PhD Programme in

# Computer and Control Engineering

**Welcome meeting 40th cycle (3rd session)**

March 21, 2025

Politecnico di Torino

# 40th Cyle Students (Sessions 1 and 2)

| LAST NAME | FIRST NAME | CYCLE | SESSION | SUPERVISOR | CO-SUPERVISORS |
|---|---|---|---|---|---|
| Yassine | Ali | 40 | 1/2 | Cagliero | Vassio |
| Bachiorrini | Gianmarco | 40 | 1/2 | Valenza | Bringhenti |
| Barco | Luca | 40 | 1/2 | Garza | Arnaudo |
| Basci | Pietro | 40 | 1/2 | Morra | Cerquitelli |
| Buccellato | Federico | 40 | 1/2 | Sterpone | Azimi |
| Cipollini | Marco | 40 | 1/2 | Montrucchio | Terzo |
| Colaiacomo | Davide | 40 | 1/2 | Basile | Lioy |
| Digiacomo | Federico | 40 | 1/2 | Olmo | Gumiero, Dellatorre |
| Gensale | Aurora | 40 | 1/2 | Cagliero | Basile |
| Pecora | Alessandro Emanuel | 40 | 1/2 | Bottino | Strada |
| Perrone | Giuseppe | 40 | 1/2 | Casetti | Rapelli |
| Re | Alice | 40 | 1/2 | Fosson | Regruto |
| Rinaudi | Federico | 40 | 1/2 | Marchetto | Sacco |
| Rizza | Rosario | 40 | 1/2 | Sisto | Valenza |
| Savelli | Claudio | 40 | 1/2 | Baralis | Giobergia |
| Schwartz | Robert Everett | 40 | 1/2 | Monge | De Russis |
| Sordello | Andrea | 40 | 1/2 | Mellia | Drago |
| Torlini | Matia | 40 | 1/2 | Patti | Macii E. |
| Varizov | Etibar | 40 | 1/2 | Apiletti | Garza |
| Verna | Alberto | 40 | 1/2 | Mellia | Vassio |
| Zhao | Yuqi | 40 | 1/2 | Mellia | Giordano |
| Wang | Changhao | 39 | Co-tutelle | Cantoro | Li |

# 40th Cyle Students (Session 3)

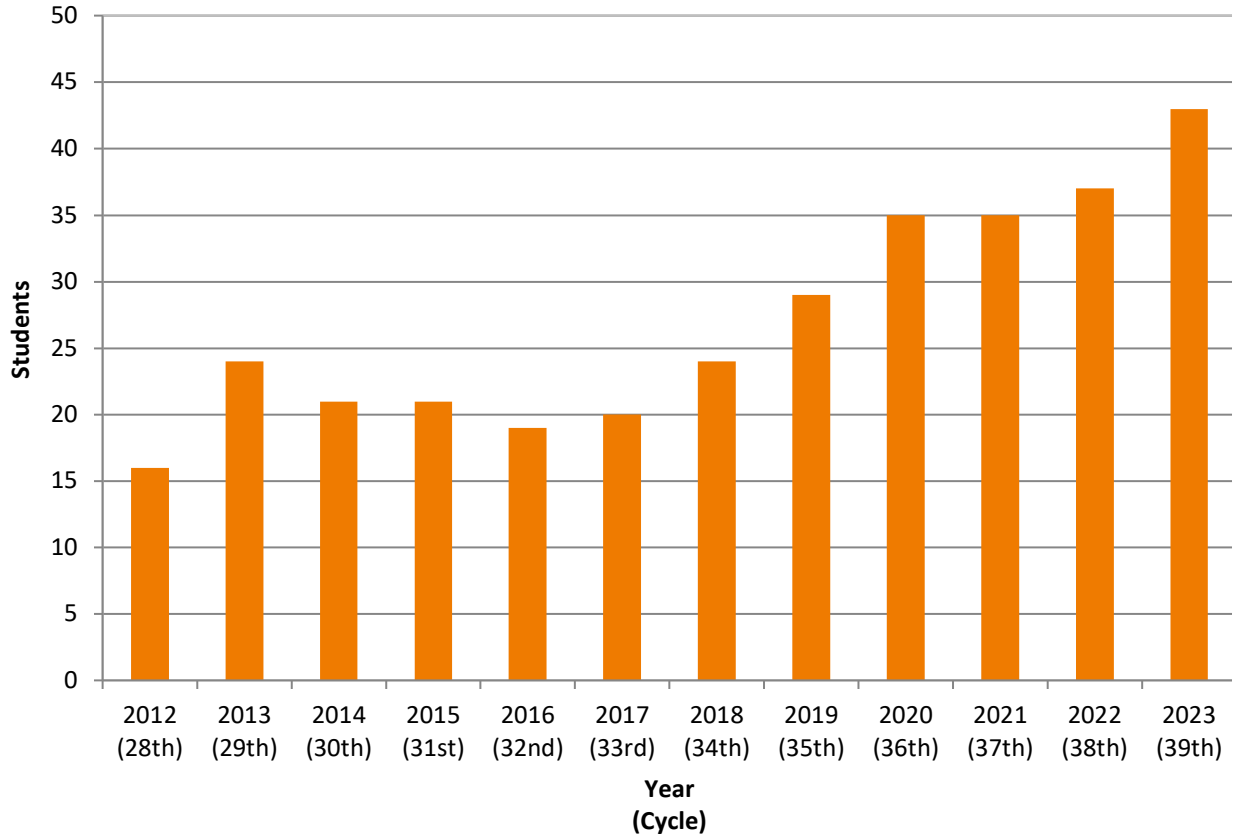
| LAST NAME | FIRST NAME | CYCLE | SESSION | SUPERVISOR | CO-SUPERVISORS |
|---|---|---|---|---|---|
| OLIVA | ATTILIO | 40 | 3 | Risso | Elia |
| AMINI BARDPAREH | ARASH | 40 | 3 | Sterpone | De Sio |
| PANICO | CHIARA | 40 | 3 | Ferrero | Carbone |
| VACCARO | FRANCESCO | 40 | 3 | Lioy | Basile |
| LOFFA | MARIA ADELAIDE | 40 | 3 | Bottaccioli | Macii, Patti |
| ARNAUDO | ANNA | 40 | 3 | Coppola | Morisio |
| VILAR DE FARIAS | GUSTAVO | 40 | 3 | Sonza | Rodriguez |
| CUI | AOBO | 40 | 3 | Sterpone | Azimi |
| BHATTACHARYA | SOHAM | 40 | 3 | Sterpone | Pisoni |
| ABED | SERGIU | 40 | 3 | Sonza | Bluethgen, Cagri Bagbaba |

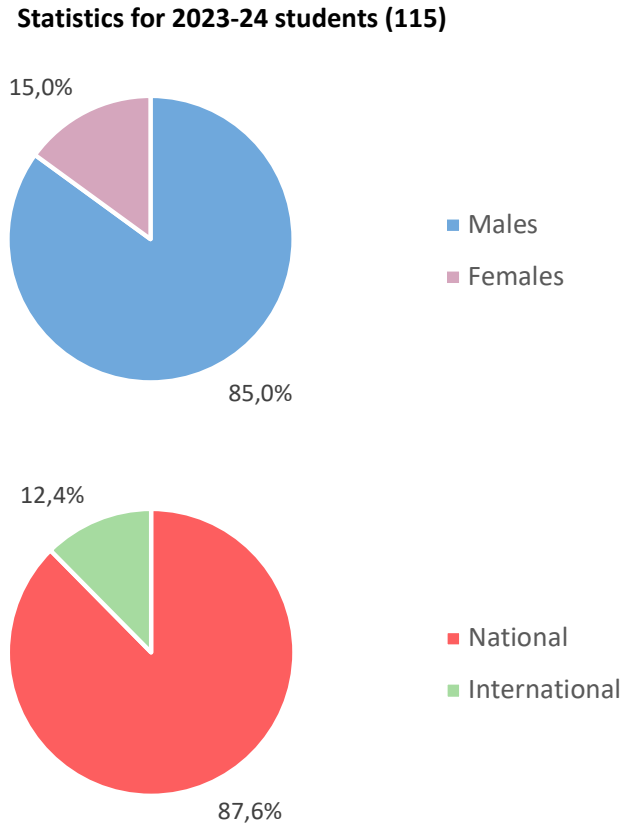
# 40th Cyle Positions

Types of scholarships/positions (first and second session)

- Funded/co-funded by Ministry, Politecnico di Torino, Department
- Co-funded by Fondazione CRT
- Funded/co-funded by Interdepartmental Centers
- Funded/co-funded by external bodies
- Partly funded by Ministry, partly by companies (DM630/2024)
- Partly funded by PNNR, partly by the Department
- “Executive” (company employees)
- Apprenticeships
- Positions without scholarship (or funded by foreign bodies, e.g., CSC)
- …

# Previous Cycles



# Goal of the/a PhD Curriculum

To train the students to become high-level researchers able to

- Fill in senior roles in industry as well undertake an academic career
- Effectively compete with PhD students from similar institutions

A PhD student should become able to autonomously perform research, i.e.:

- Identifying promising research areas
- Devising, developing and evaluating innovative ideas and solutions
- Disseminating them in the worldwide research community (writing papers, presenting his/her work at conferences, etc.)
- Interacting with other researchers from industry or academia
- Attracting resources (i.e., preparing successful research projects)
- Tutoring new researchers (e.g., MSc students)
- …

# PhD at Politecnico di Torino and Doctoral School (Scudo)

The Doctoral School (Scudo) is the “central” body

- Managing all the PhD Programmes of Politecnico di Torino
- Performing most of the related administrative work
- Defining specific rules at Politecnico di Torino’s level

It is governed by a Board (“Consiglio”) including

- The Coordinators/Chairs of the Academic Boards of the different PhD Programmes
- Student representatives

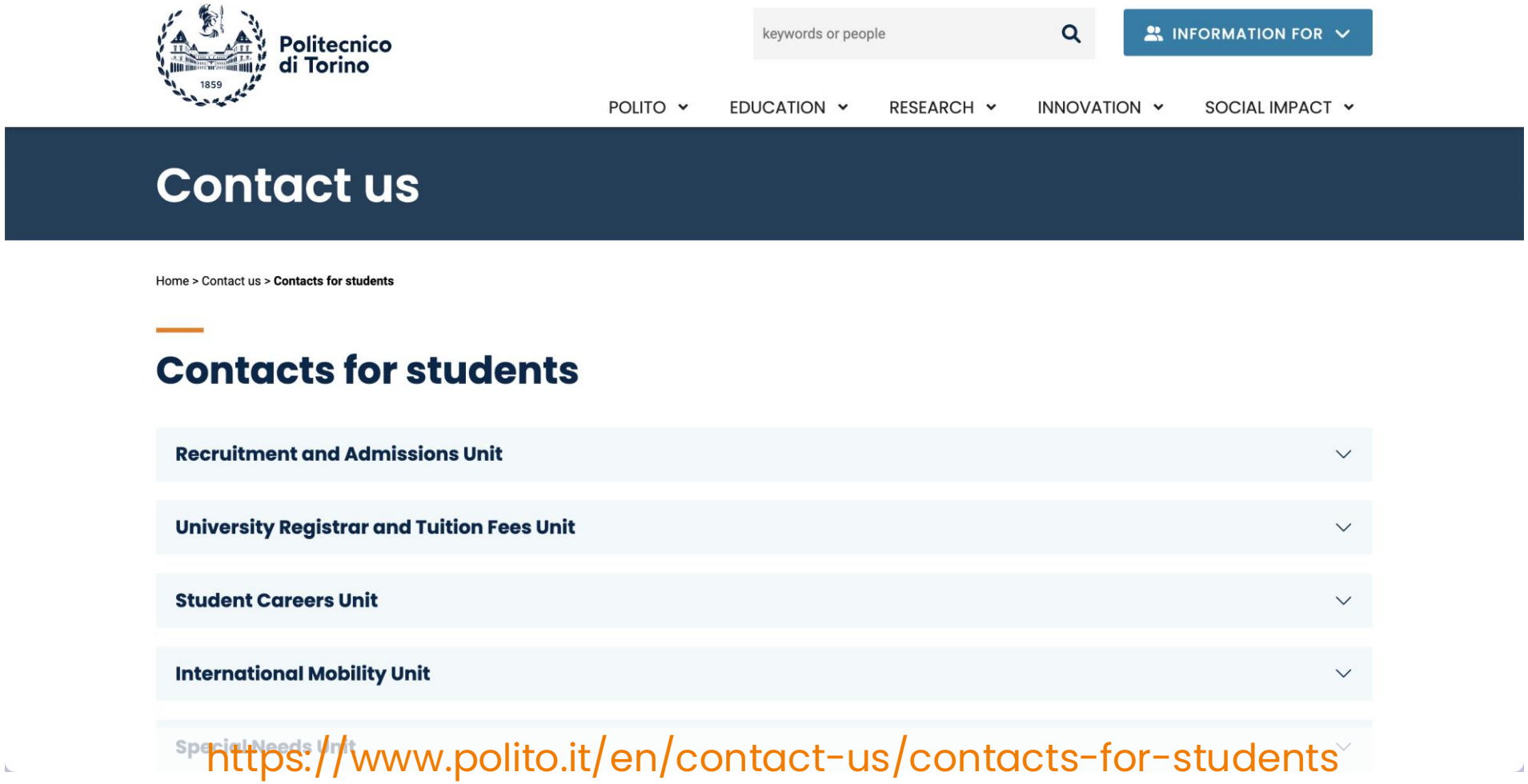
Director/Chair

- Prof. Stefano Grivet Talocia

# Scudo Website


https://www.polito.it/en/education/phd-programmes-and-postgraduate-school

# Contacting Scudo and Ticketing Service




https://www.polito.it/en/contact-us/contacts-for-students

# PhD Programmes at Politecnico di Torino

For the 40th cycle, the Doctoral School activated 18 PhD programmes:

- Aerospace Engineering
- Architectural Heritage
- Architecture. History and Project
- Artificial Intelligence - Industry
- Bioengin. and Medical-Surgical Sciences
- Chemical Engineering
- Civil and Environmental Engineering
- Computer and Control Engineering
- Design and Technology. People, Systems, Environment
- Electrical, Electronics and Comm. Engineering
- Energetics
- Management and Production Engineering
- Materials Science and Technology
- Mathematical Sciences
- Mechanical Engineering
- Physics
- Sustainable Materials, Processes and Systems for Energy Transition
- Urban and Regional Development

# Departments at Politecnico di Torino

Politecnico di Torino is organized in 11 Departments, managing both teaching and research:

- Department of Architecture and Design (DAD)
- Department of Control and Computer Engineering (DAUIN)
- Department of Electronics and Telecommunications (DET)
- Department of Environment, Land and Infrastructure Engineering (DIATI)
- Department of Management and Production Engineering (DIGEP)
- Department of Mechanical and Aerospace Engineering (DIMEAS)
- Department of Structural, Geotechnical and Building Engineering (DISEG)
- Department of Mathematical Sciences “G. L. Lagrange” (DISMA)
- Department of Energy “Galileo Ferraris” (DENERG)
- Interuniversity Department of Regional and Urban Studies and Planning (DIST)
- Department of Applied Science and Technology (DISAT)

# Department of Control and Computer Engineering (DAUIN)

The PhD Programme in Computer and Control Engineering is offered by the Department of Control and Computer Engineering (DAUIN)

Since the last four cycles, the Department is also offering the PhD Programme in AI – Industry, with some of the students hosted at the Department, others distributed across Italy

Head/Director: Prof. Luca Sterpone

The Department

- Has 70+ faculty members, 20+ staff members, and 160+ PhD students, post-doc and temporary members
- Covers two major areas: Computer engineering, and Control engineering
- From an administrative point of view, it is split in research “groups”

# DAUIN Website


https://www.dauin.polito.it/en/

# DAUIN
# Wiki


https://dauin-si.polito.it/webapps/mediawiki-1.32.0/index.php/Home

# PhD Programme in Computer and Control Engineering


https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/phd-programmes/computer-and-control-engineering

# PhD Programme in Computer and Control Engineering

The PhD Programme in Computer and Control Engineering is managed by an Academic Board (“Collegio dei Docenti”)

- 24 members and two student representatives

The Academic Board board is in charge of

- Defining specific rules for the PhD Programme
- Assigning supervisors (tutors) to PhD students
- Evaluating their activities and deciding on admissions to following year/final exam
- Identifying PhD training activities
- Facing critical situations
- …

Administrative support is additionally provided by several staff members of the DAUIN (“Segreteria Amministrativa”)

# PhD Programme
# Academic Board & Student Representatives

**Coordinator**

LAMBERTI Fabrizio

**Vice Coordinator**

MARCHETTO Guido

**Members**

ARDITO Luca

BARALIS Elena Maria

BENSO Alfredo

CALIMERA Andrea

CASETTI Claudio Ettore

CHIUSANO Silvia Anna

DE RUSSIS Luigi

FOSSON Sophie

GARZA Paolo

GATTESCHI Valentina

MELLIA Marco

MICHIARDI Pietro (EURECOM)

SISTO Ricardo

REBAUDENGO Maurizio

SANCHEZ SANCHEZ Edgar Ernesto

SANNA Andrea

STERPONE Luca

TOMMASI Tatiana

TORCHIANO Marco

URGESE Gianvito

VINCO Sara

VIOLANTE Massimo

**Student representatives:**

BAROCCI Michelangelo

RIPA Francesco

*Updated every one or two years, as per current Regulations of the Acdemic Board (last updates in 2023 and 2024)*

# Research Areas, Topics and Training Programs

The PhD Programme in Computer and Control Engineering is focused on the following research areas:

- Computer architectures and CAD
- Computer graphics and Multimedia
- Control and system engineering
- Cybersecurity
- Data science, Computer vision and AI
- Life sciences
- Parallel and distributed systems, Quantum computing
- Software engineering and Mobile computing

Each student is then assigned a specific research topic, with a dedicated training program encompassing both formative and research activities

# Quality Assurance and Revision Process

Benchmarking activity at both national and international level

Consultation with the Advisory Board and internal feedback

Updating of the research areas and topics

- Verification of the consistency of research areas tackled by the PhD Programme
- Definition of specific research topics for PhD students enrolling in the Programme

Updating of the formative program

- Check on the appropriateness of the output profiles w.r.t. career opportunities
- Identification of the learning outcomes required for the expected output profiles
- Definition of the hard skill courses to be included in the formative offer of the Phd Programme (soft skills courses are defined by Scudo for all PhD Programmes)

Revision of regulations, guidelines, procedures (also for accreditation)

# External Consultation: PhD Programme Advisory Board

Fabrizio BARBERO, CSI-Piemonte
Giacinto BARRESI, Univ. West England (UK)
Niccolò BATTEZZATI, Argotec
Pandeli BORODANI, CRF - Stellantis
Giovanna CAROFIGLIO, Cisco Sys. (France)
Matteo CATTANEO, Reale Group
Gianluca CENA, CNR-IEIIT
Andrea COSENTINI, Intesa Sanpaolo
Loris DEGIOANNI, Sysdig (USA)
Gabriele ELIA, TIM
Elisa FICARRA, Univ. Modena e R. Emilia
Giulio GAMBARDELLA, Synopsys(Ireland)
Maurizio GRIVA, Reply
Michelangelo GROSSO, STMicroelectronics
Shalini KURAPATI, Clearbox AI
Patricia LAGO, Vrije Univ. Amsterdam (Netherl.)
Massimo MASSIMINO, Città di Torino
Stefano MOLINA, Unione Industriali - Torino
Alberto PISONI, DUMAREY Softronix
Giuseppe PROCACCIANTI, Dexter Energy (Netherl.)
Francesca SORO, Raiffeisen Bank Intl. (Austria)
Andrea VESCO, Fondazione LINKS

*Established in May 2023, convened periodically (last meeting held in September 2024)*

# Internal Consultation

## Collection of PhD students' feedback

- Questionnaire administered by Politecnico di Torino at the end of each year (firstly administered at the end of 2023)
- Organized meetings with all PhD students aimed at updating PhD students on discussions being made at Scudo and/or at the Academic Board/DAUIN level, gathering feedback about possible issues, needs, actions to be implemented, etc. (last meetings held on March 2024 and October 2024, next one planned around April 2025)
- Interactions with/Actions by student representatives
- Outcomes presented to/discussed in/brought to the attention of the Academic Board/DAUIN/Scudo

# PhD Programme
# Committees & Working Groups

**Quality** Committee

- Prof. P. Garza, Prof. F. Lamberti, Prof. G. Marchetto, Prof. A. Sanna, Prof. M. Torchiano

**Rationalization of procedures and tools** Committee

- Prof. A. Benso, Prof. M. Mellia

**Awards and incentive guidelines** Committee

- Prof. E. Baralis, Prof. G. Marchetto, Prof. L. Sterpone, Prof. T. Tommasi

**Education** Committee

- Prof. P. Garza, Prof. S. Vinco

**Awards and honors** Committee

- Prof. M. Rebaudengo, Prof. L. De Russis, Prof. M. Torchiano

**Research** Committee

- Prof. L. Ardito, Prof. V. Gatteschi, Prof. G. Marchetto, Prof. E. Sanchez, Prof. G. Urgese

# PhD Programme
# Committees & Working Groups

**Communication and events** Committee

- Prof. A. Calimera, Prof. S. Fosson, Prof. V. Gatteschi

**Data** Committee

- Prof. L. Ardito, Prof. G. Urgese

**Regulations** Working group

- Prof. T. Cerquitelli, Prof. G. Marchetto, Prof. P. Montuschi, Prof. D. Regruto Tomalino, Prof. L. Sterpone, Prof. R. Sisto

**Selection** Committee (40th cycle)

- Prof. C. Casetti, Prof. S. A. Chiusano, Prof. M. Violante

**DAUIN PhD Day** Working group (2024)

- Dr. A. Cannavò, Dr. A. Ruospo, Dr. F. Valenza

# Supervisor/Co-Supervisors

"The Academic Board provides each doctoral candidate with a research topic and with an academic supervisor who supervises his/her doctoral education, as well as with one or more co-supervisors

The Supervisor, assisted by one or more Co-supervisors, is responsible for:

- Guiding and assisting the doctoral candidate in the definition of his/her study plan, also with the support of the Declaration of Intent (DoI)
- Monitoring the availability of sufficient funds and equipment to carry out the research activity included in the educational project proposed to the doctoral candidate;
- Helping the doctoral candidate to choose the external teaching activities and off-site activities, verifying that they are in line with his/her educational project;

*From "Politecnico di Torino: Regulations for doctoral programmes, December 22, 2023"*

# Supervisor/Co-Supervisors

- Supervising the entire educational path, being the doctoral candidate's focal point within the Academic Board and being responsible for the research activities and progress of the doctoral candidate as well as for his/her compliance with the ethical principles of the international scientific community and the Code of Ethical Conduct of the University
- Providing a report and an evaluation to the Academic Board which constitute the basis for admitting the doctoral candidate to the following year of the programme or to final exam
- Reporting in writing any critical situations to the Coordinator, including any unjustified absence of the doctoral candidate; the Coordinator must inform the Academic Board, which may decide on the forfeiture of the doctoral candidate even during the course of the year"

*From "Politecnico di Torino: Regulations for doctoral programmes, December 22, 2023"*

# Declaration of Intent (DOI)

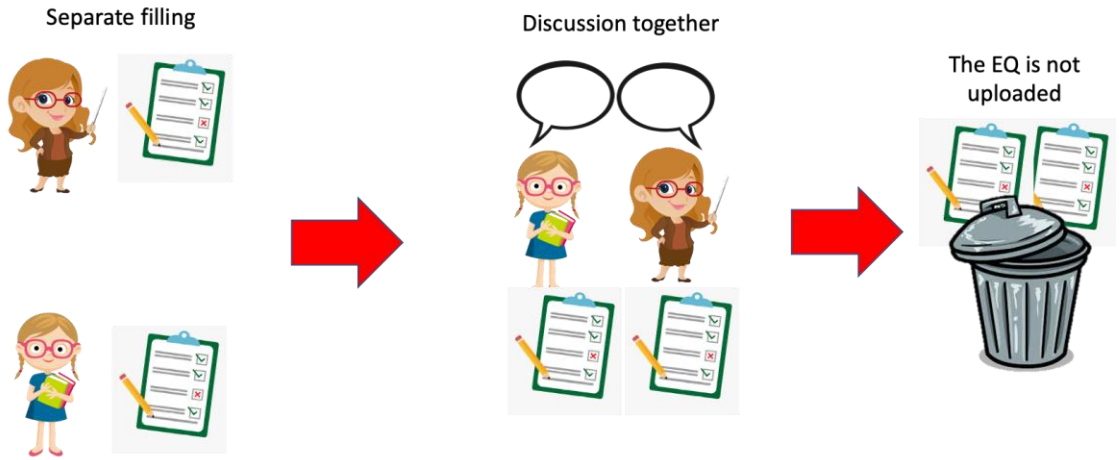
In order to support the doctoral candidate in the planning of his/her study plan and to facilitate discussion, the cupervisor and the co-supervisor(s) must sign the Declaration of Intent (DoI) with the PhD student as soon as possible and, in any case, within the first six months of activity, updating it, if necessary, at the beginning of the next two years.

Through this document, supervisor/co-supervisor(s) and the PhD student share and agree on the principles and organization of the activities

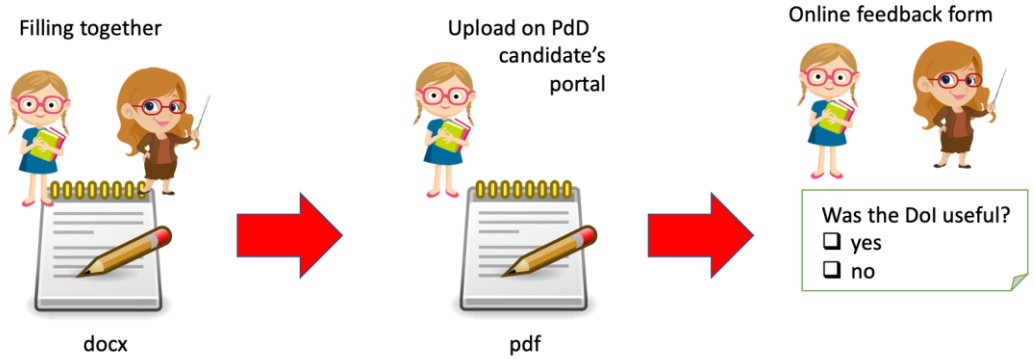
*From "Politecnico di Torino: Regulations for doctoral programmes, December 22, 2023"*

# Declaration of Intent (DOI)

**Phase 1: Expectation Questionnaire (EQ) discussion**




**Phase 2: Declaration of Intent (DoI) filling**

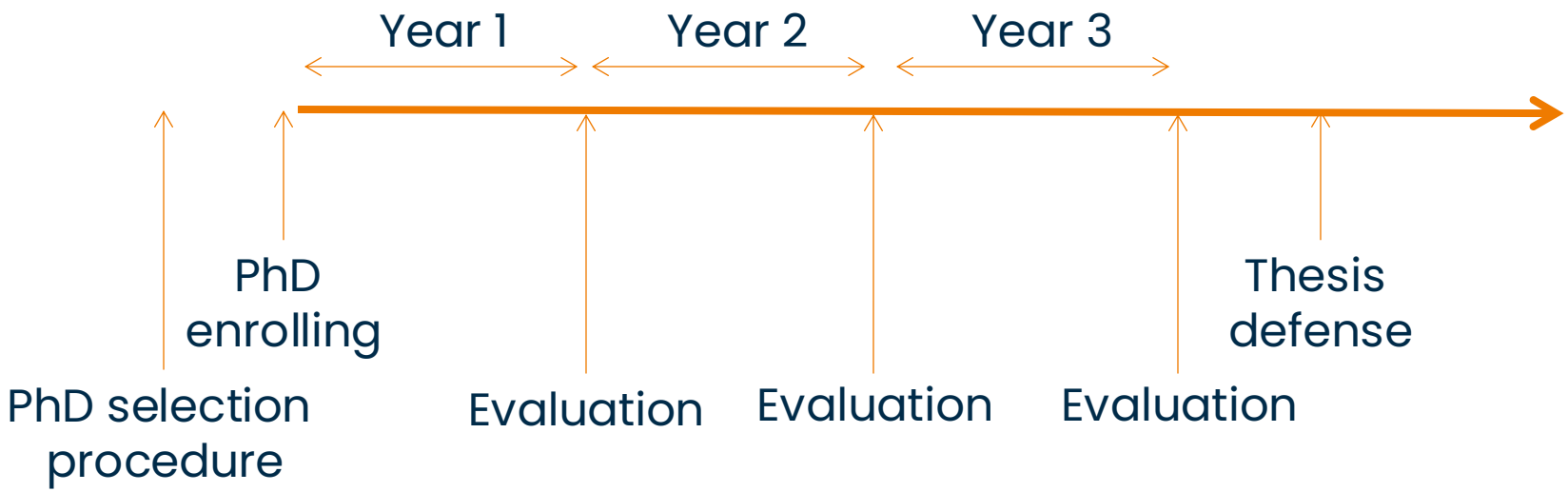



**Expectation QUESTIONNAIRE**

Read each of the statements below and then assess your position. For example with statement P1, if you believe very strongly that it is the supervisor's responsibility to select a good topic you should tick '1'. If you think it is solely the PhD candidate's responsibility to select a topic, tick '4'.

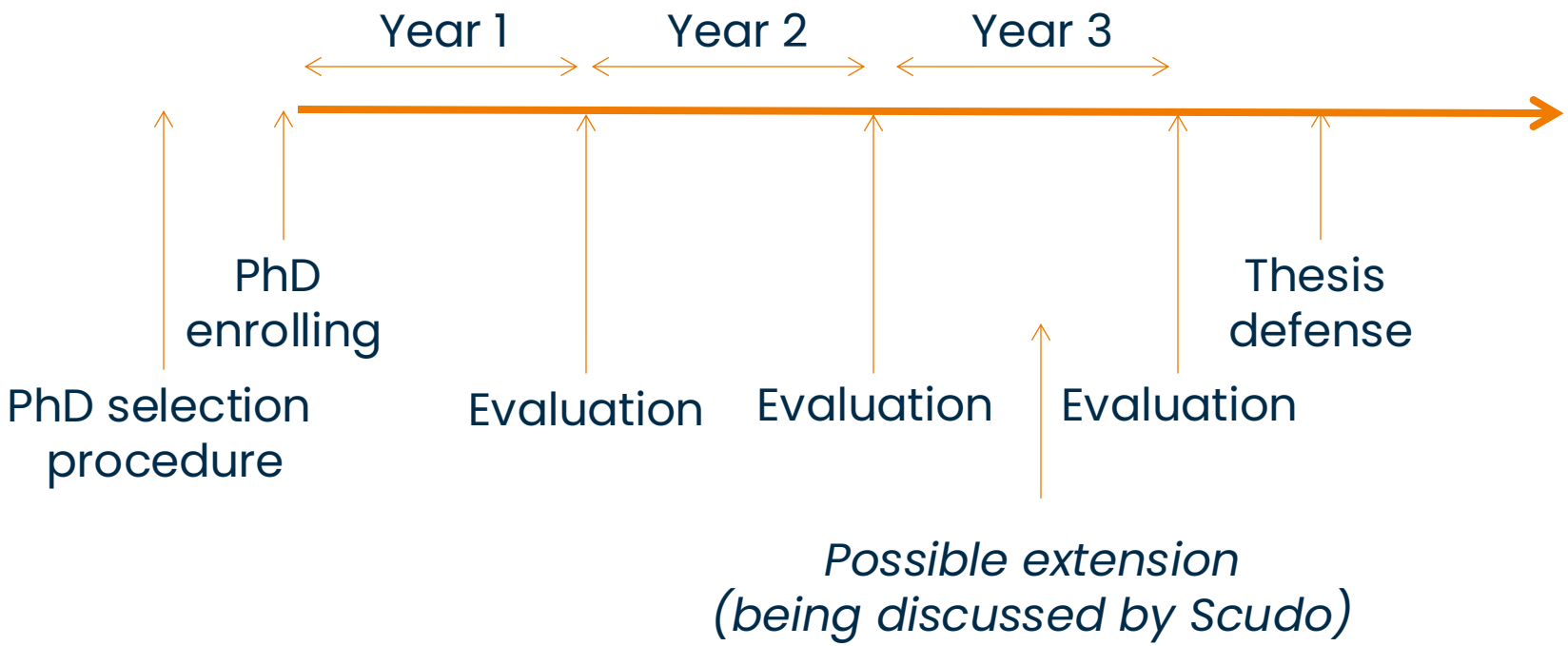
| | | | | | | |
|---|---|---|---|---|---|---|
| P1 | It is the supervisor's responsibility to select a research topic | 1 | 2 | 3 | 4 | The PhD candidate is responsible for selecting their own topic |
| P2 | The supervisor defines which theoretical framework or methodology is most appropriate | 1 | 2 | 3 | 4 | The PhD candidate defines which theoretical framework or methodology they wish to use |
| P3 | The supervisor decides the organization of the research into tasks and short-term objectives for the PhD candidate | 1 | 2 | 3 | 4 | The supervisor leaves to the PhD candidate the organization of the research into tasks and short-term objectives. |
| P4 | The supervisor defines deadlines and milestones for the research program | 1 | 2 | 3 | 4 | The PhD candidate proposes deadlines and milestones for the research program |
| P5 | The supervisor plans day-by-day work for the PhD candidate | 1 | 2 | 3 | 4 | The PhD candidate plans day-by-day their own work to match deadlines |
| P6 | The supervisor drives the collaborations with other components of the research group or other researchers | 1 | 2 | 3 | 4 | The PhD candidate is free to start the collaborations with other components of the research group or other researchers |
| P7 | The supervisor manages the available budget and other costs related to research | 1 | 2 | 3 | 4 | The PhD candidate takes decisions on the use of the available budget and on other costs related to research |
| P8 | The supervisor develops an appropriate training program for the PhD candidate | 1 | 2 | 3 | 4 | The PhD candidate develops his training program on his/her own |
| P9 | The supervisor plans and organizes secondments (e.g., periods abroad, Erasmus) for the PhD candidate | 1 | 2 | 3 | 4 | The PhD candidate plans and organizes secondments (e.g., periods abroad, Erasmus) autonomously |
| P10 | The supervisor is responsible for ensuring that the PhD candidate is introduced to the appropriate services and facilities of the department and university | 1 | 2 | 3 | 4 | The PhD candidate is responsible for finding and getting access to all the relevant services and facilities of the department and university |
| P11 | The supervisor plans regular meetings and checks progress with the PhD candidate. | 1 | 2 | 3 | 4 | The PhD candidate decides when they want to meet with the supervisor to discuss progress |
| P12 | The supervisor provides personal counseling | 1 | 2 | 3 | 4 | Personal counseling is not the responsibility of the supervisor |
| P13 | In addition to guidance/advice, the supervisor plays a major contribution in working out the candidate's research tasks (e.g.: literature review, analysis, experiments, data collection, writing...). | 1 | 2 | 3 | 4 | The PhD candidate complete their research tasks autonomously. The supervisor provides guidance/advice and feedback with no direct contribution to the work. |
| P14 | The supervisor checks all the research documents and outcomes before release | 1 | 2 | 3 | 4 | The PhD candidate submits research documents and outcomes to the supervisor only when they want constructive criticism |
| P15 | The supervisor assists in the writing of the thesis if necessary | 1 | 2 | 3 | 4 | The writing of the thesis is only the PhD candidate's own work |
| P16 | The supervisor is responsible for decisions regarding the quality level of the publications and the thesis | 1 | 2 | 3 | 4 | The PhD candidate is responsible for decisions regarding the quality level of the publications and the thesis |

# PhD Path




*From the 39th cycle at least two starting dates, i.e., November 1st and March 1st* (plus some exceptions, e.g. PNNR, DM, …)

# PhD Path




*From the 39th cycle at least two starting dates, i.e., November 1st and March 1st* (plus some exceptions, e.g. PNNR, DM, …)

# Evaluation (Yearly Review)

At (some weeks before) the end of each year, the PhD student is invited to:

- Upload a PPT report on performed activities on an ad-hoc web site (PhDMAN)
- Present them, as well as the plan for the future activities, to one of the established Evaluation Committees (three reviewers each)
- His/her report and presentation will be reviewed by the Committee, which will submit its comments (public and private)
- The supervisor will also be asked for an evaluation on student's activities
- The Academic Board will take the final decision about admission to the following year (or the final exam)
- Both the Academic Board and Scudo decided some minimum requirements for the admission to the following year (or the final exam)
- Additional, intermediate reviews may be required based on the yearly review

# Regulations

PhD students must comply with both

- the Academic Board's regulations
- Politecnico di Torino/Scudo's regulations

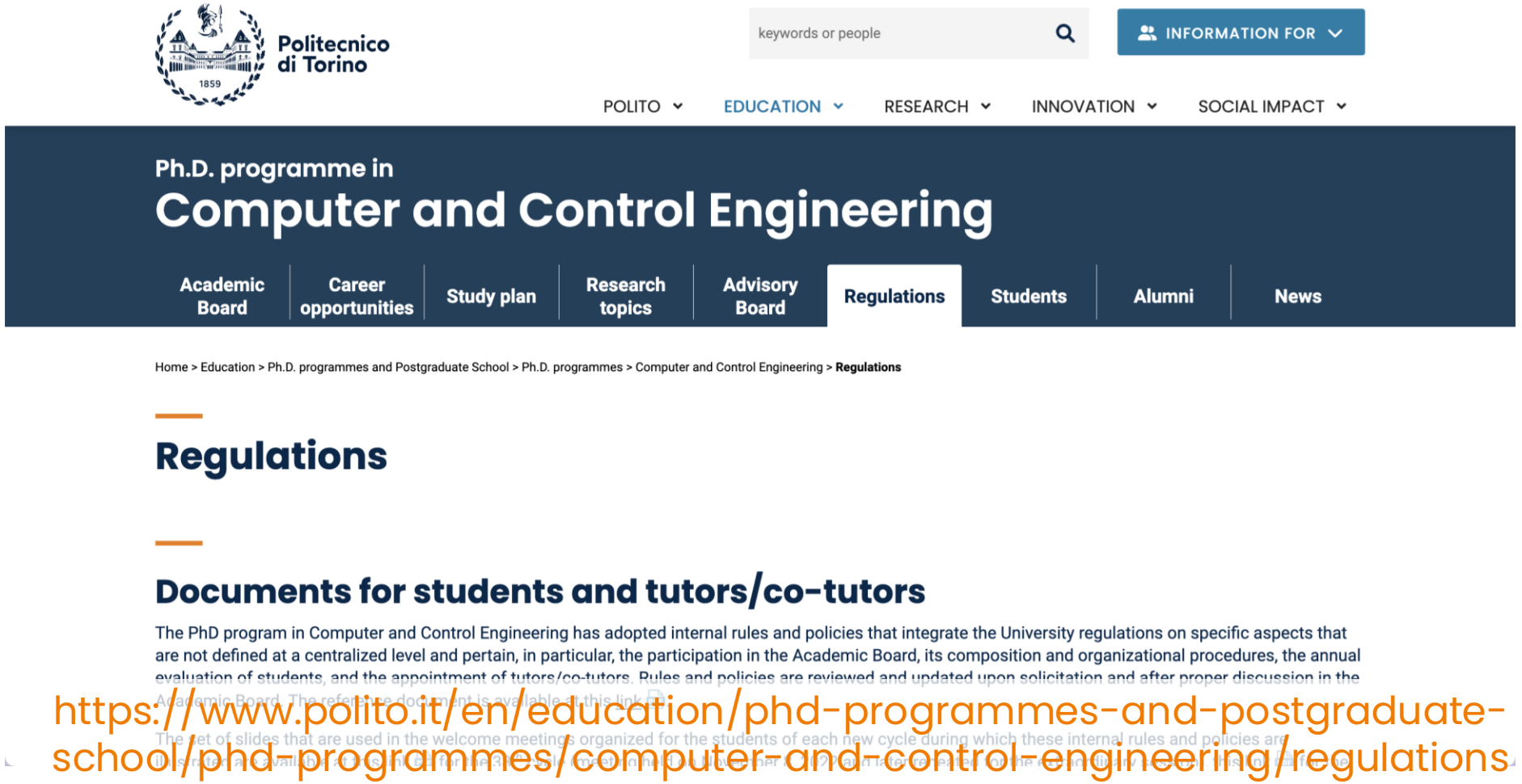
# PhD Programme in Computer and Control Engineering's Regulations

Revision of the Regulations of all PhD Programmes in progress to align, at Politecnico di Torino's level, with national PhD regulations (from 38$^{th}$ cycle)

For the PhD Programme in Computer and Control Engineering

- Process has being handled by the Regulation Working Group
- Aim has been to describe what was spread on multiple documents, taking the opportunity to cope with feedback from internal/external consultation
- The new document has been shared with the Academic Board, the discussion has been opened to the Department (professors/researchers, PhD students)
- The version approved by the Academic Board has been presented to the Board of the Doctoral School, which approved it
- This document continuing its path in the other Boards of Politecnico di Torino
- For the time being, the previous version (and related docum.) shall be considered

# PhD Programme in Computer and Control Engineering's Regulations




https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/phd-programmes/computer-and-control-engineering/regulations

# Politecnico di Torino/Scudo's Regulations (and Welcome Meeting)

Politecnico di Torino regulations can be found on Scudo's website

A separate welcome meeting for all PhD students enrolled in the third sessions of 40$^{th}$ cycle has been organized by Scudo

- Focus has been on PhD life at Politecnico di Torino and Scudo's regulation

# Politecnico di Torino/Scudo's Regulations (and Welcome Meeting)


https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/the-doctoral-school/regulations

# Evaluation Process

## PhD Program in Computer and Control Engineering
### Review Process

The yearly review process of PhD students enrolled in the program is organized in steps.

Yearly report preparation → Public presentation → Review → Final decision

Each student will receive during the year email reminders with the deadlines for each step.

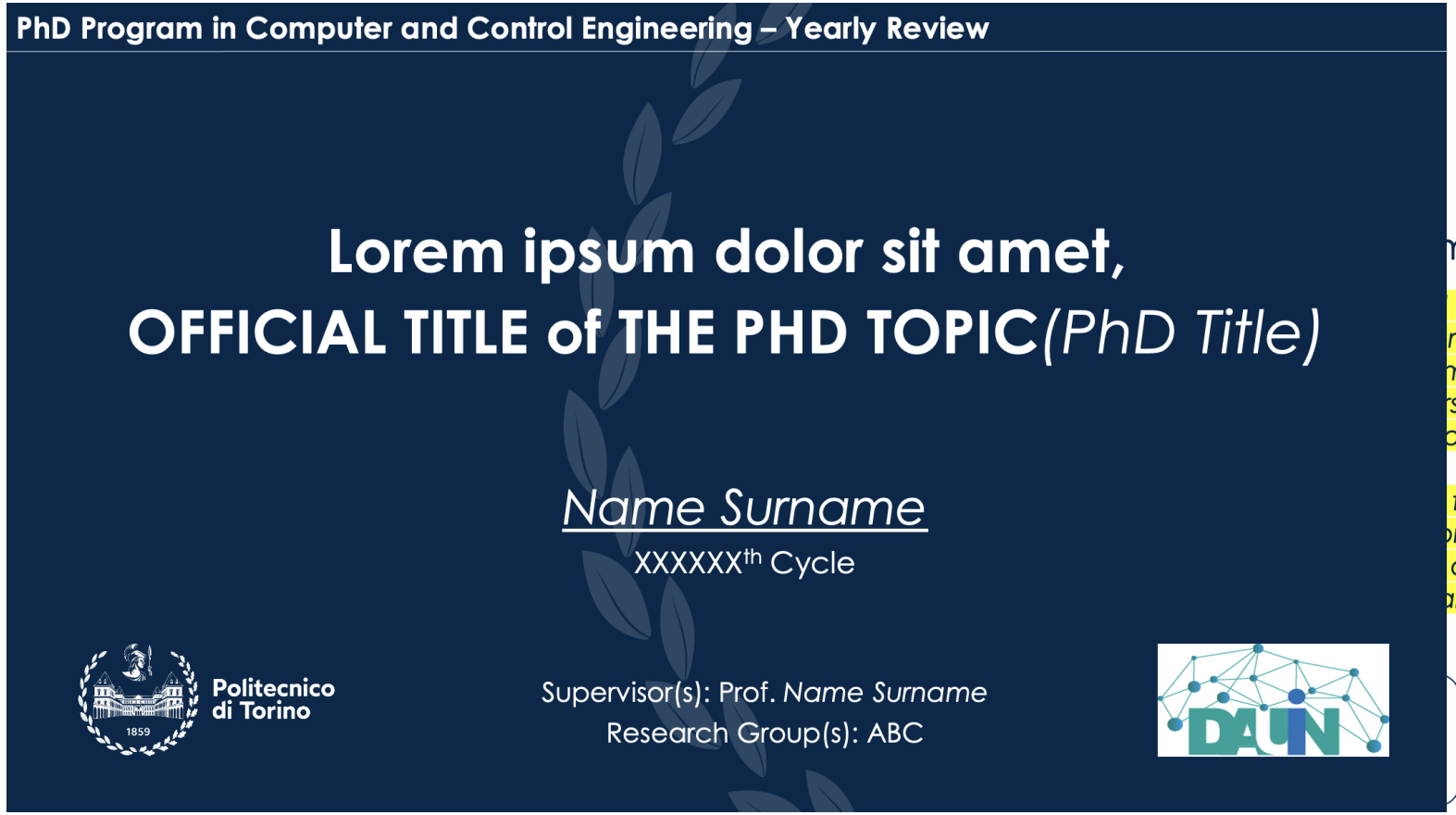
| | |
|---|---|
| **Yearly report preparation** | The yearly report must be a Power Point presentation that MUST follow the template below:<br>• Research:<br>  ○ Topic: 1 slide<br>  ○ Results: max 15 slides that highlight the student personal contributions, with a particular focus on current year<br>  ○ Next steps: 1 slide<br>• Teaching (1 slide):<br>  ○ Complete study plan agreed with the tutor, including the list of hard skill and soft skill courses (recognized hours/grades, in-house/off-site) attended and planned for the three years<br>  ○ List of taught courses (with CPD evaluations)<br>  ○ Other activities<br>• Other results (1-2 slides):<br>  ○ Publication list, with a clear indication of those referring to current year<br>  ○ Participation to conferences (as attendee/presenter) |

# Evaluation Report: Content

## Requires the PhD student to provide information about (template):

- Basic info (name, title, tutor/co-tutors, etc.)
- Description of the research topic, scenario, motivations
- Description of the activities performed (current year and overall) in terms of state of the art, idea, methodology, contributions, as well as results, conclusions, future work
- Description of next steps
- Teaching delivered (including the CPD evaluation received)
- Training activities (e.g., attended courses, schools, etc.)
- Publications (as recorded in IRIS)
- Participation in conferences and other dissemination activities
- Participation in research projects
- Time spent in research institutions different than POLITO
- Involvement in the international research community (e.g., role as reviewer, program committee member, etc.)
- Achievements (e.g., awards or recognitions)

# Evaluation Report: Template

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# Publication Requirements

The PhD student must obtain:

- At least one publication accepted for publication in an international conference with peer review or in an international journal for every year
- One indexed publication
  - Accepted for publication in an international journal (Scudo's requirement)
  - Which is ranked Q1 or Q2 by Scopus or WoS (Academic Board's requirement)

# Requirements on Publications

It is important to plan properly, considering the time of review processes, noting also that, as per Scudo's rules

- Only the journals listed either in the Scopus or WOS repositories will be considered
- Conference papers published as they are in journals (e.g., LNCS, Procedia) are not considered as journal papers
- Only publications appearing in the official repository of Politecnico di Torino (IRIS) will be considered (and shall to be inserted therein as soon as acceptance notification is received)
- Only publications after January 1, 2025 will be considered (for students who started the PhD on November 1, 2024 or March 1, 2025)
- If you coauthor a journal publication with other *n* PhD students, its weight is divided by *n+1* (and Scudo consider authors as students for several months after they ended their PhD)

# Requirements on Publications

# Requirements on Courses

The PhD student must attend courses

- For a minimum of 140 hours, 100 hours of hard skills and 40 hours of soft skills
- To be agreed with the supervisor at the beginning of the 1st year (study plan)
- At least 60 hard skill hours shall be selected from the offer of the PhD Programme in Computer and Control Engineering (from 39th cycle)

Scudo will enforce the achievement of required hours by the 3rd year

However, at the end of each year, the Evaluation Committee will judge

- Whether the PhD student attended enough courses (the Academic Board recommends the students to complete half of the hours in the 1st year, the other half by the end of the 2nd year)
- Whether these courses are coherent with his/her research topic

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Catalogue of hard skill courses in the formative program of the PhD Programme managed/updated by the Academic Board

Periodic checks on coherence and sustainability:

- Number of students/passes per course
- Coverage of the research areas
- Internationalization and external connections
- Inter-, multi-, and trans-disciplinary aspects, balance of transversal/special. courses

Invited courses (previously “excellence”) added a later time, based on Scudo calls and received proposals

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Other aspects considered in the revision activities aimed at the definition of the offer for the 40th cycle

- Submission of course proposals by the potential professors ("bottom-up"), evaluation/decision by the Academic Board
- Requests coming from PhD students
  - Richer and more coherent catalogue
  - Ensure stability of the offer from one cycle to the other
- Internal/External push for a wider internationalization/aperture towards external context and stronger involvement of companies
- Suggestions received by the Advisory Board regarding relevant topics that could be included in the offer of the previous cycle/year
- Goal of keeping roughly the number of courses of last cycle/year

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Advanced data structures in Python 1|2

Artificial Intelligence Safety 1|2 EXTERNAL

Computational Systems Biology 1|2 NEW COURSE

Data mining concepts and algorithms 1|2

Designing for Mindful Human-Computer Int. 1| NEW COURSE

Digital Twin Modeling and Integration for Multidisciplinary Research 1|2 NEW COURSE

Empirical research methods 1|2 HOURS

Extended Reality 1|2 EXTERNAL

Formal verification of concurrent and distributed software and systems 1| NEW COURSE

High-Level Synthesis 1| EXTERNAL

High Performance Computing (HPC) - From Space to Grounds 1| TITLE

How to trust your chip: Design-for-Test for Complex SoCs |2 TITLE, HOURS

Human-AI Interaction |2

Information and communication technologies for industry and automation 1|2 NEW COURSE , EXTERNAL

Information visualization and visual analytics |2

Learning linear and nonlinear feedback controllers from data: theory and comp. |2

Machine learning in healthcare: From theory to practice 1|2 HOURS, EXTERNAL

Machine learning for pattern recognition 1|2

Mimetic learning 1|2

Natural Language Proc. based on Deep Learning 1|2, HOURS, EXTERNAL

Neuro-symbolic artificial intelligence 1|2

Optimized Execution of Neural Networks at the Edge and Neuromorphic Computing System 1|2 TITLE, HOURS

Parallel and distributed computing 1|2

Quantum computing 1|2

Reconfigurable computing 1|2

Reinforcement learning methodologies and control system applications 1| NEW COURSE

Security and privacy for Digital Identity Frameworks |2

Security of next generation networks 1|2 EXTERNAL

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Each course has been assigned to one or more research areas

With minimum 2, maximum 8 courses per area

- Computer architectures and CAD (5)
- Computer graphics and Multimedia (3)
- Control and system engineering (3)
- Cybersecurity (3)
- Data Data science, Computer vision and AI (8)
- Life sciences (2)
- Parallel and distributed systems, Quantum computing (5)
- Software engineering and Mobile computing (3)

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Summary of the revisions:

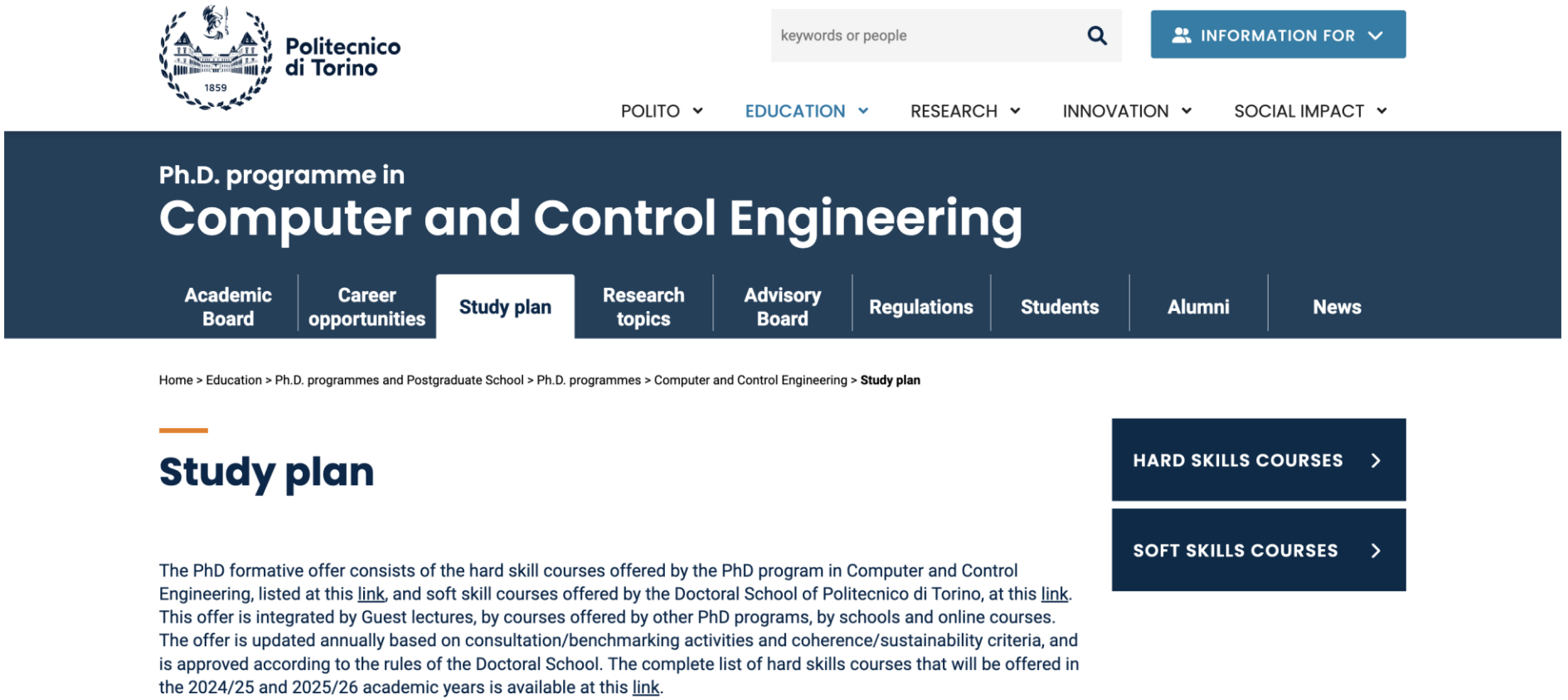
- Total number of courses from 22 in A.Y. 2023-24 to 28 in A.Y. 2024-25 and 2025-26 (and calendarization over two years)
  - Some courses active only in one of the two A.Y., some in both
  - In each A.Y., 23 different courses
- Some research areas, like e.g., Life sciences as well as Control and System engineering, passed from 1 to 2 courses
- External teachers/Companies involved in 7 courses compared to the 2 courses of the previous cycle/year (1 responsible)
  - CNR, NVIDIA, PoliMI, Spotify, TU Wien, University of Limerick

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Three invited coursed approved by Scudo, complementing 2024-25 offer

- Citizen Science: Empower data crowdsourcing and pervasive technologies for social good
  - Proposed by: Luigi De Russis
  - Lecturer: Catia Prandi, ITI-LARSyS (Portugal), Univ. Bologna
- Hardware/Software codesign of flexible computing systems for edge AI
  - Proposed by: Daniele Jahier Pagliari
  - Lecturer: Angelo Garofalo, ETH Zurich (Switzerland), Univ. Bologna
- Quantum Machine Learning: Quantum and Hybrid Algorithms
  - Proposed by: Bartolomeo Montrucchio
  - Lecturer: Mohammad Ghazi Vakili, University of Toronto (Canada)

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26




https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/phd-programmes/computer-and-control-engineering/study-plan

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

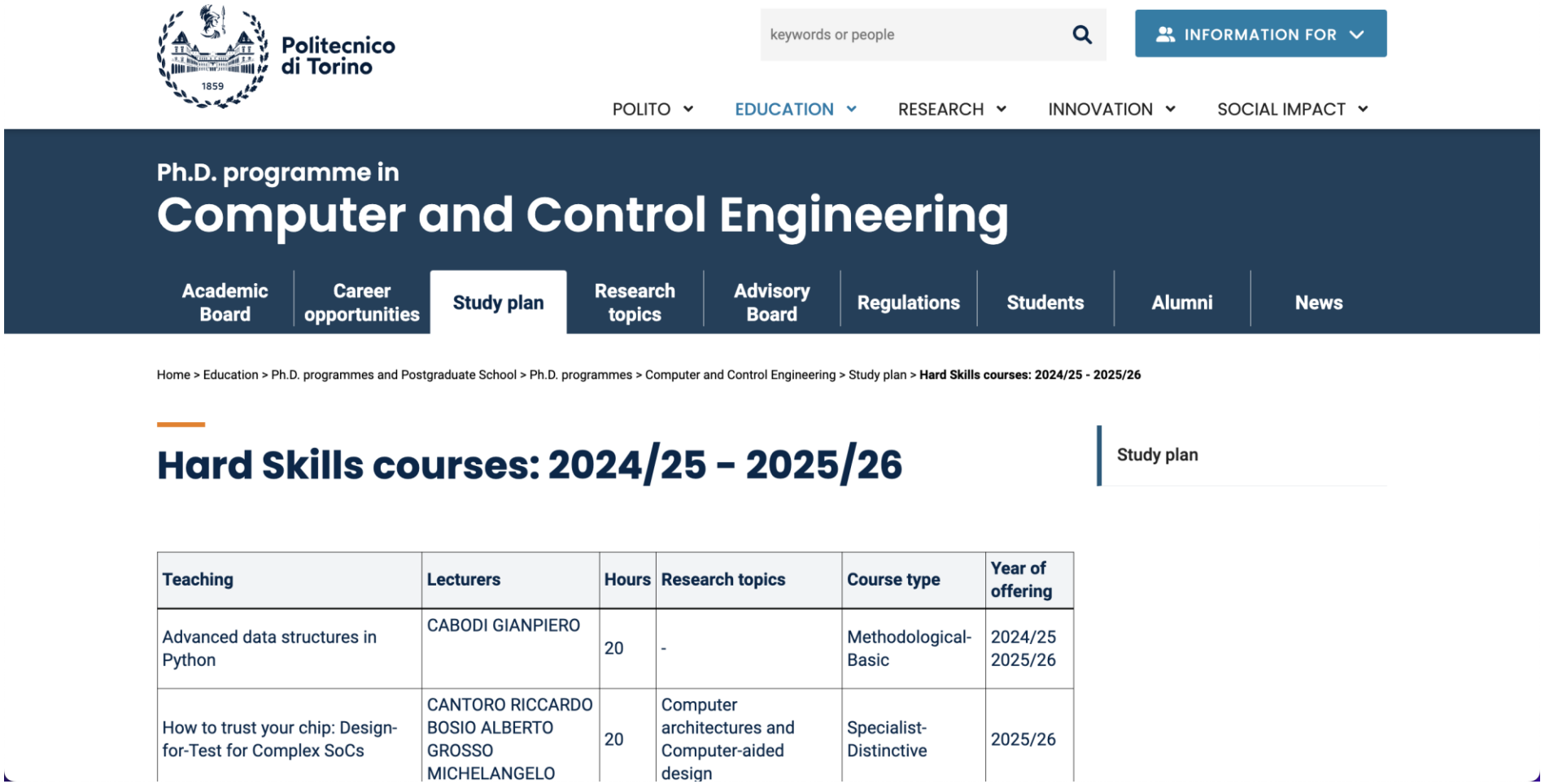
Politecnico di Torino

POLITO | EDUCATION | RESEARCH | INNOVATION | SOCIAL IMPACT

## Computer and Control Engineering

| Code | Teaching | Hours | Language |
|---|---|---|---|
| 01HWMIU | Advanced data structures in Python | 20 | |
| 01HWFIU | Artificial Intelligence Safety | 20 | |
| 01TIHIU | Computational Systems Biology | 20 | |
| 01QTEIU | Data mining concepts and algorithms | 20 | |
| 01TICIU | Designing for Mindful Human-Computer Interaction | 20 | |
| 01TJFIU | Digital Twin Modeling and Integration for Multidisciplinary Research | 20 | |
| 01DMSIU | Empirical research methods | 30 | |
| 01HUTIU | Extended Reality | 20 | |
| 01QSBIU | Formal verification of concurrent and distributed software and systems | 20 | |
| 01SQEIU | High Performance Computing (HPC) - From Space to Ground | 15 | |
| 01TCJIU | High-Level Synthesis | 20 | |

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26



Politecnico di Torino

keywords or people

INFORMATION FOR

POLITO | EDUCATION | RESEARCH | INNOVATION | SOCIAL IMPACT

Ph.D. programme in
Computer and Control Engineering

Academic Board | Career opportunities | Study plan | Research topics | Advisory Board | Regulations | Students | Alumni | News

Home > Education > Ph.D. programmes and Postgraduate School > Ph.D. programmes > Computer and Control Engineering > Study plan > **Hard Skills courses: 2024/25 - 2025/26**

## Hard Skills courses: 2024/25 - 2025/26

Study plan

| Teaching | Lecturers | Hours | Research topics | Course type | Year of offering |
|---|---|---|---|---|---|
| Advanced data structures in Python | CABODI GIANPIERO | 20 | - | Methodological-Basic | 2024/25 2025/26 |
| How to trust your chip: Design-for-Test for Complex SoCs | CANTORO RICCARDO BOSIO ALBERTO GROSSO MICHELANGELO | 20 | Computer architectures and Computer-aided design | Specialist-Distinctive | 2025/26 |

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26

Monthly distribution over the year, coordinated by the Teaching Commitee of the Academic Board during the collection of proposals

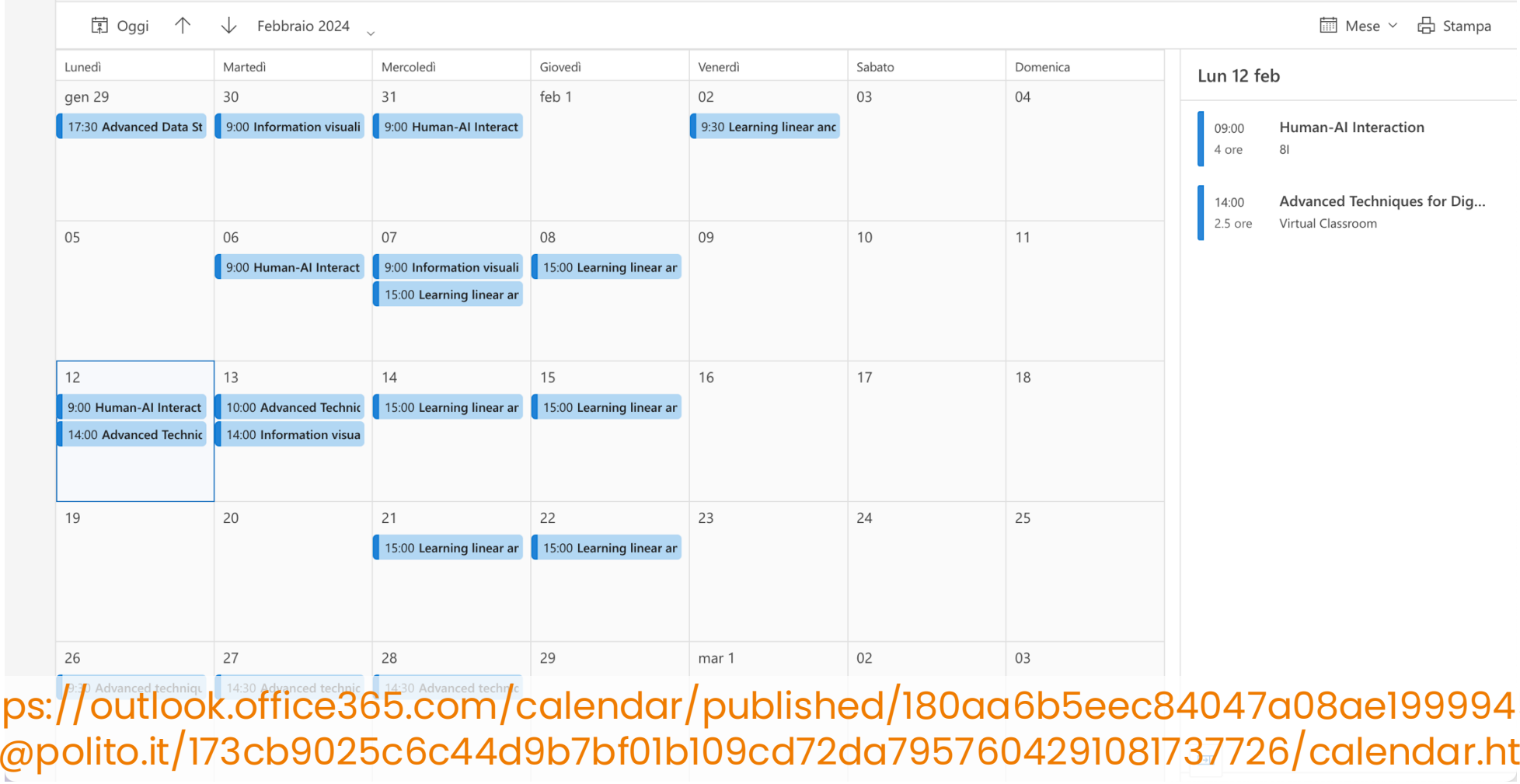
- Shared Outlook calendar
- All students invited

Full schedule defined by teachers before the start of each semester, avoiding overlaps as much as possible

## Schedule

Starting from the Academic Year 2022-23, the Academic Board adopted a unified calendar for the planning of the lectures for the hard skill courses belonging to the training offer of the PhD program in Computer and Control Engineering. Calendar is also shared using email addresses of both students and teaching staff.

# Hard Skill Courses for the 40th Cycle: Formative Offer 2024-25 and 2025-26




https://outlook.office365.com/calendar/published/180aa6b5eec84047a08ae19999451227@polito.it/173cb9025c6c44d9b7bf01b109cd72da7957604291081737726/calendar.html

# Soft Skill Courses (Scudo's Catalogue)


https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/phd-path/study-plan/soft-skills-courses

# Final Exam

The PhD student will have his/her thesis reviewed by two external referees

They will decide whether he/she will be allowed to defend it

If yes, he/she will present and discuss the thesis in front of an Evaluation Board composed of 5 people (3 from outside Politecnico di Torino), including the 2 referees

# Evaluation
# “cum Laude“

When admitting a PhD student to the final exam, the Academic Board may assign him/her an excellence score

The Evaluation Board will consider this score to possibly assign the degree “cum Laude”

The excellence score depends on various aspects (rules defined by the Academic Board)

- Number and quality of journal publications
- Awards
- Periods abroad
- Dissemination
- …

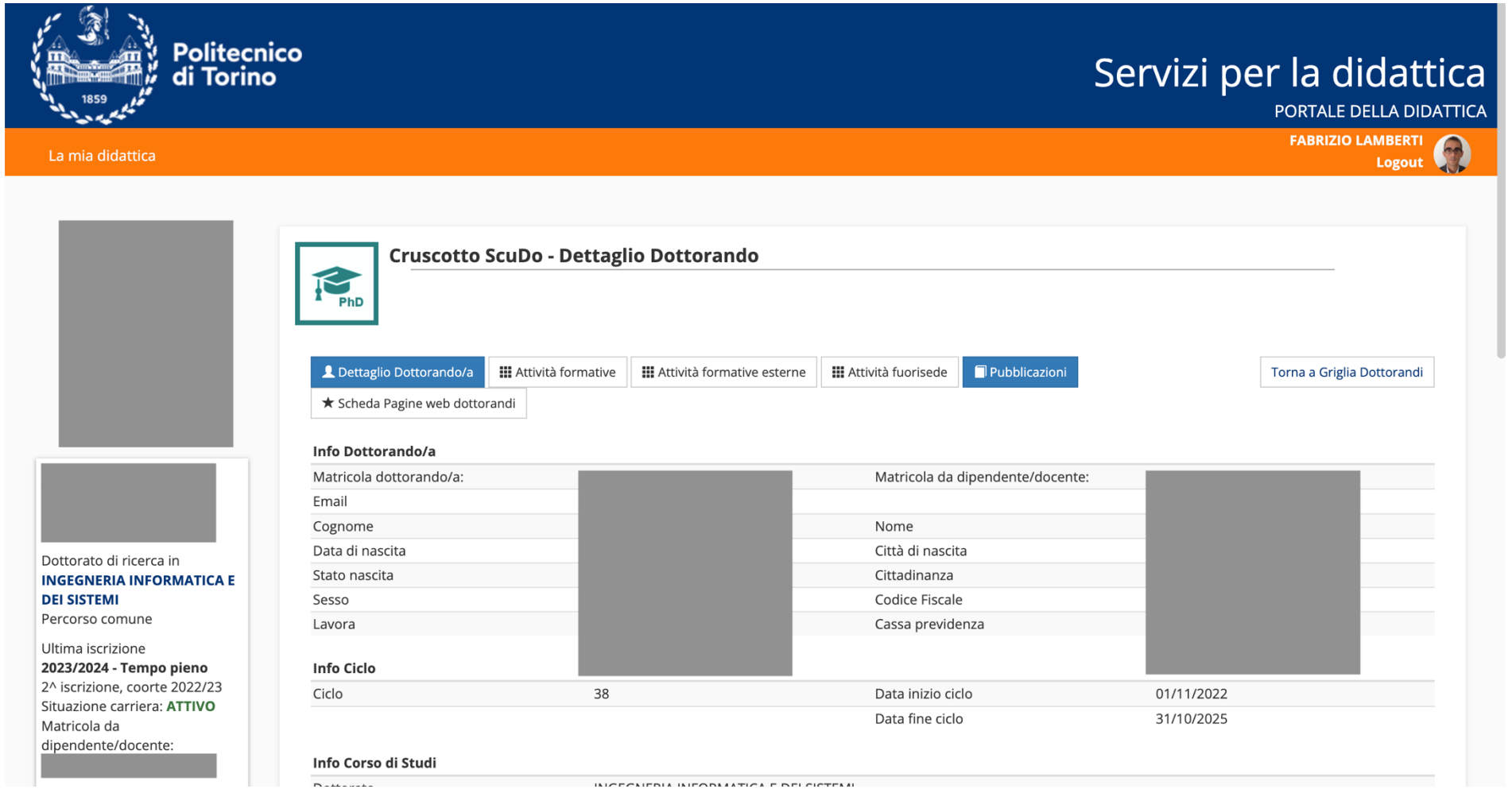
# Cruscotto

The Cruscotto is a web application managed by Scudo allowing

- PhD students to upload information about their activities and request related authorizations (publications, courses, periods outside Politecnico di Torino, etc.)
- PhD students (and supervisors) to manage their thesis/final exam procedure
- Politecnico di Torino's staff to monitor the status of each PhD student

The Cruscotto can be accessed through the Portale della Didattica

# Cruscotto


Politecnico di Torino
Servizi per la didattica
PORTALE DELLA DIDATTICA
La mia didattica
FABRIZIO LAMBERTI
Logout
Cruscotto ScuDo - Dettaglio Dottorando
Dettaglio Dottorando/a
Attività formative
Attività formative esterne
Attività fuorisede
Pubblicazioni
Torna a Griglia Dottorandi
Scheda Pagine web dottorandi
Info Dottorando/a
Matricola dottorando/a:
Matricola da dipendente/docente:
Email
Cognome
Nome
Data di nascita
Città di nascita
Stato nascita
Cittadinanza
Sesso
Codice Fiscale
Lavora
Cassa previdenza
Info Ciclo
Ciclo
38
Data inizio ciclo
01/11/2022
Data fine ciclo
31/10/2025
Info Corso di Studi
Dottorato di ricerca in
INGEGNERIA INFORMATICA E DEI SISTEMI
Percorso comune
Ultima iscrizione
2023/2024 - Tempo pieno
2^ iscrizione, coorte 2022/23
Situazione carriera: ATTIVO
Matricola da dipendente/docente:

# External Training Activities "Attività formative esterne"

SCUDO recognizes hours for external training activities too (tab "Attività formative esterne" in the Cruscotto)

- On-line courses: some rules have been defined hard skill hours by the Academic Board of the PhD Program in Computer and Control Engineering (no pre-authorization required by the Chair only for selected providers like, e.g., Coursera)
- Other external activities (e.g., summer/winter schools, …)

All these activities will be validated only if an exam has been passed

In order to have the hours recognized, the student must upload related information on the SCUDO Cruscotto, including documents stating he/she

- Attended the course/school (for a certain number of hours)
- Passed the exam

# External Research Activities ("Attività fuori sede")

If the PhD student spends any time in external research activities (required for some positions), he/she can have them recognized by SCUDO (tab "Attività fuorisede" in the Cruscotto)

The procedure for recognition requires

- The approval by the Chair before the departure
- The uploading of a report by the student after the student returns
- The validation by the Coordinator (he receives bulk validation requests weekly)

Only start and end dates of the activity are acceptable (travels excluded)

The whole procedure must be performed through the Cruscotto

If the activity is performed outside Italy, the student gets a 50% increase of the scholarship for the corresponding period (may not apply to all positions)

# Travels ("Missioni")

When a PhD student has to travel (e.g., to attend a conference, etc.), he/she must preliminarily ask for a permission, filling an on-line form through the MyPoli website (at least 7 working days before the departure date)

After his/her request

- The owner of the money the student will travel with must approve the travel
- The DAUIN administration will check whether the specified money is eligible for this purpose
- The Coordinator will finally approve the request

This request concerns money, insurance aspects, etc.

The PhD student must also submit the authorization request through the Cruscotto (it is a separate request, needed for the recognition of activities, getting the 50% scholarship increase, etc.)

# Money

The economical support for the PhD student activities (e.g., for equipment, travels, publications, etc.) is in charge to the supervisor/group

# Mobility and Available Resources

Experiences outside Politecnico di Torino (either in industry, or in other universities/research centers in Italy, or abroad) are an important part of the PhD training, and represent a key element in the CV of any researcher

- Several scolarships mandatorily request students to spend 6 months abroad and/or 6 months in a company, university/research center, or public admin.
- Starting from the 38$^{th}$ cycle, each scholarhsip is associated a mobility budget equal to 1.885,45 € per year (budget is assigned to/provided by the Supervisors, and cumulates, students should refer to them whenever needed)
- Scholarships include also a 50% increase for (long) mobility period abroad
- Every year, the Academic Board redistributes mobility budget not spent by students from the last closed cycle to current/new students (budget is assigned to the Supervisors, who can use it for their active PhD students when/as needed)
- DAUIN decided to support when the (long) mobility costs are on Supervisors
- Some additional support means are being discussed at Politecnico di Torino's level

# Teaching Activities

PhD students are invited to contribute to courses as teaching assistants

Active teaching is considered as one of the ways PhD students are expected to gain/improve their ability to learn and trasfer knowledge

- As such, teaching is part of the training programme for a PhD student, it is checked in the yearly evaluations, and is also considered in other ways

Students receive extra-money for this activity (max 60 hours, additional hours need to be authorized by the Coordinator)

Courses are assigned by a Committee of DAUIN after consultation with the course lecturer, the Supervisor, the student, etc.

- Assignments are made far in advance, hence students should let the Supervisor and/or the Committee know about preferences/needs as soon as possible
- The Committee is responsible for guaranteeing a balanced distrib. over the students

# Quality Awards

Starting from 2015, several so-called Quality Awards have been established to recognize the best PhD students

- At the end of the path (2500€), 3 awards last year
- At the end of the 2nd year (1200€), 8 awards last year

General rules defined by Scudo, further specified by the Awards and incentive guidelines Committee of the Academic Board (the Awards and honors Committee, then decides on assignments), considering, e.g.,

- Publications
- Periods abroad
- Participation to projects and dissemination events
- Teaching activities
- Awards
- …

# Quality Awards

Beneficiaries of the 2024 awards for the 2nd year (37th cycle):

- AMPRIMO Gianluca (1st)
- ANGI Antonino (2nd)
- BERTON Gabriele Moreno
- DRI Emanuele
- FULCINI Tommaso
- MONACO Simone (3rd)
- RANDO MAZZARINO Pietro
- RISSO Matteo

Beneficiaries of the 2024 awards for the 3rd year (36th cycle):

- DAGHERO Francesco (1st)
- PLIZZARI Chiara (2nd)
- GUERRERO BALAGUERA Juan David (3rd)

# Key Points

1 publication each year (conference/journal), 1 Journal (Q1/Q2) by 3rd year

100h hard skills (min. 60 from PhD Programme offer), 40h soft skills

Teaching as course assistant, 60h/year max. (paid)

Report and oral presentation every year

DOI

Questionnaire

Awards

Events

Tools/References: Cruscotto, supervisor, Coordinator, DAUIN, Scudo

# Meetings/Events

Meetings/Events organized by Scudo, PhD Programme and DAUIN

- Welcome meeting with new PhD Students (beginning of each cycle/session)
- Meeting on final exam (end of third year, typically mid/end November)
- DAUIN PhD Day (typically at the beginning of November)
- Informal meetings (March 12, 2024, October 18, 2024, …)
- Other (workshops, talks, e.g., organized by students, on proposal, by professors, etc.)

# DAUIN PhD Day 2024

Last edition on November 6, 2024

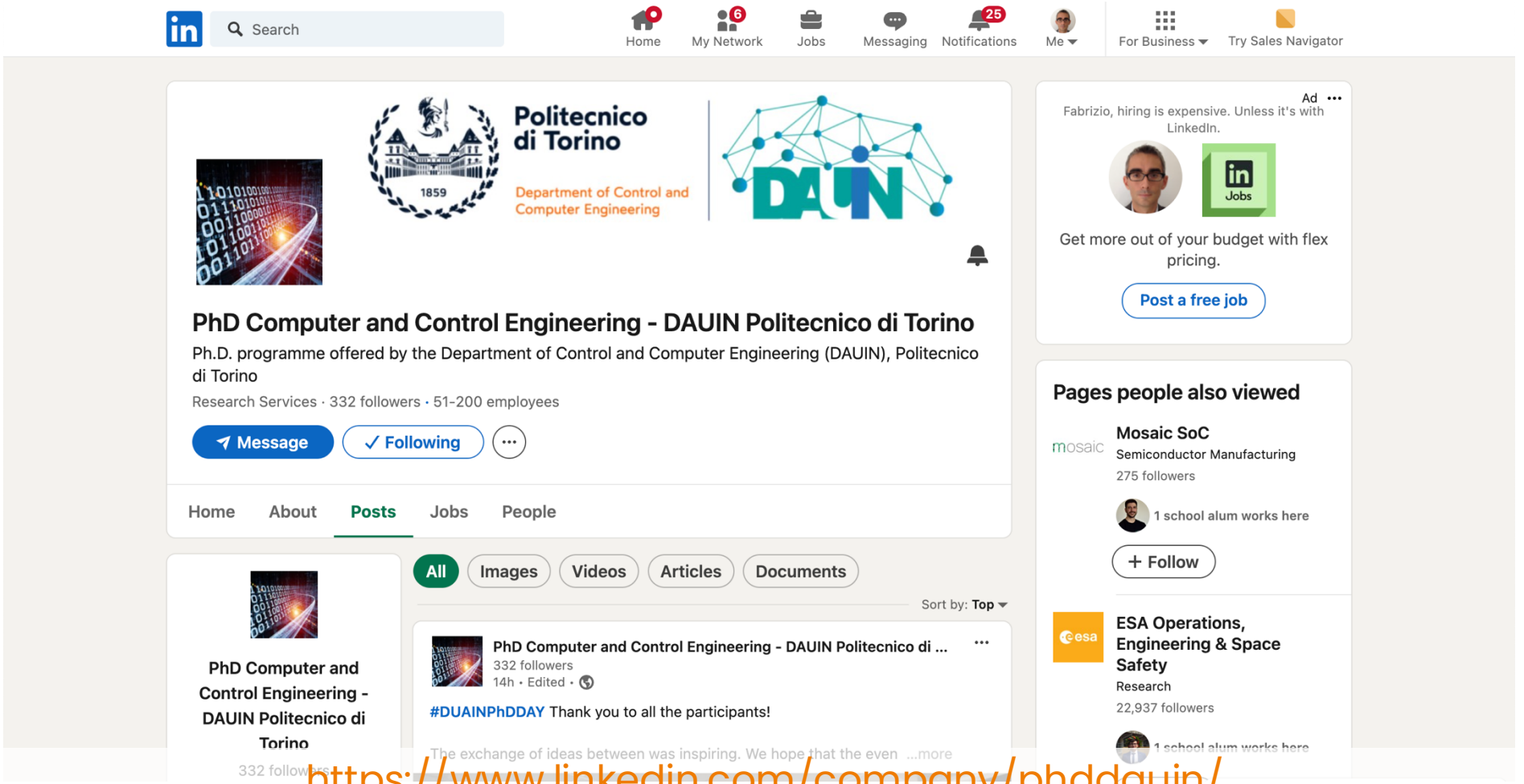
- Phd students completing the 2nd and 3rd year present, in an event organized at DAUIN, the state of their research to other students, professors/ researchers and guests from companies, research centers, etc. with posters and demos


https://www.polito.it/en/education/phd-programmes-and-postgraduate-school/phd-programmes/computer-and-control-engineering/news/events/dauin-phd-day-2024

# Internal/External Communication

- Website of the PhD Programme
- SharePoint area (for student representatives, with minutes of Academic Board meetings)
- LinkedIn page of the PhD Programme
- Webpages of PhD students (linked to Politecnico di Torino main site)

# LinkedIn Page of the PhD Programme in Computer and Control Engineering




https://www.linkedin.com/company/phddauin/

# Google Scholar and LinkedIn

PhD students are requested to own:

- A Google Scholar account
- A LinkedIn account

PhD students are also requesed to follow/join the

- LinkedIn page of PhD Programme in Computer and Control Engineering

All the students of the 40th cycle (third session) must send the corresponding links to dauin.dottorato@polito.it by March 31, 2025 writing «DAUIN PhD Scholar/LinkedIn links» in the subject

# Student's Personal Webpage

PhD students are requested to keep their personal webpage up-to-date

- Research interests: dropdown list, with the eight research topic of the PhD Programme/the Department
- Research topic: title of the research (at the beginning of the path) or of the thesis (at the end of the path)
- Biography: title and year of your MS degree, research group, domain and goals of your research activities (ask your supervisor), etc., max 500 words
- Poster: the same used for the PhD Day
- Link video YouTube: the video file prepared for DAUIN PhD event (or the video created for the quality awards)

Page needs to be populated and approved by the supervisor (changes to the page always need to be re-approved) no later than March 31, 2025

# Student's E-mails

PhD students generaly have:

- Personal e-mail address (e.g., mario.rossi@polito.it)
- Student e-mail address (e.g., sxxxxxx@studenti.polito.it)
- Employee e-mail address (e.g., dyyyyyy@polito.it)

Suggestion is to forward all of them to a single e-mail address to be sure not to miss important communications

PhD students are invited (and may also be solicited, though the group) to let the Coordinator and the Academic Board know about any news which could be distributed to promote and make more visible the PhD Programme (e.g., awards, initiatives, achievements)

# Suggestions by the Coordinator and the Academic Board

Try to make your PhD period as much productive as possible

Make a plan for your activities, and periodically check whether you are matching the plan deadlines and objectives

Interact as much as possible with your supervisor

Let your student representatives know about possible issues, needs, etc., so that they can inform the Coordinator/the Academic Board

In case of problems that cannot be dealt with talking with your supervisor/co-supervisor, contact the Coordinator

Learn Italian (for foreign students)

Constantly update Politecnico di Torino's databases (IRIS, Cruscotto)


Politecnico
di Torino