



# Automation and Control Engineering MSc Programme

**Maria Prandini**

**Chair of the Automation and Control Engineering Program**

*October 8, 2019*



# POLIMI organization



# The Politecnico di Milano



**POLITECNICO**  
MILANO 1863

The logo originates from the design by Raphael "The School of Athens" kept in the Ambrosiana Art Gallery, Milan



Over **1.300** lecturers  
and **1.200** members of  
the administrative  
technical staff

**4** Schools

Over **42.000**  
students



**12**  
Departments

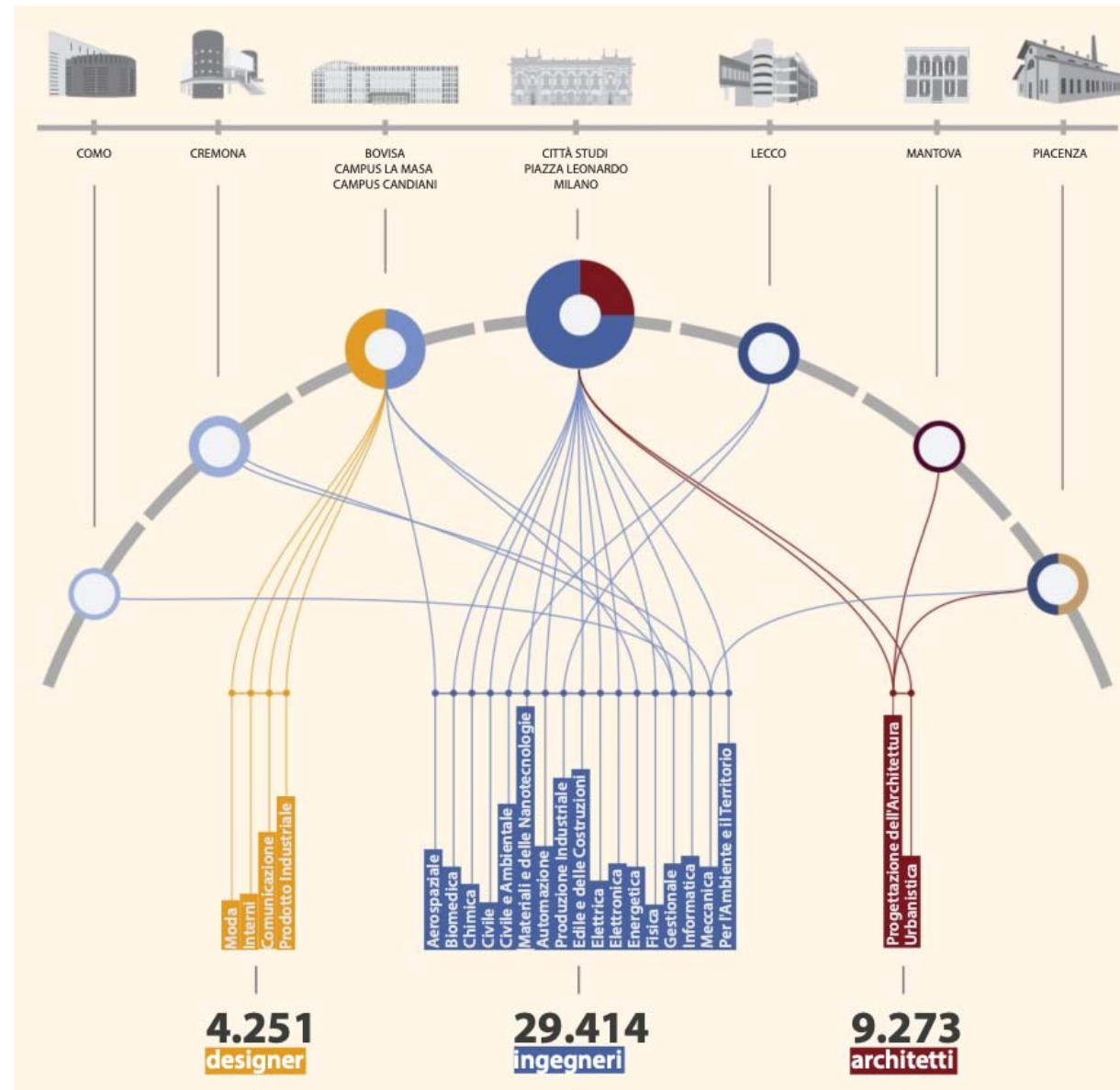
Ranked **no.1** in Italy,  
**no. 6** in Europe, **no. 16** in the world in the  
category «Engineering & Technology»  
QS World University Ranking 2019

**POLITECNICO MILANO 1863**

# Politecnico di Milano

## Campuses

- Milano Leonardo
- Milano Bovisa
- Como
- Cremona
- Lecco
- Mantova
- Piacenza





# Schools and Study Programmes



Each **Study Programme** (Bachelor and Master) is **associated to one of the 4 Schools**:

- Architecture Urban Planning Construction Engineering
- Design
- Civil, Environmental and Land Management Engineering
- Industrial and Information Engineering

The **Dean** is the head of the School and guides the teaching activities of all Study Programmes through the Council, Programme Boards, Student-Professor Joint Committee.

The **Student-Professor Joint Committee** monitors the Study Programmes performance and makes proposals for their improvement to the Dean and the Evaluation Unit.

Each Study Programme is led by a **Coordinator**, chairing the **Programme Board**, which plans and heads the teaching activities of the Study Programme.

# Automation and Control Engineering Study Program

The Master Programme in Automation and Control Engineering is within the Study Programme in **Automation and Control Engineering** of the **Industrial and Information Engineering (3I) School**.

## **Prof. Maria Prandini**

Coordinator of the Study  
Programme in Automation and  
Control Engineering



## **Prof. Antonio Capone**

Dean of the 3I School



The **Board of the Programme** is chaired by the coordinator and is composed of

- **professors** in charge of courses or teaching modules delivered as part of the Programme
- 7 elected **student representatives**

# Student Representatives – Automation and Control Engineering

Stefano Aversente



Brigida Brunacci



Daniele Di Francesco



Gloria Lopiano



Isabella Luppi



Lorenzo Petulicchio



Guido Sassaroli



# Student-Professor Joint Committee – 3I School

The Student-Professor Joint Committee is composed of 5 Professors and **5 Students**, who are the Student Representatives in the Council of the 3I School

Beatrice Bartolozzi



Giacomo Buratti



Antonella Polimeno Camastra



Laurens Lanzillo



Pietro Rossetti





# The role of the students



# The role of Students and their Representatives

- Students have the right to **participate in the life and governance of the University** through their Representatives. They are asked directly to express their opinion on the University.
- The **commitment of the Student Representatives** has allowed to achieve several positive results such as:
  - The reorganization of educational activities
  - Benefits of the «Right to Education» (including scholarships for low income students)
  - Exemptions to tuition fees for top students
- **Student Representatives** are **elected directly by you** every 2 years

**You do have the opportunity to influence with your ideas the University decision processes:**

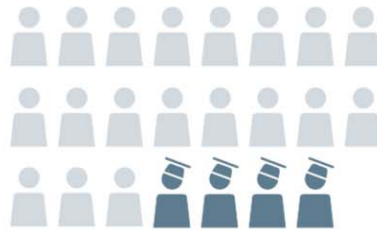
- **Get in contact with Student Representatives and tell them your suggestions**

# Student Representatives in the Central Bodies

## ACADEMIC SENATE

### 23 MEMBERS

- RECTOR;
- 12 DEPARTMENT REPRESENTATIVES;
- 4 PROFESSOR REPRESENTATIVES;
- 2 TECHNICAL-ADMINISTRATIVE STAFF REPRESENTATIVES;
- 4 STUDENT REPRESENTATIVES



### ROLE:

THE SENATE ADDRESSES AND PLANS THE DEVELOPMENT OF THE UNIVERSITY, WITH PARTICULAR ATTENTION TO EDUCATION AND RESEARCH, AND MONITORS THE WHOLE OPERATION OF THE INSTITUTION

THE ACADEMIC SENATE MEETS ONCE A MONTH

## BOARD OF GOVERNORS

### 11 MEMBERS

- RECTOR;
- 4 PROFESSOR REPRESENTATIVES;
- 1 TECHNICAL ADMINISTRATIVE STAFF REPRESENTATIVE;
- 3 EXTERNAL MEMBERS;
- 2 STUDENT REPRESENTATIVES



### ROLE:

THE BOARD OF GOVERNORS DEFINES THE LONG-TERM ECONOMIC PROGRAMME ON THE BASIS OF THE PROPOSALS AND OPINIONS OF THE ACADEMIC SENATE

THE CDA MEETS ONCE A MONTH



# Student Representatives in the School Bodies

## JOINT COMMITTEE

### 10 MEMBERS

- 5 PROFESSORS APPOINTED BY THE DEAN OF THE SCHOOL;
- 5 STUDENT REPRESENTATIVES;



### ROLE:

MONITORS THE PROVISION OF TRAINING, THE QUALITY OF TEACHING AND SERVICES OFFERED TO STUDENTS;

## SCHOOL BOARD

### MEMBERS

- DEAN OF THE SCHOOL;
- N. OF DIRECTORS OF CONNECTED DEPARTMENTS;
- N. PRESIDENTS OF THE CCS;
- 2/5 REPRESENTATIVES OF STUDENTS APPOINTED IN THE JOINT COMMITTEE

THE TOTAL NUMBER OF MEMBERS VARY FROM SCHOOL TO SCHOOL

### ROLE:

IT COORDINATES THE STUDY PROGRAMMES AND PROVIDES THE MAIN ORIENTATION TO THE SCHOOL

# Student Representatives in the Study Programme

## STUDY PROGRAMME BOARD – CCS

### MEMBERS

- PRESIDENT OF THE CSS;
- N. OF PROFESSORS OF THE CCS;
- **N. OF STUDENT REPRESENTATIVES**

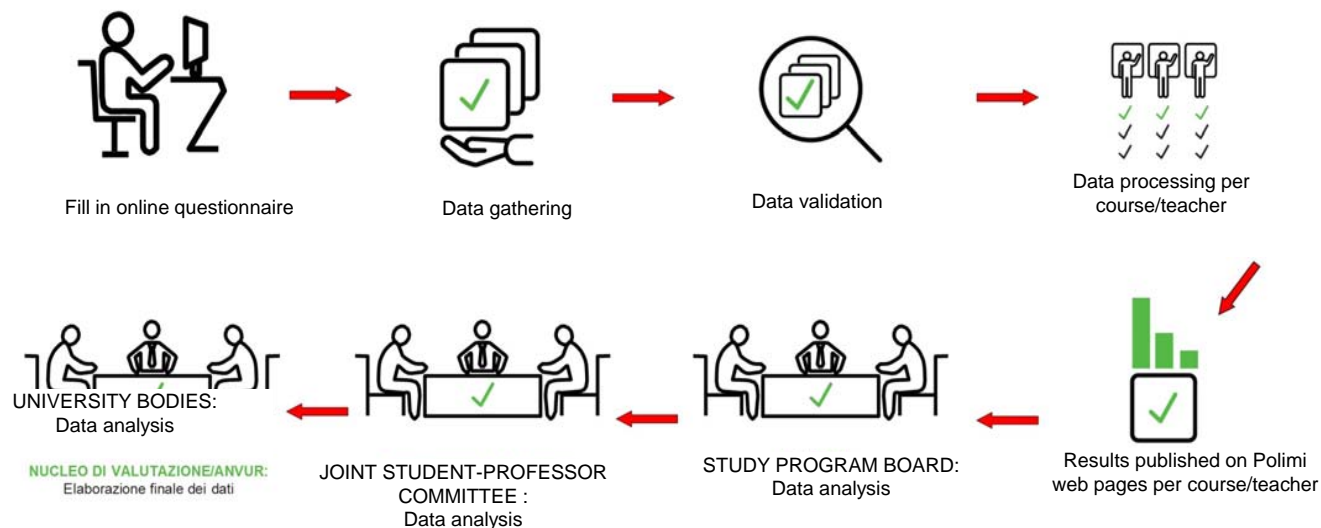
### ROLE:

IT DEFINES THE SUBJECTS OF THE STUDY PROGRAM-  
ME, THE TEACHING METHODS AND ITS USE, THE  
ANALYSIS OF THE EFFECTIVENESS OF THE COURSES  
CARRIED OUT, THE ORGANIZATION OF THE STUDY  
PLAN, THE ECTS DISTRIBUTION.

THE TOTAL NUMBER OF MEMBERS VARY  
FROM CCS TO CCS

# Opinions of the students on teaching

**Filling in an ANONYMOUS online questionnaire for each course is MANDATORY for enrollment in exams**



The questions concern:

- teaching
- teachers
- teaching assistant activities
- infrastructures

Since your opinions are highly considered, you are invited to:

- **Pay particular attention to the questionnaire compilation**
- **Give informed and consistent answers to the questions**
- **Provide proactive and constructive comments**



# Opinions of students enrolled in the last year

In the last year of the MSc Study Programme, we collect your opinion on:

→ **The whole training path**

Mandatory questionnaire for enrollment in the Final Degree Exam on:

Organization of teaching, specific contents, infrastructures, library, internships, international mobility, final exam.

→ **Student support services**

Anonymous and mandatory questionnaire for registration to the 1<sup>st</sup> exam of the year on:

Enrollment, Study plans, exam registration, taxes, student offices, ICT services, libraries, PoliPrint, catering, communication, physical environment.

# Services and Opportunities



# Student support services: whom to contact for ...

## Questions related to courses

1. Course teacher(s)
2. Study Programme Coordinator
3. Student Representatives
4. Joint Student-Professor Committee
5. Dean of the School
6. Ombudsman





# Student Representatives for Automation and Control Engineering

Stefano Aversente  
Brigida Brunacci  
Daniele Di Francesco  
Gloria Lopiano  
Isabella Luppi  
Lorenzo Petulicchio  
Guido Sassaroli

Email: [rappresentantistudenti-ccsautomazione@polimi.it](mailto:rappresentantistudenti-ccsautomazione@polimi.it)



# The Student Ombuds Office

Students who wish to complain about behavior that violates the university regulations and the rights and duties of students of POLIMI may contact the Ombudsman.

The Ombudsman acts after a non-anonymous complaint is made, carries out an adequate investigation into the matter and tries to solve it, protects the student against any reprisals, informs the complainant and the student representatives of the outcome of the inquiry.

Email: [difensoredeglistudenti@polimi.it](mailto:difensoredeglistudenti@polimi.it)

The Ombudsman is currently **Prof. Gerardus Janszen**.



# Student support services: whom to contact for ...

## Administrative matters

- Student Office  
desks, online chat, chatbot, email  
<https://www.polimi.it/en/current-students/contacts/>

## Organizational questions and study plans

- Reference persons of the study programme
- Dean's offices  
desks, chat, email  
<https://www.polimi.it/en/current-students/contacts/>
- Department student office





# Reference Rules

- **Educational rules** of the study program  
<https://www.polimi.it/en/programmes/>
- **Charter of the rights and duties of students**  
[http://www.normativa.polimi.it/?id\\_sottoc=66](http://www.normativa.polimi.it/?id_sottoc=66)
- **School Rules**  
<http://www.ingindinf.polimi.it/en/school/school-rules/>
- **Academic calendar and deadlines**  
<https://www.polimi.it/en/current-students/calendar-and-deadlines/deadlines/>



# Services and opportunities



**Career Service** – [www.careerservice.polimi.it/](http://www.careerservice.polimi.it/)

the service for connecting the job market and students and for supporting students in their first job search

**POLIHUB** – [www.polihub.it](http://www.polihub.it)

the startup District & Incubator that gives you opportunities for turning your ideas into a startup company

**Multi Chance Poli Team** – [www.polimi.it/en/footer/rights/disabilities-and-spld/](http://www.polimi.it/en/footer/rights/disabilities-and-spld/)

Service for Students with Disability and Learning Disabilities

**PoliPsi** – [www.polimi.it/en/services-and-opportunities/other-services-and-opportunities/support-and-listening-services/](http://www.polimi.it/en/services-and-opportunities/other-services-and-opportunities/support-and-listening-services/)

Counselling and Psychological and Psychotherapeutic Support Service for students

**Further services & opportunities** – [www.polimi.it/en/services-and-opportunities/](http://www.polimi.it/en/services-and-opportunities/)

scholarships, remunerated collaborations, associations and cultural activities, sport activities, libraries, lodging, dining



SCHOLARSHIPS AND  
FINANCIAL AID



STUDENTS  
REMUNERATED  
COLLABORATION  
ACTIVITIES



ASSOCIATIONS AND  
CULTURAL ACTIVITIES



LIBRARIES AND  
ELECTRONIC  
RESOURCES



RESIDENTIAL HALL



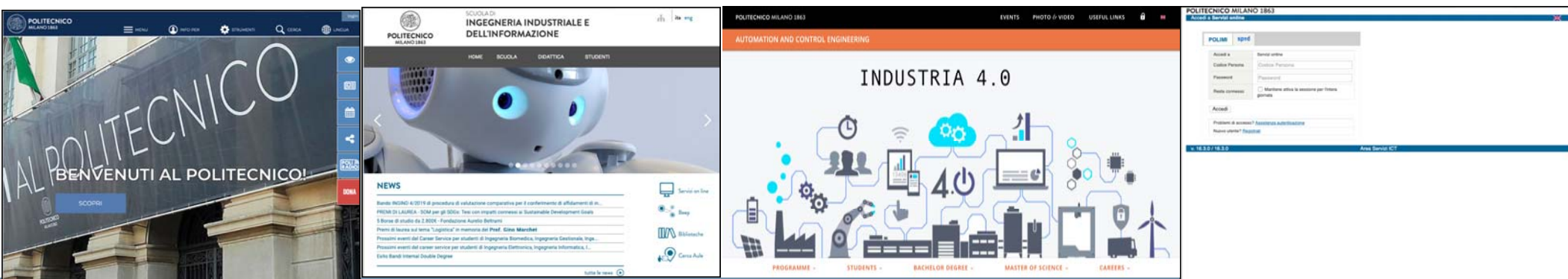
SPORTS



CANTEENS AND DINING OPTIONS

# Useful websites

- **POLIMI** [www.polimi.it](http://www.polimi.it) and, in particular, the section dedicated to students [www.polimi.it/en/current-students/](http://www.polimi.it/en/current-students/) for all information on university
- **School** [www.ingindinf.polimi.it](http://www.ingindinf.polimi.it) for more specific information on school, study programmes, teaching activities, graduation, special initiatives, etc.
- **Automation and Control Engineering** [www.ccsatm.polimi.it](http://www.ccsatm.polimi.it) for specific information on the programme and the members of the committees
- **Online POLIMI services** [www.polimi.it/servizionline](http://www.polimi.it/servizionline) your portal to all POLIMI administrative online tools



# Study Programme Committees @ <http://www.ccsatm.polimi.it>

POLITECNICO MILANO 1863

EVENTS

PHOTO & VIDEO

USEFUL LINKS



AUTOMATION AND CONTROL ENGINEERING

## INDUSTRIA 4.0



STUDY PLANS

GOING ABROAD

COMMITTEES

PROGRAMME ▾

STUDENTS ▾

BACHELOR DEGREE ▾

MASTER OF SCIENCE ▾

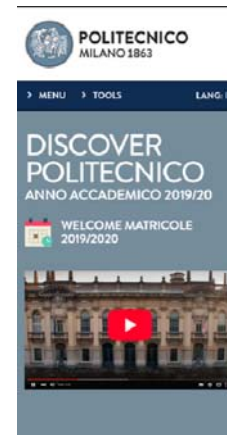
CAREERS ▾

[www.ccsatm.polimi.it/studenti/referenti-e-commissioni/?lang=en](http://www.ccsatm.polimi.it/studenti/referenti-e-commissioni/?lang=en)



# Apps, Newsletter, Social nets

- **APP DISCOVER POLIMI:** the mobile app for freshmen to discover all POLIMI services
- **APP POLIMI:** the mobile app for all students devoted to access to lecture timetables, manage study plan, request support to student office, etc.
- The biweekly newsletter **Politamtam**  
<http://www.politamtam.polimi.it/> for information on events, activities of student organizations, opportunities for students, and more
- Institutional **social channels:** [www.facebook.com/polimi](http://www.facebook.com/polimi)  
[www.youtube.com/polimi](http://www.youtube.com/polimi) [www.instagram.com/polimi](http://www.instagram.com/polimi)  
[www.twitter.com/polimi](http://www.twitter.com/polimi)  
[www.linkedin.com/school/polimi](http://www.linkedin.com/school/polimi) [www.polimi.it/itunes](http://www.polimi.it/itunes)



## SOCIAL



# Beep: a channel to support teaching and info exchange



LOGIN

BROCHURE

Have you forgotten your Person Code or password?  
To recover or create your credentials visit the: [Online Services page](#)

Beep Channel ●●●



How to access Beep



Are you a student?



Are you a professor and this is  
your first time in Beep?



Beep Channel

## Beep channel for a course

Teaching material and notes,  
student-teacher  
communications

## Beep channel of the Study Programme

Communications between study  
programme students, Student  
Representatives, and Coordinator

## Beep channel for International Mobility

Exchange of info on experiences  
of students within the  
International Mobility Program

<https://beep.metid.polimi.it/>

POLITECNICO MILANO 1863

# Announcement posted on the Beep Channel

[Home](#) [Documents](#) **FORUM** [Representative](#)

Forum

[Home forum](#) » [Information for the students](#) »

**LA DIGITALIZZAZIONE NELL'INDUSTRIA MANIFATTURIERA - SIEMENS ITALIA** [« Torna a Information for the students](#)

Discussioni [ [Precedente](#) | [Successivo](#) ]

[Crea Nuova Discussione](#) [Attiva notifica mail](#) [Sposta la Discussione](#)

**MARIA PRANDINI**

Messaggi: 4  
Messaggi recenti

**La Digitalizzazione nell'Industria Manifatturiera - Siemens Italia**  
25/09/19 22.52

[← Rispondi](#) [» Rispondi con Citazione](#)

Martedì 15 ottobre 2019 alle ore 17:15 si terrà in Sala Conferenze "Emilio Gatti" – DEIB, Politecnico di Milano, l'intervento di Siemens Italia

**La Digitalizzazione nell'Industria Manifatturiera**  
**Roberto Zuffada – Responsabile Digital Enterprise Siemens Italia**

L'evento è rivolto agli studenti del terzo anno della triennale e a quelli della laurea magistrale.

L'iscrizione tramite il link <https://forms.gle/ZLdBYaGBfZB6NfbA8> è obbligatoria.

**Allegati:** Locandina Intervento SIEMENS\_15\_ottobre\_2019.pdf (714,2k)

# Extra-training activities and Tutoring





# Training beyond the MSc study programme

**Massive Online Open Courses (MOOCs)** – [www.pok.polimi.it](http://www.pok.polimi.it)

POLIMI portal of free online courses to support students in their academic and professional career

A **certificate of attendance** is provided if the final test is passed

**Passion in action** – [www.polimi.it/corsi/passion-in-action/](http://www.polimi.it/corsi/passion-in-action/)

**open participation** teaching activities that the Politecnico offers to its students to **support the development of transversal, soft and social skills**

Acquired skills will be accredited on the **Diploma Supplement**

*Some examples of interest for you:*

Matlab/Simulink per l'analisi e il progetto di sistemi di controllo; Hands-on Automatic Control and Robotics Laboratory; UAV Lab

# Tutoring services offered by your School

The tutoring services of the School support students during their studies with **student-tutors** and **teachers**.

Tutors have the task of:

- Be a reference point for problems related to teaching activities
- Helping students that have issues with specific courses with **clarifications on unclear concepts and exercises**



The School offers different tutoring opportunities to its BSc and MSc students. The approach includes some peer-to-peer tutoring, provided on-demand, and more traditional tutoring services, provided on established schedule.

[www.ingindinf.polimi.it/en/students/tutoring/](http://www.ingindinf.polimi.it/en/students/tutoring/)

# Tutoring for MSc students

## **Equalization tutoring peer-to-peer**

the service is dedicated mainly to international students. More experienced student-tutors provide help, individually or in small groups of 3-4 people, on the basic courses of the MSc programme. It is possible to request tutoring both during the semester of course delivery, and at other times of the year by emailing [tutorato-ingegneria@polimi.it](mailto:tutorato-ingegneria@polimi.it)

You can be involved as a tutor!

# International exchange programs





# Experience abroad

POLIMI offers to its students many opportunities for gaining experience abroad:

- **study mobility**  
get credits attending courses and activities at partner universities (prepare a thesis)
- **double degree**  
get two degrees, one in POLIMI and one in the partner university

Every year POLIMI issues a call for international student mobility to which you have to apply for accessing mobility opportunities



[www.polimi.it/en/services-and-opportunities/experience-abroad/](http://www.polimi.it/en/services-and-opportunities/experience-abroad/)

# International mobility committee of your Study Programme

## **Prof. Luca Bascetta**

DEIB, building 20

tel: 02 2399 3440

e-mail: [luca.bascetta@polimi.it](mailto:luca.bascetta@polimi.it)



## **Prof. Matteo Corno**

DEIB, building 20

tel: 02 2399 4037

e-mail: [matteo.corno@polimi.it](mailto:matteo.corno@polimi.it)



[www.ccsatm.polimi.it/studenti/mobilita-internazionale/?lang=en](http://www.ccsatm.polimi.it/studenti/mobilita-internazionale/?lang=en)

# Selecting a hosting university

**POLITECNICO MILANO 1863**  
manifesti

**Degree programme**  
Programme Structure  
Show/Search Programme  
Save Document

**Degree Programme**  
Read Degree Programme  
Faculty  
Infrastructures  
IM Quantitative data

**International context**

**Customized Schedule**  
Your customized time schedule has been disabled  
Enable

**Search**  
Search a Professor  
Search a Course  
Search a Course (system prior D.M. n. 509)  
Search Lessons taught in English

**International context: on this page are listed, broken down by country, Erasmus exchange programs, bilateral international agreements and double degree agreements.**

Academic Year: 2019/2020  
School: School of Industrial and Information Engineering (Ing. Ind-Inf)  
Programme: Automation and Control Engineering (473)  
Exchange type: All exchange programmes  
Refresh

Country	University ID	University	Exchange programmes type
Australia	AUS KENSING01	University Of New South Wales	Bilateral Agreement Extra Ue
Austria	A WIEN02	Technische Universitat Wien	Erasmus Programme
Belgium	B LEUVEN01	Katholieke Universiteit Leuven	Erasmus Programme
	B LOUVAIN01	Universite' Catholique De Louvain	Erasmus Programme
	B BRUXEL04	Universite' Libre De Bruxelles	Erasmus Programme
Brazil	BRA SAOPAU04	Universidade De Sao Paulo	Double Degree Extra Ue
	BRA SAOPAU04	Universidade De Sao Paulo	Bilateral Agreement Extra Ue
	BRA FLORIAN01	Universidade Do Estado De Santa Caterina - Udesc	Bilateral Agreement Extra Ue
	BRA CAMPINAS01	Universidade Estadual De Campinas	Double Degree Extra Ue
	BRA CAMPINAS01	Universidade Estadual De Campinas	Bilateral Agreement Extra Ue
	BRA RIODEJAN02	Universidade Federal Do Rio De Janeiro	Bilateral Agreement Extra Ue
	BRA NATAL01	Universidade Federal Do Rio Grande Do Norte	Bilateral Agreement Extra Ue
Canada	CAN MONTREA05	Ecole De Technologie Superieure	Bilateral Agreement Extra Ue

[www4.ceda.polimi.it/manifesti/manifesti/controller/extra/ScambiInternazionaliPublic.do](http://www4.ceda.polimi.it/manifesti/manifesti/controller/extra/ScambiInternazionaliPublic.do)

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**Degree Programme**  
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Austria	A WIEN02	Technische Universität Wien	
Belgium	B LEUVEN01	Katholieke Universiteit Leuven	Erasmus Programme
	B LOUVAIN01	Université Catholique De Louvain	Erasmus Programme
	B BRUXEL04	Université Libre De Bruxelles	
Brazil	BRA SAOPAU04	Universidade De São Paulo	
	BRA SAOPAU04	Universidade De São Paulo	
	BRA FLORIAN01	Universidade Do Estado De Santa Catarina	
	BRA CAMPINAS01	Universidade Estadual De Campinas	
	BRA CAMPINAS01	Universidade Estadual De Campinas	
	BRA RIODEJAN02	Universidade Federal Do Rio De Janeiro	
	BRA NATAL01	Universidade Federal Do Rio Grande Do Norte	
Canada	CAN MONTREA05	Ecole De Technologie Supérieure	

Ask to the Exchange Office of the hosting university the deadline to submit the learning agreement

Check the list of courses available at the hosting institution during the mobility period, verify that courses equivalent to the ones in POLIMI study plan exist



# Preparing a learning agreement

The screenshot shows the website of the School of Industrial and Information Engineering at Politecnico di Milano. The header includes the university logo and the school name. A navigation bar contains links for HOME, SCHOOL, TEACHING, and STUDENTS. The STUDENTS menu is open, showing options like Admission to the School's B and MS programmes, English OFA, Study plans, Programme transfers and changes, Experience abroad (highlighted with a red arrow), Tutoring, Scholarships and graduation awards, Education ombudsman, Trouble ticketing, and POLIMI SPORT. The main content area is titled 'Experience abroad' and contains text about participation in joint programmes. A link for 'Experience abroad opportunities' is present, and a link for 'Further information on experience abroad (in Italian)' is highlighted with a red arrow. Below this is the 'International mobility board' section, listing the coordinator as prof. Franco Bernelli Zazzera and the department as Aerospace Engineering.

POLITECNICO MILANO 1863

SCHOOL OF INDUSTRIAL AND INFORMATION ENGINEERING

HOME SCHOOL TEACHING STUDENTS

Admission to the School's B and MS programmes  
English OFA (additional educational obligation)  
Study plans  
Programme transfers and changes  
Experience abroad  
Tutoring  
Scholarships and graduation awards  
Education ombudsman  
Trouble ticketing  
POLIMI SPORT

Homepage > Students > Experience abroad

### Experience abroad

The Politecnico di Milano offers the School's students the opportunity to participate in joint programmes and special agreements with many partner universities.

[Experience abroad opportunities](#)

[Further information on experience abroad \(in Italian\)](#)

You can also contact your programme coordinator for more details and to arrange an experience abroad.

### International mobility board

Coordinator: prof. [Franco Bernelli Zazzera](#)

Aerospace Engineering

[www.ingindinf.polimi.it/en/students/experience-abroad/](http://www.ingindinf.polimi.it/en/students/experience-abroad/)

# Preparing a learning agreement

**POLITECNICO MILANO 1863**

SCHOOL OF INDUSTRIAL AND INFORMATION ENGINEERING

HOME SCHOOL TEACHING STUDENTS

Admission to the School's B and MS programmes  
English OFA (additional educational obligation)  
Study plans  
Programme transfers and changes  
Experience abroad  
Tutoring  
Scholarships and graduation awards  
Education ombudsman  
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POLIMI SPORT

[Homepage](#) > [Students](#) > Experience abroad

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[Experience abroad opportunities](#)

[Further information on experience abroad](#) (in Italian)

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### International mobility board

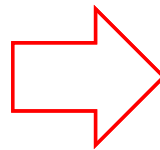
Coordinator: prof. [Franco Bernelli Zazzera](#)

Aerospace Engineering

The document explains the rules to prepare a learning agreement, and the rules to convert the marks related to the exams passed at the hosting institution

# Preparing a learning agreement

The archive of resolutions concerning international exchange programmes can be used to check the equivalence between two courses



nuovo di numero	🔍 ⚙
Tesserino PoliCard - attivazione, visualizzazione stato, prenotazione riemissione	☆
Richiesta certificati e autocertificazione	☆
Domande? FAQ e contatti	★
Modifica dati anagrafici personali	☆
Indicazioni modalità di pagamento	☆
Compilazione questionari	☆
Tasse e agevolazioni economiche	★
Corsi sicurezza, privacy e GDPR	☆
<b>Agevolazioni e convenzioni</b>	▼
<b>Esami</b>	▼
<b>Laurea - Titolo finale</b>	▼
<b>Richieste di ammissione</b>	▼
<b>Post laurea</b>	▼
<b>Mobilità internazionale</b>	▲
Archivio insegnamenti convalidati nell'ambito dei Programmi di scambio internazionali	☆
Catalogo corsi di lingua	☆
Mobilità internazionale per studio	☆
Mobilità internazionale per stage/tirocinio	☆
<b>Servizi ICT di Ateneo</b>	▲
Virtual desktop	☆
Servizi ICT di Ateneo, catalogo generale	☆
APP Mobile	☆
<b>Concorsi e selezioni</b>	▲
Concorso/selezione per affidamento di incarico/posizione	☆

Portale Servizi v. 2.3.2 / 2.3.2

Area Servizi ICT

02/10/2019

[www.polimi.it/servizi-online/](http://www.polimi.it/servizi-online/)

# A period abroad to prepare a thesis

A thesis (all or part of the work) abroad can be done:

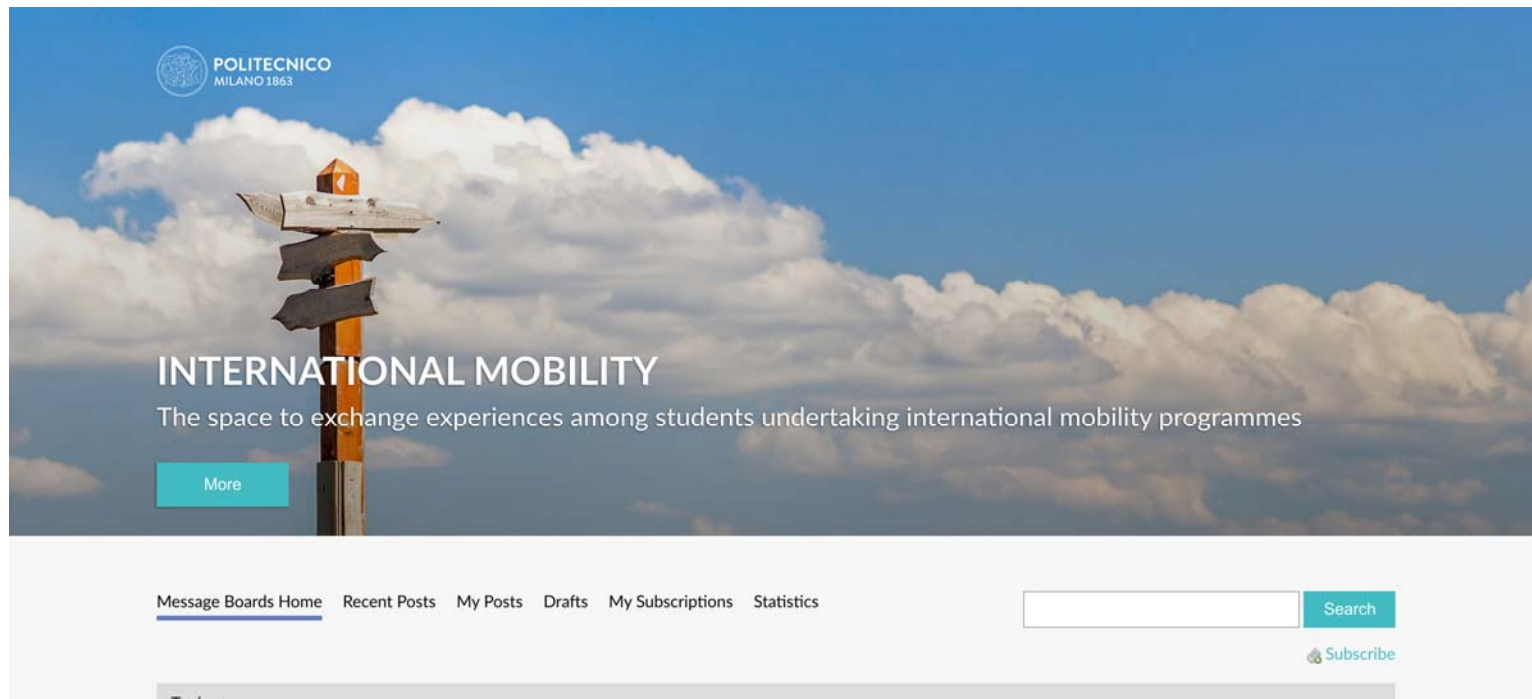
- with the support of a mobility program;
- with the support of the scholarships “[Tesi all'estero](#)”;
- as a free-mover (pay attention to tuition fees and insurances).

Thesis has to be defended at POLIMI and the supervisor has to be a POLIMI professor.

A few suggestions:

- find a supervisor and contact her/him before leaving;
- if you know the thesis topic in advance, select the POLIMI supervisor according to the topic;
- if you have information on the thesis project in advance, discuss with the POLIMI supervisor in order to understand if it can be considered a “thesis with reviewer” or a “thesis without reviewer”.

# International Mobility Beep channel



[beep.metid.polimi.it/web/mobilita-internazionale/](http://beep.metid.polimi.it/web/mobilita-internazionale/)



# The Automation and Control Engineering MSc Programme



# Programme requirements

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## **How is the programme organized?**

- the programme is organized in two years, four semesters
- most of the courses are held at Leonardo Campus, a few at Bovisa Campus.

# Programme requirements

## How is the programme organized?

- the programme is organized in two years, four semesters
- most of the courses are held at Leonardo Campus, a few at Bovisa Campus.

## What are the rules to obtain your MSc degree?

You have to earn **120 credits**:

- 60 credits of **mandatory courses**:
  - 45 on qualifying subjects (systems and control, identification, converters and drives, applied mechanics)
  - 15 credits on subsidiary subjects (computer science, electronics, measurements, industrial production technologies)
- 40 credits of **complementary courses**
- a **final thesis** corresponding to 20 credits

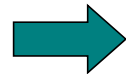
# Programme requirements

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- each student has to present a **study plan**
- study plans can be pre-approved or autonomous

# Study plan

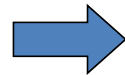
1st year



Course title	Credits (CFU)	Semester
Computer aided manufacturing	10	1
Dynamics of mechanical systems	10	1
Model identification and data analysis	10	1
Advanced and multivariable control	10	2
Dynamics of electrical machines and drives	10	2
<i>Complementary courses</i>	10	2



2nd year

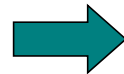


Course title	Credits (CFU)	Semester
Software Engineering (for Automation)	5	2
Automation and Control Laboratory	5	2
<i>Complementary courses</i>	30	1, 2
Thesis	20	1, 2



# Study plan

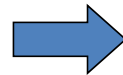
1st year



Course title	Credits (CFU)	Semester
Computer aided manufacturing	10	1
Dynamics of mechanical systems	10	1
Model identification and data analysis	10	1
Advanced and multivariable control	10	2
Dynamics of electrical machines and drives	10	2
<i>Complementary courses</i>	10	2



2nd year



Course title	Credits (CFU)	Semester
Software Engineering (for Automation)	5	2
<b>Automation and Control Laboratory</b>	5	2
<i>Complementary courses</i>	30	1, 2
Thesis	20	1, 2

# Automation and Control Laboratory

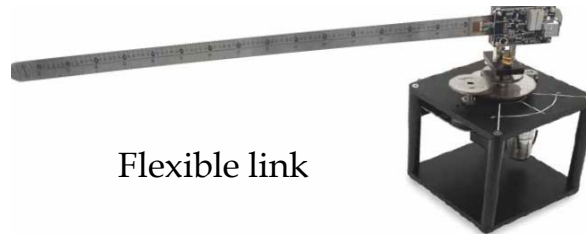
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- Course held [in a lab](#)
- Students are divided in groups, working on various experimental set-up
- The course is offered in the second semester of the second year

# Automation and Control Laboratory



QUBE- Servo 2  
(2 unità)



Flexible link



Flexible joint



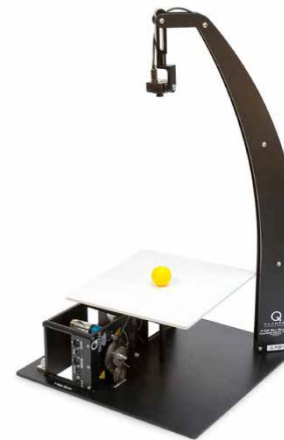
Ball and beam



Inverted  
pendulum



Torsion module



2 DOF ball balancer



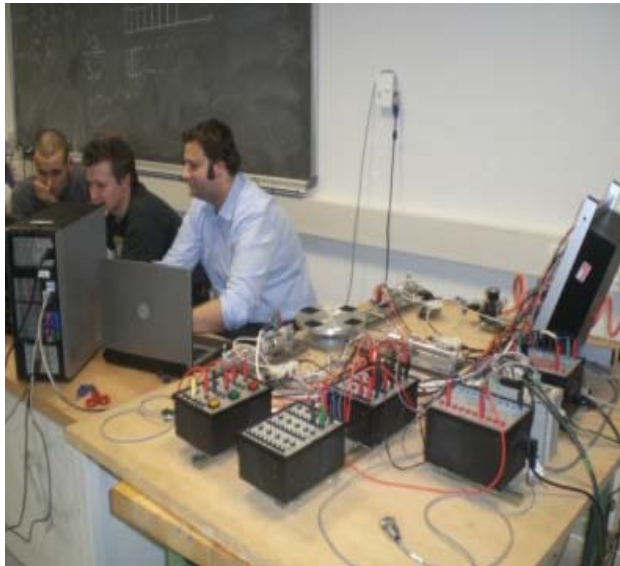
2 DOF robot module

# Automation and Control Laboratory

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- Starting from 2019-20 there are two Automation and Control Laboratory Courses:
  - one located at the Mechanical Engineering Department (Bovisa Campus)
  - a new one located at Building n. 7 (Leonardo Campus)
- Two different codes, same name
- The one at Leonardo Campus has a limited number of seats

# Automation and Control Laboratory (Bovisa Campus)



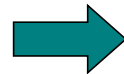


# Automation and Control Laboratory (Leonardo Campus)



# Study plan

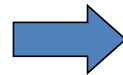
1st year



Course title	Credits (CFU)	Semester
Computer aided manufacturing	10	1
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Advanced and multivariable control	10	2
Dynamics of electrical machines and drives	10	2
<i>Complementary courses</i>	<i>10</i>	2



2nd year



Course title	Credits (CFU)	Semester
Software Engineering (for Automation)	5	2
Automation and Control Laboratory	5	2
<i>Complementary courses</i>	<i>30</i>	1, 2
Thesis	20	1, 2

# Study plan – Complementary courses

- Tables of suggested courses:
  - TAB1 (1st semester) and TAB2 (2nd semester)
  - TAB3 (1st semester) and TAB4 (2nd semester)
- schedules of courses in TAB1 and TAB2 will not overlap, the same is not guaranteed for courses in TAB3 and TAB4
- **at least 20 credits out of 40 credits must be taken from TAB1 or TAB2** (a larger number of credits is suggested)

# Courses in TAB1 and TAB2

Course title	Credits (CFU)
<i>Advanced measurement systems for control applications</i>	5
<i>Advanced process control</i>	5
<i>Automation and control in vehicles</i>	5
<i>Automation of energy systems</i>	5
<i>Constrained numerical optimization for estimation and control</i>	5
<i>Control of industrial robots</i>	5
<i>Control of mobile robots</i>	5
<i>Data driven control system design</i>	5
<i>High-tech entrepreneurship</i>	5
<i>Networked control</i>	5
<i>Noise and vibration engineering</i>	5
<i>Nonlinear control</i>	5
<i>Numerical analysis</i>	5
<i>Power electronics and supplies</i>	5
<i>Project work</i>	5
<i>Production systems control</i>	5
<i>Robust control</i>	5
<i>Safety in automation systems</i>	5
<i>Simulation techniques and tools</i>	5
<i>Systems theory</i>	5
<i>Further courses</i>	...

# Courses in TAB1 and TAB2

Course title	Credits (CFU)
<i>Advanced measurement systems for control applications</i>	5
<i>Advanced process control</i>	5
<i>Automation and control in vehicles</i>	5
<i>Automation of energy systems</i>	5
<i>Constrained numerical optimization for estimation and control</i>	5
<i>Control of industrial robots</i>	5
<i>Control of mobile robots</i>	5
<i>Data driven control system design</i>	5
<i>High-tech entrepreneurship</i>	5
<i>Networked control</i>	5
<i>Noise and vibration engineering</i>	5
<i>Nonlinear control</i>	5
<i>Numerical analysis</i>	5
<i>Power electronics and supplies</i>	5
<i>Project work</i>	5
<i>Production systems control</i>	5
<i>Robust control</i>	5
<i>Safety in automation systems</i>	5
<i>Simulation techniques and tools</i>	5
<i>Systems theory</i>	5
<i>Further courses</i>	...





# Project Works

- Project Works are courses made in [collaboration with companies](#)
- Companies propose «[open innovation](#)» topics, on design activities in the field of automation and control
- Each project work is run under the supervision of [an academic and an industrial tutor](#)
- Students work in small groups during the semester
- Usually a [weekly meeting with the industrial tutor](#) is arranged
- At the end of the Project Work students [prepare a report and discuss the project](#) in front of the academic and the industrial tutor and the other students

# Project Works

## When to apply

- Project Works are usually offered in the [first semester of the second year](#)
- At the beginning of September, available Project Works are announced to [students of the second year of the programme](#).
- At most 15 students are admitted in each Project Work.
- If further Project Works are proposed at a later stage for the second semester, then, a second announcement is made in February.

## Requirements

- Students can apply if they have already earned [at least 40 credits](#).  
The [ranking](#) is made based on the [average of grades](#) and the [preferences](#) expressed by the students.

# Project Work Delegate

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Prof. Paolo Rocco  
DEIB, building 20  
tel: 02 2399 3685  
e-mail: [paolo.rocco@polimi.it](mailto:paolo.rocco@polimi.it)

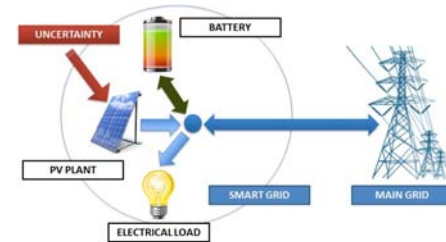


## Project Works – 2019/20

- Control system and actuation for an electronically active sole of a shoe - The very first active sole able to adapt its morphology to changes both in the external environment, like terrain, temperature or humidity, and in the dynamic state of the user: design and development of actuation, sensing and control systems  
Academic tutor: Prof. Sergio Matteo Savaresi – Partner company: **e-Novia S.p.A.**
- Control system for an autonomous micro vehicle for urban goods delivery - A fully autonomous micro electric vehicle for urban delivery of goods: design and development of an architecture for electric powertrain, sensing and control systems  
Academic tutor: Prof. Matteo Corno – Partner company: **YAPE S.r.l.**
- Intelligent collaborative robotics - Innovative functionalities for collaborative robots (cobots) based on control, prediction, and optimization technologies  
Academic tutor: Prof. Paolo Rocco – Partner company: **Smart Robots srl**

# Courses in TAB1 and TAB2

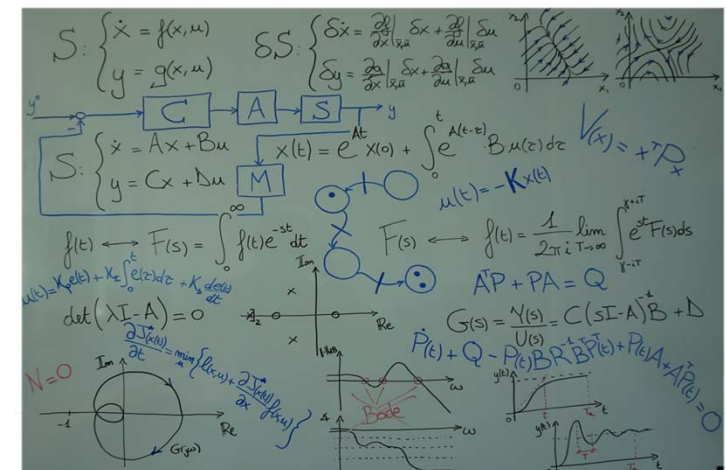
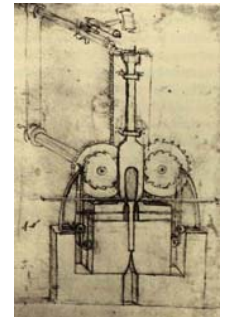
Course title	Credits (CFU)
Advanced measurement systems for control applications	5
Advanced process control	5
Automation and control in vehicles	5
Automation of energy systems	5
Constrained numerical optimization for estimation and control	5
Control of industrial robots	5
Control of mobile robots	5
Data driven control system design	5
High-tech entrepreneurship	5
Networked control	5
Noise and vibration engineering	5
Nonlinear control	5
Numerical analysis	5
Power electronics and supplies	5
Project work	5
Production systems control	5
Robust control	5
Safety in automation systems	5
Simulation techniques and tools	5
Systems theory	5
Further courses	...





# Courses in TAB1 and TAB2

Course title	Credits (CFU)
Advanced measurement systems for control applications	5
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Nonlinear control	5
Numerical analysis	5
Power electronics and supplies	5
Project work	5
Production systems control	5
Robust control	5
Safety in automation systems	5
Simulation techniques and tools	5
Systems theory	5
Further courses	...



## Study plan – Complementary courses

- at least 20 credits out of 40 credits must be taken from TAB1 or TAB2 (a larger number of credits is suggested)
- the residual 20 credits should be chosen from TAB1, TAB2, TAB3 and TAB4
- students can also include a maximum of 10 credits of freely chosen courses

# Autonomous study plans

- Each student is expected to present his/her study plan
- If the study plan is compliant with the suggested study plans, it is automatically approved (“pre-approved”)
- Otherwise the study plan will be considered “autonomous” and then subjected to approval by a committee
- In particular, if students include freely chosen courses (up to 10 credits max), then the committee will assess the adequacy of such courses with the learning objectives of the programme

# Study Plan Committee

## Prof. Simone Garatti

DEIB, building 20

tel: 02 2399 3650

e-mail: [simone.garatti@polimi.it](mailto:simone.garatti@polimi.it)



## Prof. Marcello Farina

DEIB, building 20

tel: 02 2399 3599

e-mail: [marcello.farina@polimi.it](mailto:marcello.farina@polimi.it)



It is advisable to contact Prof. Garatti or Prof. Farina before submitting an autonomous study plan

# Thesis

	Thesis with reviewer "Tesi"	Thesis without reviewer "Tesina"
Expected outcome	<i>an innovative project in the field of automation and control</i>	<i>a (maybe less) innovative project in the field of automation and control</i>
Reviewer required	yes	no
Maximum increment for the final grade	7/110	4/110

You can ask to any of your professors for a topic for your thesis.

# Degree awards

2 Degree Awards for the Best MSc Thesis in Automation and Control Engineering entitled to

- **Prof. Claudio Maffezzoni**  
*for the Best Thesis on the Application of advanced techniques for automation and control in highly technological fields*
- **Prof. Nicola Schiavoni**  
*for the Best Thesis on the Development of innovative methodologies for automation and control*

The call for year 2020 will be published in June 2020. A thesis can be submitted if it was defended in the year starting May 1, 2019 and ending April 30, 2020.



# Honours Program ‘Scientific Research in Information Technology’

The Honours Programme is an extracurricular program offered that aims at **training MSc students in conducting scientific research in Information technology.**

Once obtained, the honours program title will officially appear in the student's diploma supplement together with a description of the activities performed.

The programme includes two main elements:

- extra curricular exams
- realization of a thesis with significant results of scientific research in the field of information technology leading to a scientific document

# Honours Program ‘Scientific Research in Information Technology’

## **Courses (soft skills)**

- Scientific research
- Scientific communication

## **Research activities (additional w.r.t. the MSc thesis)**

- State of the art and project proposal (report and presentation)
- Research laboratory and manuscript (report/article)
- Reviewing, rebuttal, and presentation (report and presentation)

# Research topics in Automation and Control Engineering

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## Theory and Application of Control and Optimization

**Description:** The research area includes all the topics related to the theory and application of modeling, control, identification, learning, and optimization methods for dynamic systems. Applications include, but are not limited to, energy systems, smart grids, vehicles.

**Proponents:** M. Corno, L. Fagiano, M. Prandini, S. Savaresi, R. Scattolini, M. Tanelli

**Positions available:** 5

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## Robotics, Mechatronics, and Industrial Automation

**Description:** The research area includes topics related to modelling and control of robots (industrial, mobile, aerial) and mechatronic systems in general. The broader area of industrial automation is included as well. Experimental facilities to validate the theoretical results will be available.

**Proponents:** L. Bascetta, L. Ferrarini, G. Gruosso, P. Rocco

**Positions available:** 3

# Honours Program 'Scientific Research in Information Technology'

## Application

- First call (March/April)  
students enrolled at the second semester of the first year of the MSc track, with 20 CFUs and 28 GPA  
[from the latest 2019 call]
- Second call (October):  
students enrolled at the first semester of the second year of the MSc track, with 50 CFUs and 28 GPA  
[from the latest 2019 call]

## Websites

Deadlines for the applications, rules etc... are posted at [www.honours-programme.deib.polimi.it](http://www.honours-programme.deib.polimi.it)

Details on the latest call published at

<https://www.polimi.it/en/programmes/high-level-training-courses/honours-programme-scientific-research-in-information-technology-esr-it/>

will be available soon. Deadline for applying: October 25, 2019

# Reference person for Automation and Control Engineering

Prof. Patrizio Colaneri

DEIB, building 20

tel: 02 2399 3656

e-mail: [patrizio.colaneri@polimi.it](mailto:patrizio.colaneri@polimi.it)



# Visit to a SPS Trade Show

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“Lezioni in fiera”

a chance for MSc students to visit SPS (Smart Production Solution) Italia leading Trade Show for the Industrial Automation and Digitalisation in Italy, and attend presentations of key industrial players in the field

Where?

Fiere di Parma Fairground

When?

26-28 May 2020

You will be invited to participate to a one-day visit organized typically by Prof. Alberto Leva.