student two different diplomas (one from each partner institutions) as the student complies with all double degree requirements. The diploma from Polytechnic of Bari will show the academic title of “*Laurea Magistrale*” and the diploma released from the Polytechnic Institute of New York University will report the academic title of “*Master of Science*”.
4. Students are granted full access to both the institutions' facilities (such as Library, Laboratories, etc.) during their studies. Health insurance is regulated by the rules of each University.

5. Students from Polytechnic of Bari will be charged NYU-Poly's regular tuition and fees while studying at NYU-Poly and students from NYU-Poly will pay Polytechnic of Bari's tuition and fees while studying at Polytechnic of Bari. The students' tuition and fees will be covered by the students through fellowships or self support.

6. Access to the institutions' facilities is based on reciprocity criteria.

**Final regulations**

1. The present agreement is signed both in Italian and English languages. The agreement will be effective on the date of the last approval; it is valid for four years, but may be terminated by either party with six months written notice. If such termination is made, the program will be active until all students already enrolled in this double degree program complete their studies. The parties may also extend this agreement for any mutually agreed period of time.

2. The final regulations of this "Laurea Magistrale" for Polytechnic of Bari are approved by the Academic Senates. The final regulations of the "Master of Science" for the Polytechnic Institute of New York University are approved by its Graduate Curriculum and Standards Committee and its Faculty.

3. Resolution of conflicts is to be carried out through two arbitrates, each party selecting one arbitrate.

4. The two institutions establish a common intent to complete all the requested paperwork so that the "double degree" will be effective in the Fall Semester of the Academic Year 2011/2012. The Polytechnic Institute of New York University faculty approved this program on February 2 2011 and the Polytechnic of Bari approved this program on December 28 2010.

5. The two institutions agree on the contents of this agreement and sign it in two copies, one copy in Italian and one copy in English.

Polytechnic of Bari	Polytechnic Institute of New York University
<p>Bari, Italy,</p> <p style="text-align: right;">Il Rettore Prof. Nicola Costantino</p>	<p>Brooklyn, NY, USA,</p> <p style="text-align: right;">Provost E. Dianne REKOW</p>

# **EXECUTIVE DISPOSITIONS FOR A DOUBLE DEGREE BETWEEN POLYTECHNIC OF BARI AND POLYTECHNIC INSTITUTE OF NEW YORK UNIVERSITY**

The partner institutions allow the establishment of a double degree program, comprising of the “*Laurea Magistrale*” (Italian degree) in Mechanical Engineering at the Polytechnic of Bari and the Master of Science (US degree) in Mechanical Engineering at the Polytechnic Institute of New York University. Students complying with the degree requirements of both institutions will be granted a double degree.

## **1 – Executive and managing personnel**

1. The two partner institutions will appoint a program coordinator.
2. All the modifications or improvements in the double degree program are approved by the Academic Senates of the Polytechnic of Bari and by the Graduate Curriculum and Standards Committee and the Faculty of the Polytechnic Institute of New York University.
3. Student admission is separately conducted by each institution. The program coordinator of each Institution is responsible for student advising and continuous program administration.

## **2 – Admission requirements**

1. Students from Polytechnic of Bari must have a ‘Laurea’ degree in Mechanical Engineering or equivalent with a final grade higher than 100/110, a IBT TOEFL with a minimum grade of 79/120 and students from the Polytechnic Institute of New York University must be admitted as matriculated students to the graduate program in Mechanical Engineering.

## **3 – Language used for mutually transferred classes**

1. Courses transferred between the institutions will be taught in English.

## **4 – Procedure for the admission**

1. The admission procedures are regulated by each University.
2. Student selection is a responsibility of the Mechanical Engineering Committee for Polytechnic of Bari and the Mechanical and Aerospace Engineering Department of the Polytechnic Institute of New York University.

## **5 – Beginning and duration of the studies**

1. Student in the program can start in either the Fall (September) or Spring Term (January).  
The period abroad is expected to have a maximum duration of two semesters, excluding the Summer.

## **6 – Program content and structure**

1. The double degree has 120 CFUs for the Polytechnic of Bari Curriculum and 30 credits for the Polytechnic Institute of New York University Curriculum, as reported in Tables 1, 2, and 3.
2. Passing grade and exam policies are exclusively those of the local institution that offer the course.
3. The double degree curriculum is unique to this program.

## **7 – Transfer credits**

1. Transferring coursework between the partner institutions is possible through this program (see Tables 1÷3).
2. Courses transferred between the institutions must have minimum grades of B or equivalent (Table 4).
3. There will be no delay for the courses to be transferred, i.e., the courses can be transferred to the partner institution as soon as the grades in the granting institution are posted.

## **8 – Thesis and Thesis - committee**

1. Copy of the final project/thesis will be submitted to both institutions. The project/thesis has to be written in English and will be assessed by both institutions according to the local policies. The thesis should contain a summary in Italian whose length should not exceed ten pages or 20,000 characters. The project/thesis committee depends on the local institution.



Table 1 – General Framework of the Double Degree Program in Mechanical Engineering “Automazione Industriale e Robotica – Dynamic Systems and Controls”

Polytechnic of Bari			CFU		Polytechnic Institute of New York University 'Master of Science'	Credits
'Laurea Magistrale'						
1 <sup>st</sup> year	Student with a 4 year Bachelor Degree in Mechanical Engineering or equivalent	Transferred courses from 4 year Bachelor Degree to Polytechnic of Bari	30		Transferred courses from Polytechnic of Bari to the Polytechnic Institute of New York University	9
		Courses offered by the Polytechnic of Bari transferred to Polytechnic Institute of New York University	27			
	Student with a 3 year Laurea Degree	Courses offered by the Polytechnic of Bari		30		
		Courses offered by the Polytechnic of Bari transferred to Polytechnic Institute of New York University		27		
2 <sup>nd</sup> year	Student in the double degree Program	Courses offered by the Polytechnic Institute of New York University transferred to Polytechnic of Bari	45	45	Courses offered by the Polytechnic Institute of New York University and transferred to the Polytechnic of Bari	15
		Final project and laboratory at Polytechnic Institute of New York University transferred to Polytechnic of Bari (*)	18	18	Final project and laboratory at Polytechnic Institute of New York University transferred to Polytechnic of Bari (*)	6
<b>Total</b>			<b>120</b>	<b>120</b>	<b>Total</b>	<b>30</b>

(\*) Equivalent option: 1 course and 1 Research Project at the Polytechnic Institute of New York University

Table 2 – Double Degree Program in Mechanical Engineering “Automazione Industriale e Robotica – Dynamic Systems and Controls”

Courses for the students originally enrolled both at Polytechnic of Bari and at Polytechnic Institute of New York University. First year courses held at Polytechnic of Bari and recognized by Polytechnic Institute of New York University.

Courses at Polytechnic of Bari		Courses transferred to Polytechnic Institute of New York University	
Mechanics of Vibrating Systems (ING-IND/13)	6 CFU	Vibrations (ME 5443, ME course or equivalent)	3 credits
Robotics (ING-IND/13)	6 CFU	Sensor Based Robotics (ME 6613, ME course or equivalent)	3 credits
Optimization Methods (ING-IND/14)	6 CFU		
Analytical Dynamics (ING-IND/13)	9 CFU	Applied Mathematics in Mechanical Engineering (ME 6003, ME core course, or equivalent)	3 credits
Fluid Machinery II (ING-IND/08) and Energy Systems II (ING-IND/09)	12 CFU	Only for students enrolled at the Polytechnic of Bari: students are strongly encouraged to complete these courses prior to attending the second year at Polytechnic Institute of New York University.  Students with a 4 year Bachelor Degree in Mechanical Engineering or equivalent earn 30 CFU by the Polytechnic of Bari.	
Simulation and Prototyping (ING-IND/15)	6 CFU		
Applied Mechanics II (ING-IND/13)	6 CFU		
Machines and Electric Drives (ING-IND/32)	6 CFU		
Credits at Polytechnic of Bari	57 CFU	Total transferred credits from Polytechnic of Bari to Polytechnic Institute of New York University	9 credits

Table 3 – Courses of the Double Degree Program in Mechanical Engineering “Automazione Industriale e Robotica – Dynamic Systems and Controls”

Courses for the students originally enrolled both at Polytechnic of Bari and at Polytechnic Institute of New York University. Second year held at Polytechnic Institute of New York University and courses recognized by Polytechnic of Bari.

<b>ME core courses</b>		
ME 6703 Linear Control Theory and Design I ING-IND/13	3 credits	9 CFU
ME 6213 Introduction to solid mechanics ING-IND/14	3 credits	9 CFU
ME 6043 Transport phenomena ING-IND/08	3 credits	9 CFU
<b>Elective courses &amp; MS Research Project</b>		
<p>Choose two courses from the list below offered by the Polytechnic Institute of New York University during the 1st and/or 2nd semester. One course should be chosen from the Controls and Dynamic Systems specialty area (ING-IND/13 courses)-second digit equal to 6 or 7. Note that the course list is subjected to periodic improvements and updates by the Polytechnic Institute of New York University.</p>		
<p>ING-IND/08</p> <ul style="list-style-type: none"> <li>• ME 6013 Thermodynamics</li> <li>• ME 7063 Convective heat transfer</li> <li>• ME 7073 Conductive heat transfer</li> <li>• ME 7083 Radiative heat transfer</li> <li>• ME 7863 Engines and Machines</li> <li>• ME 8033 Combustion</li> <li>• ME 8043 Theory of propulsion</li> </ul> <p>ING-IND/13</p> <ul style="list-style-type: none"> <li>• ME 5653 Microeletromechanical systems</li> <li>• ME 5643 Mechatronics</li> <li>• ME 6603 Digital control system</li> <li>• ME 6713 Linear control theory and design II</li> <li>• ME 7613 Nonlinear systems</li> <li>• ME 7623 Cooperative control</li> <li>• ME 7703 Optimal robust control</li> </ul> <p>ING-IND/14</p> <ul style="list-style-type: none"> <li>• ME 7215 Elasticity I</li> <li>• ME 6223 Advanced mechanics of materials</li> <li>• ME 6253 Mechanics of nanomaterials</li> <li>• ME 7333 Non-destructive evaluation (NDE)</li> <li>• ME 7323 Failure mechanics</li> <li>• ME 7353 Fracture mechanics</li> <li>• ME 8213 Elasticity II</li> <li>• ME 8273 Mechanics of cellular materials</li> </ul> <p>ING-IND/16</p> <ul style="list-style-type: none"> <li>• ME 5243 Composite materials</li> <li>• ME 7243 Advanced composite materials</li> <li>• IE 7923 Product design for manufacturability</li> <li>• IE 7853 Computer Integrated Manufacturing Systems</li> </ul> <p>ING-IND/17</p> <ul style="list-style-type: none"> <li>• MN 7933 Environmental Health and Safety</li> <li>• IE 6193 Production Planning and Control</li> <li>• IE 6213 Facility Planning and Design</li> <li>• IE 7883 Manufacturing Systems Engineering</li> <li>• Other courses</li> </ul>	6 credits	18 CFU
ME9963 Master project in Controls and Dynamic Systems area	6 credits	18 CFU

Equivalent Option to the 6 credits project: 1 Course from the list above and 1 Research Project for 3 credits in the Controls and Dynamic Systems specialty area	6 credits	18 CFU
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<b>Polytechnic Institute of New York University</b>	<b>21 credits</b>
<b>Polytechnic of Bari – Total number of CFU transferred</b>	<b>Coursework: 45 CFU Final Project (or equivalent option): 18 CFU TOTAL: 63 CFU</b>

Table 4 – Double Degree Program in Mechanical Engineering “Automazione Industriale e Robotica – Dynamic Systems and Controls” courses.

Equivalence between Italian and American credit evaluation systems.

<b>Italian CFU</b>	<b>American credits</b>
30-30/30	A
28-29/30	A-
26-27/30	B+
24-25/30	B
22-23/30	B-
20-21/30	C+
18-19/30	C