Welcome meeting

PhD cycle 39
14 Nov 2023

Politecnico di Torino
1859

ScuDo
Scuola di Dottorato ~ Doctoral School
WHAT YOU ARE, TAKES YOU FAR

EECE PhD Program

Electrical,
Electronics and
Communications
Engineering

Stefano Grivet-Talocia

EECE Coordinator

___

stefano.grivet@polito.it

POLITO and the EECE PhD Program

POLITO: According to the 2023 QS world university ranking

38th worldwide for Electrical & Electronic Engineering (12th in Europe)

EECE PhD Program

Very well appreciated worldwide

Deeply connected with the international research community

Strongly supported by the research groups and departments

Strong connections with companies

Many opportunities offered to its students

POLITO is investing significant resources in all its PhD programs, including EECE

PhD students are a major resource in all research universities worldwide

Politecnico di Torino

PhD Program in Electrical, Electronics, and Communications Engineering (EECE)
Stefano Grivet-Talocia, PhD Welcome Meeting – cycle 39, 14 Nov 2023

The Doctoral Candidates...

... are both **students** and **early stage researchers**

The PhD Program trains to carry out research...

→ **in the academic environment**

→ **in companies** looking for **professionals**
who will inspire and manage the innovation process

The PhD Goal
learn how to make research – by doing it!

PhD candidates are expected to

      acquire any **background knowledge** that is required

      become aware of **the state of the art** in his/her research area

      develop new ideas and prove their effectiveness/limitations

      publish the results (journals and international conferences)

      interact with the worldwide research community

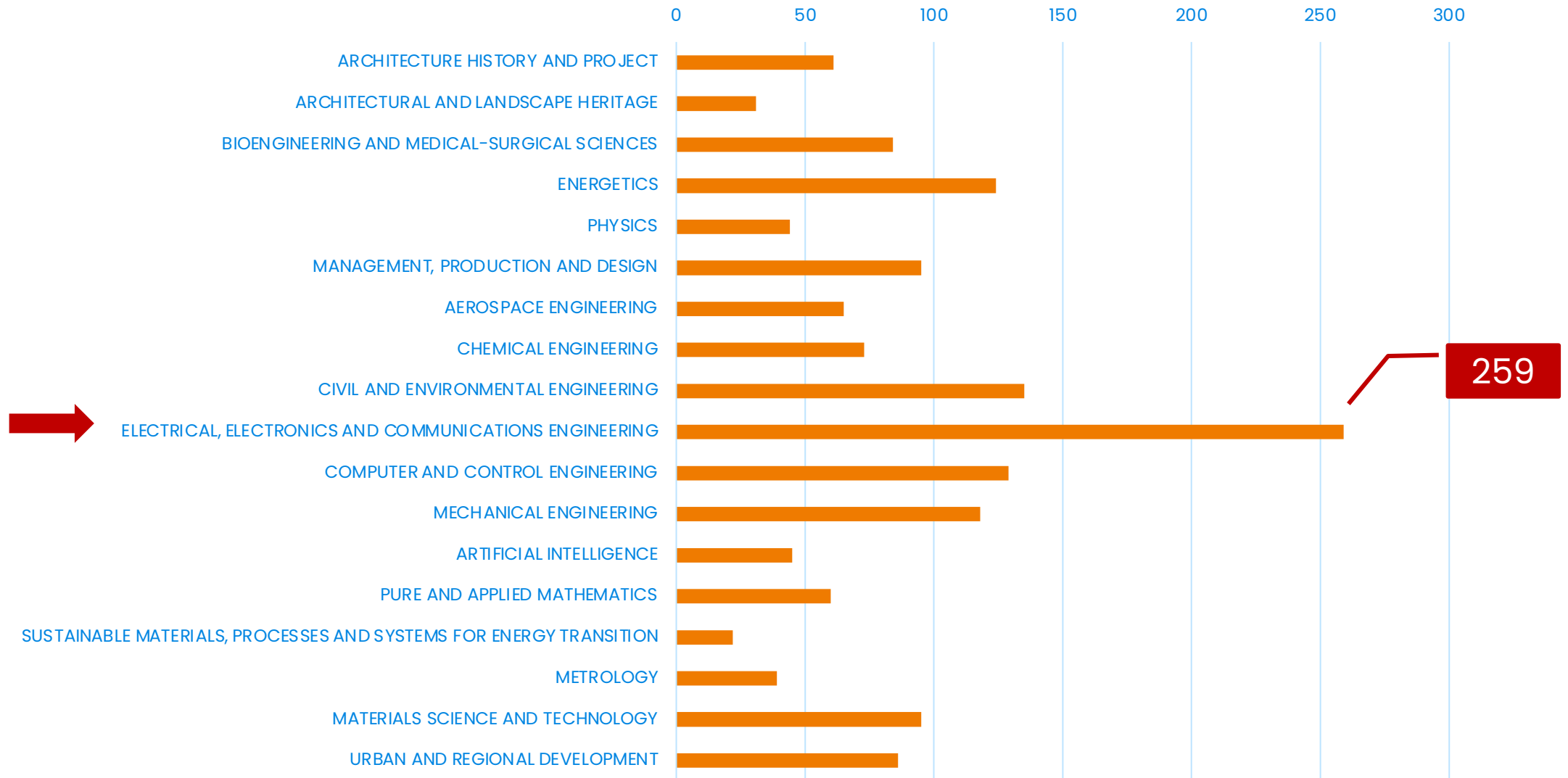   (learn how to) attract resources and **funding**

They are typically involved in **research projects**

      with companies

      funded by public bodies (national, EU or international levels - **PNRR**)

Each PhD candidate is guided by a **supervisor**
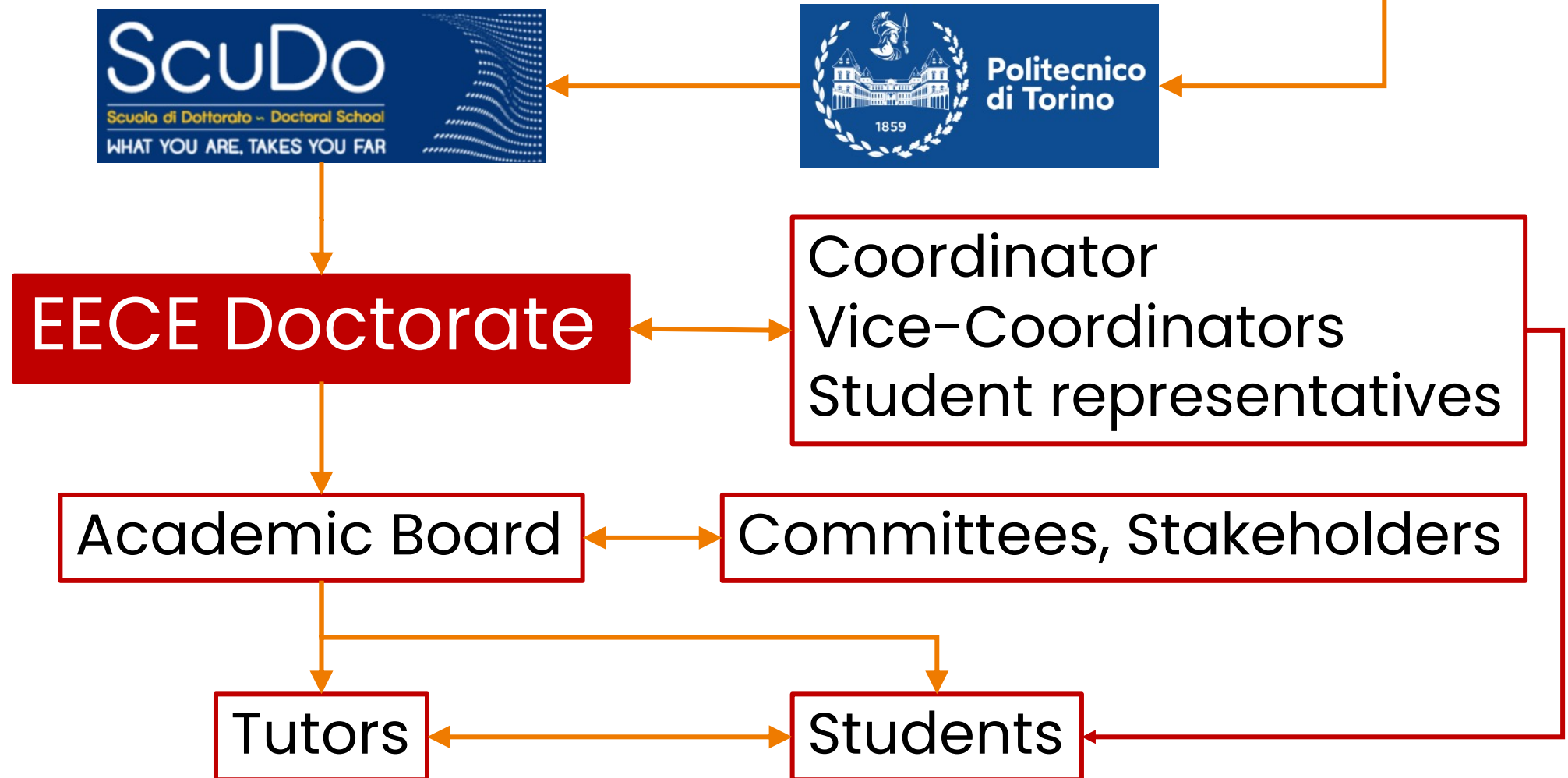
Number of PhD Candidates @ PoliTO: cycles 35–38

259

ARCHITECTURE HISTORY AND PROJECT
ARCHITECTURAL AND LANDSCAPE HERITAGE
BIOENGINEERING AND MEDICAL-SURGICAL SCIENCES
ENERGETICS
PHYSICS
MANAGEMENT, PRODUCTION AND DESIGN
AEROSPACE ENGINEERING
CHEMICAL ENGINEERING
CIVIL AND ENVIRONMENTAL ENGINEERING
ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING
COMPUTER AND CONTROL ENGINEERING
MECHANICAL ENGINEERING
ARTIFICIAL INTELLIGENCE
PURE AND APPLIED MATHEMATICS
SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION
METROLOGY
MATERIALS SCIENCE AND TECHNOLOGY
URBAN AND REGIONAL DEVELOPMENT

EECE: Some Numbers

Cycle	PhD Years	Number of PhD Candidates	
31	2016–2018	32	1 lost, 31 completed
32	2017–2019	31	2 lost, 29 completed
33	2018–2020	58	3 lost, 55 completed
34	2019–2021	56	6 lost, 2 active, 48 completed
35	2020–2022	53	2 lost, 42 active, 9 completed
36	2021–2023	73	6 lost, 66 active
37	2022–2024	73	4 lost, 69 active
38	2023–2025	73	2 lost, 71 active
39	**2024–2026**	**Application is open NOW!**	

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General Organization

EECE Organization: Academic Board (46)

Stefano GRIVET TALOCIA

Roberto GAUDINO
Michele GOANO

Francesco P. ANDRIULLI
Andrea BIANCO
Aldo BOGLIETTI
Iustin Radu BOJOI
Ettore F. BOMPARD
Fabrizio BONANI
Giuseppe C. CALAFIORE
Aldo CANOVA
Federica CAPPELLUTI
Andrea CARENA
Marcello CHIABERGE

Carla F. CHIASSERINI
Gianfranco CHICCO
Paolo CROVETTI
Vittorio CURRI
Danilo DEMARCHI
Fabio DOVIS
Sergio FERRERO
Giovanni GHIONE
Paolo GUGLIELMI
Luciano LAVAGNO
Emilio LEONARDI
Enrico MAGLI
Guido MASERA
Ladislau MATEKOVITS
Michela MEO
Gian Mario PELLEGRINO

Candido PIRRI
Carlo Stefano RAGUSA
Maurizio REPETTO
Alessandro RIZZO
Luciano SCALTRITO
Gianluca SETTI
Filippo SPERTINO
Alberto TAGLIAFERRO
Alberto TENCONI
Elena Maria TRESSO
Giuseppe VECCHI
Francesca VIPIANA
Fabrizio DABBENE – C.N.R.
Gianni MAZZA – I.N.F.N.
Angelo RIVETTI – I.N.F.N.
Amedeo STAIANO – I.N.F.N.

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PhD Program in Electrical, Electronics, and Communications Engineering (EECE)
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EECE Organization: Who's Who

Coordinator

Stefano Grivet Talocia

Vice-coordinators

Roberto Gaudino

Michele Goano

Secretary

Emilio Leonardi

Administration

Andrea Trinchera (DET)

Mariapia Martino (DENERG)

Tiziana Marangoni (DISAT)

Executive board

Stefano Grivet Talocia

Roberto Gaudino

Maurizio Zamboni

Michele Goano

Radu Bojoi

Giuseppe Vecchi

Alessandro Rizzo

Students representatives

Matteo Perrone (DET)

Matteo Raggi (DET)

EECE Organization: Who's Who

Teaching activities committee

Carlo Ragusa

Franco Fiori

Stefano Grivet Talocia

Francesco Bertazzi

Emilio Leonardi

Giuseppe Vecchi

Poster Day committee

Paolo Bardella

Paolo Giaccone

Patrizia Savi

Awards committee

Simona Donati

Fabio Pareschi

Maurizio Repetto

External communications committee

Stefano Grivet Talocia

Maurizio Repetto

Alberto Tibaldi

Alex Minetto

Matteo Raggi

Matteo Perrone

EECE Organization: Stakeholders

Natale AIELLO, STMicroelectronics, Italia

Alessandro AIMAR, Synthara, Svizzera

Mauro BANDINELLI, Ingegneria dei Sistemi S.p.A., Italia

Emanuele BARDO, SPEA S.p.A., Italia

Davide CUDA, Google, Svizzera

Lorenzo D'ANCONA, Vishay Semiconductor Italiana S.p.A., Italia

Natasha DE LEO, INRIM, Italia

Annarita LAZZARI, Deltamu, Italia

Antonio NAPOLI, Infinera, Germania

Daniela PAOLOTTI, Fondazione ISI, Italia

Radu PORUMB, Universitatea Politecnica Bucharest, Romania

Roberto QUAGLIA, Cardiff University, Regno Unito
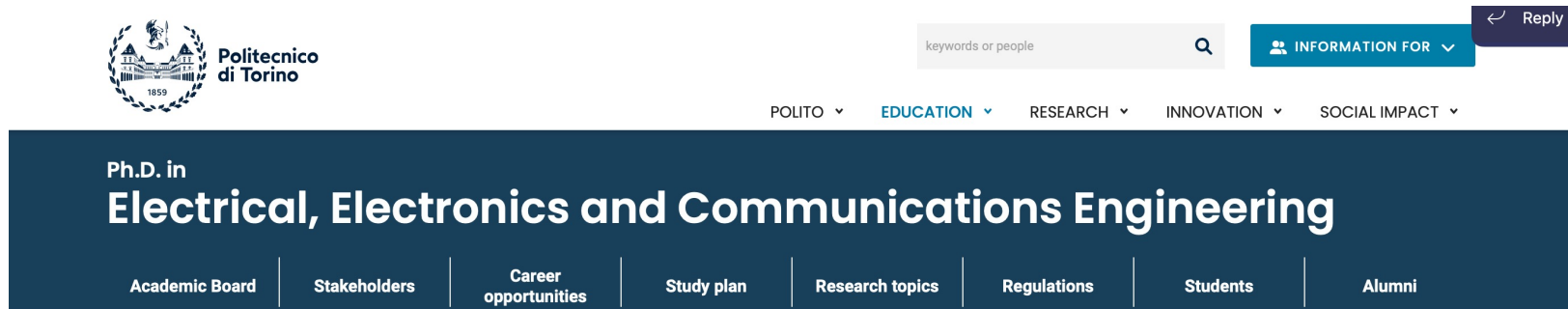
Vittorio RAVELLO, Centro Ricerche Fiat, Italia

Fabio L. TRAVERSA, MemComputing Inc, USA

Paolo VILMERCATI, STMicroelectronics, Italia

Main source of info: web site

`http://www.polito.it/phd/39-411`

EECE PhD Program: Topics

`http://www.polito.it/phd/39-411` -> **Research topics**

"Electrical/Power"

> Power systems
>
> Power converters
>
> Electrical machines and drives

"Electromagnetics"

> Antennas, electromagnetic devices, radars
>
> Biomedical devices and applications
>
> Computational Electromagnetics (low and high frequency)

EECE PhD Program: Topics

`http://www.polito.it/phd/39-411` -> **Research topics**

"Electronics"

Analog, Power, Mixed-Signal Circuits, Embedded Systems

Electromagnetic Compatibility, Signal and Power Integrity

Electronic devices: modeling and characterization

Micro-, nano-technologies, devices, systems, applications

Modeling, simulation and CAD

Photonic devices and solar cells

Radio frequency and microwave electronics

VLSI theory, design and applications

Radiation detectors and readout electronics (INFN, Nat. Inst. Nuclear Physics)

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EECE PhD Program: Topics

`http://www.polito.it/phd/39-411` -> **Research topics**

"Communications"

> Big Data, Machine Learning, Neural Networks, Data Science
>
> Communication and Computer Networks
>
> Geo-positioning, Navigation Systems and Remote sensing
>
> Multimedia Signal Processing
>
> Optical and Wireless Digital Transmissions Systems

"Controls"

> Mechatronics and robotics
>
> Systems, Automation and Control

Some basic rules...

Duration

The PhD program lasts 3 years

1 Nov 2023 – 31 Oct 2026

Max 6 months extension*

*only duration, not scholarship

To graduate

Training requirements

Publication requirements

Write a PhD thesis

Pass the final examination

The PhD Candidate Path
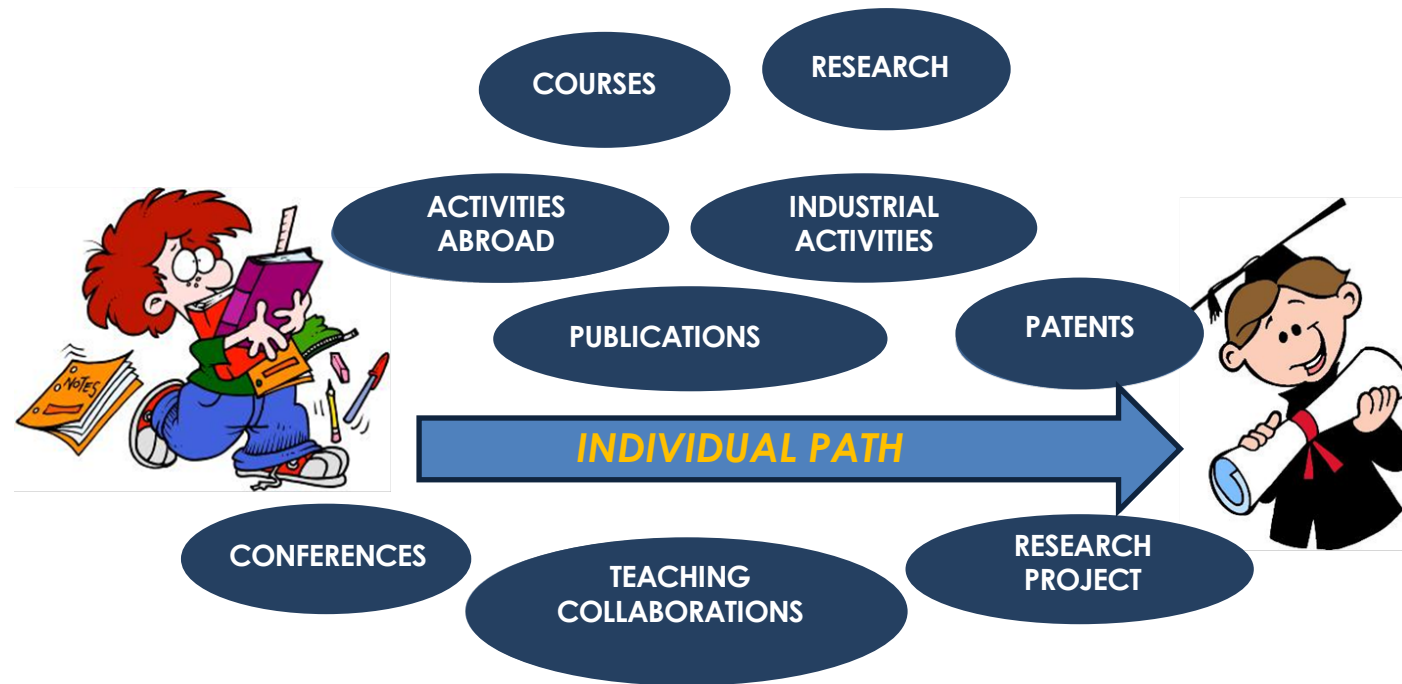
Some Logistics: the PhD Candidate Path

PhD
Selection

Day 0
PhD starts

Year 1
Evaluation*

Year 2
Evaluation*

Year 3
Evaluation*

Final Exam **
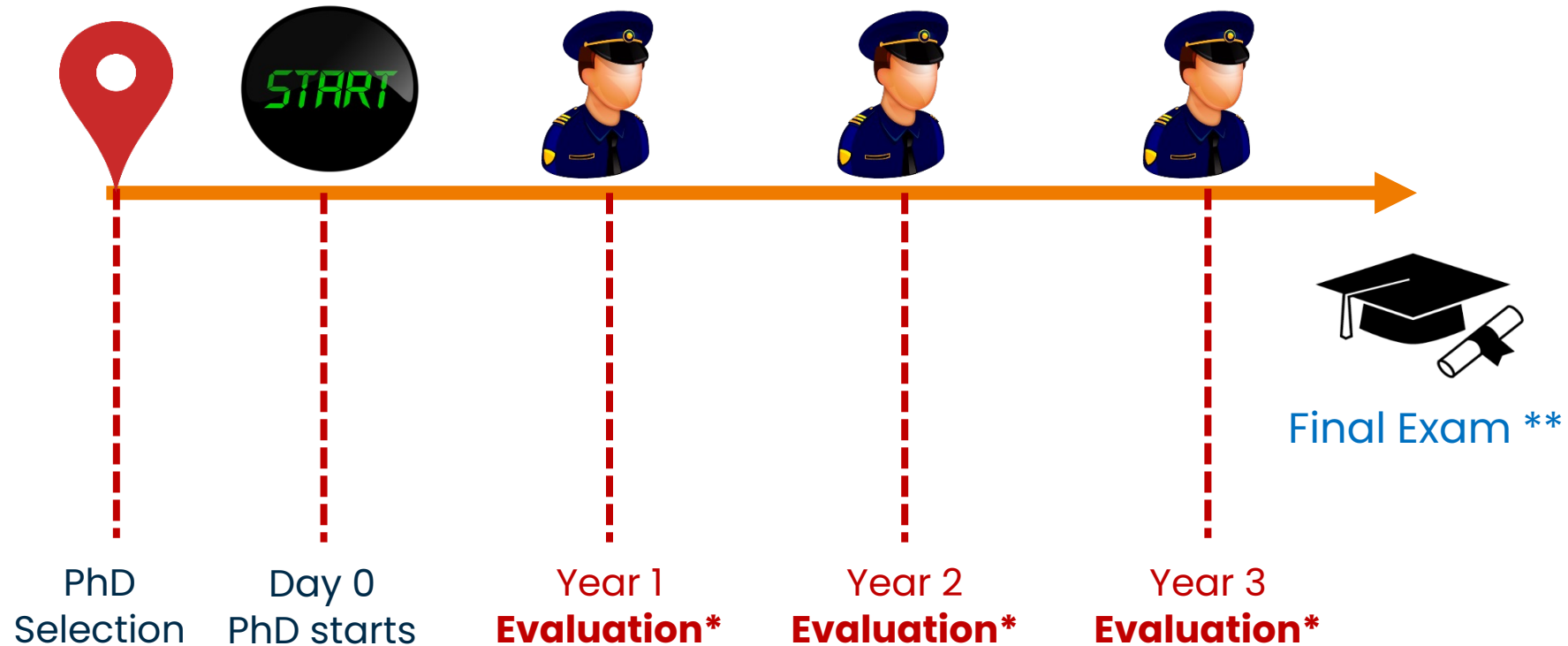
*based on: training (courses), publications, research periods abroad,…

**based on: thesis document (refereed by experts) and thesis defense

PhD Activities

Accounting of all PhD activities is based on a point system

1. Training (hard and soft skills)
2. External research periods (abroad)
3. Publications and scientific production

Training Activities

Hard skills: specialized technical courses (EECE: about 50)

`http://www.polito.it/phd/39-411` **-> Study plan/Hard Skills**

Soft skills: writing a proposal, exploiting IP, speaking in public, ethics, …

`http://www.polito.it/phd/39-411` **-> Study plan/Soft Skills**

How to choose?

Official courses from Scudo + EECE catalogs

External training activities

PhD Summer Schools

Tutorials at conferences

Seminars at prestigious institutions

Soft Skill Courses

Legend

🄴 = E-learning / MOC

🕴️🖳 = Room / Laboratory

Research and Academia ⌄

Industry, companies and professionals ⌄

Entrepreneurship and start-ups ⌄

Public sector and public organizations ⌄

Hard Skill Courses

Managed by **ScuDo** — Scuola di Dottorato – Doctoral School — WHAT YOU ARE. TAKES YOU FAR

Collecting catalogues from all polito PhD programs

List of official courses»

`http://www.polito.it/phd/39-411` **-> Study plan/Hard Skills**

EECE maintains its own list of courses

Some courses are offered every 2 years

This is not visible on the ScuDo official catalog

`http://www.polito.it/phd/39-411` **-> Study plan**

Hard Skill Courses: External Training

ScuDo allows attending external courses
→ must be approved by the Coordinator!

EECE has its own guidelines for course approval

- Official courseware from Universities or Institutions (**YES**)
- Participation to conferences or workshops (**NO**)
- Tutorials and short courses at conferences (**YES**)
- Software training (**NO**, except if requested by tutor)
- Seminars at prestigious Universities/institutions (**YES**)
- Online courses (**NO**, except if requested by tutor)
- «PitchD» seminars by IEEE Student Branch (**YES**)

Must provide a certificate of attendance

reporting your name and the number of course hours

No certificate ⇒ No approval

<u>*Note*</u>: *this page refers to <u>hard skill Courses attended outside POLITO</u>.*
Research periods abroad are also accounted in the PhD career, but they are treated in a different way, see later

<u>*Careful:*</u>
the certificate of attendance must be detailed and, whenever possible, signed by one of the organizers

Approval Process of External Courses

The following steps in the EXACT ORDER please:

1. Courses must be inserted in the «cruscotto» [after attending each course]

    Course description (must be clear!)

    Number of course hours and course dates

    Signed certificate by course organizer

2. Submit the certificate for approval (as part of step 1)

    An automated procedure is in place

    Upload directly the certificate (single PDF, all items in step 1)

    in the dashboard («cruscotto»), as part of application submission

3. The Coordinator or his delegate (Prof. Gaudino) will approve

    Hours will be verified, as well as exam marks and course level (BSc, MSc, PhD)

> *Very important: a (single) pdf document should contain all relevant information. Quite often, the certificate of attendance is NOT sufficient, and you have to merge in the same pdf also OTHER information, like the course program*

Training Activities: Accounting

All activities MUST be inserted in the «cruscotto»

$H_{s,i}, H_{h,i}$: **hours** of course i (s: soft, h: hard)

$$H_h = \sum_i H_{h,i}$$

Phd hard skill course hours are counted in full

M.Sc. hard skill course hours count only 1/2

$$H_s = \sum_i H_{s,i}$$

B.Sc. hard skill course hours count only 1/3

$E_{s,i}, E_{h,i}$: **weight** that accounts for examination result

1 if no exam

4/3 if «pass» (18-**25**)

$$D_{h,i} = E_{h,i} \cdot H_{h,i}, \qquad D_h = \sum_i D_{h,i}$$

5/3 if «pass with merit» (**26**-30)

$D_{s,i}, D_{h,i}$: training **points**

$$D_{s,i} = E_{s,i} \cdot H_{s,i}, \qquad D_s = \sum_i D_{s,i}$$

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di Torino

Research Activities and Publications

Research results should be published

Journal publications

Conference publications

Other (book chapters, patents, etc…)

All publications must be inserted in IRIS database

`https://iris.polito.it`

Automatically copied to the «cruscotto»

Publication metrics are used to evaluate faculty…

…and PhD Students too!

No publications ⇒ No graduation

Publications: Accounting

Publication metrics that are relevant for your PhD

N : total number of **exclusive journal publications** $N = \sum_i N_i$

Only indexed journals in SCOPUS* or WOS** (VQR-approved)

If k authors are polito PhD students, then $N_i = 1/k$

(other non-PhD-Student Authors do not count)

R: cumulative indicator of all publications (includes also conferences)

P_i: score of i-th publication according to polito rules

Journals in 4 quartiles (A: 1.0, B: 0.8, C: 0.5, D: 0.0)
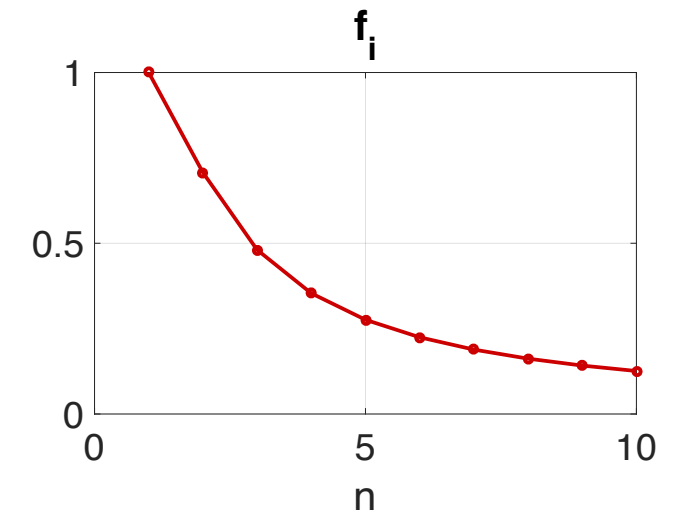
Conferences: standard score 0.5

f_i: weight accounting for number of authors n

$$f_i = \left(\frac{1}{n}\right)^{\left(\frac{n-1}{n}\right)} \text{ if } n \leq 10, \quad f_i = 0.1 \text{ if } n > 10$$

$$R = 50N + \alpha \sum_i P_i f_i \qquad\qquad \alpha = 60 \quad \textbf{EECE}$$

External Research Activities

All PhD students are **strongly encouraged**

to spend a **research period abroad**

Up to 12 months: scolarship amount will be augmented by 50%

Usually, the Tutor plans your research stay

Various calls for proposal to retrieve funding (Erasmus+, etc..)

Plenty of opportunities

Including intenships at companies (that will probably hire you)

All external research activities must be logged in your «cruscotto»

External Research Activities: accounting

1. Request authorization BEFORE departure!!

     There is a special section in your «cruscotto»

2. When you return

     Upload in your «cruscotto» a final PDF report

     Short signed letter from your host confirming the dates of your stay

     No report ⇒ No accounting

3. **External research stay indicator**: $R_e = d/5$

     where d is the number of days of your stay

EECE   delegate for external research stay approval

     Prof. Gaudino: `roberto.gaudino@polito.it`

     … but by default use the «cruscotto»

        (sends notifications automatcally: e-mail ONLY for exceptions)

> _Very important:_ the external research activities are accounted for (see next slides) ONLY if you successfully upload the PDF report in the "cruscotto"

Traveling

When you travel (officially, i.e., paid by polito)

1. You **MUST request authorization BEFORE departure**

    `https://polito.u-web.cineca.it/`

    Include an estimate of your expenses

    MUST select a responsible for the funds to be used: **your supervisor, not you!**

2. Approval process

    Tutor first, then Coordinator : Tutor does not click ⇒ Coordinator will not approve

3. When back

    Submit travel report including receipts on the web portal

    Keep all original receipts (may have to deliver those too)

Research funds for traveling available (5656€), for each of you

This is a MUST also to grant health insurance

Very important: *submit your travel request at least **one week before departure**!*

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EECE PhD Regulations (about to change!)

Admission to final exam (hours and not points)

$N \geq 1, R \geq 50, H_s \geq 40, H_h \geq 100$

Admission to second and third year

No specific requirement: each board decides

EECE

All above SCUDO requirements, plus:

Admission to final exam (for hard skills: **points** and not **hours**)

$N \geq 1, \ R \geq 100, H_s \geq 40, \ D_h \geq 200$ + good marks at poster day

Admission to 3° year:

$T = R + R_e + D_s + D_h \geq 220$ + good marks at poster day

Admission to 2° year:

$T = R + R_e + D_s + D_h \geq 100$ + good marks at poster day

EECE PhD Poster Day

Main event for all EECE PhD Students

Takes place yearly (October)

For 1º , 2º and 3º year students

Last Poster Day: 29-30 September 2022

See web site: `https://posterday-eece.polito.it`

All students must participate

Posters discussed with faculty, other students, and visitors

Results used for admission to 2º and 3º year and final exam

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Awards

The best PhD students are awarded $$$

Each academic year: Students who completed 2° year

Evaluation based on a 2-step process

Dedicated EECE committee

1. Preselection based on points

Your «cruscotto» must be up to date!

2. Shortlisted candidates

Prepare a 5-minute video… guidelines will be provided

Videos are ranked by Reviewers

Last year: 8 total awardees

The Final Exam

Your PhD Thesis must be completed in 3 years!

XXXIX cycle: by October 31, 2026

The final exam starts ONLY... if minimum requirements are met

The academic board votes admission to final exam

can grant short extensions: BY LAW, no more than 6 months

Common critical cases:

... no journal publication

... did not update my «cruscotto»

... still have to complete my thesis (this is ok)

Minimum requirements not met ⇒ Drop from PhD

The Final Exam

1. Admission from academic board
   Make sure your «cruscotto» is always updated!

2. Enroll online

3. Evaluation of the PhD thesis by external referees
   Two from a list of at most 5
   May require revisions and resubmissions
   Thesis must be checked for anti-plegiarism, software available

4. Thesis defense
   Examination board: 2 referees + 3 other membes
   Presentation (about 40 min), in English, Q&A

5. Approved Thesis document upload to IRIS

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Student or Researcher?

You have 2 different Email accounts

	SERVIZI PER LA RICERCA	SERVIZI PER GLI STUDENTI
ID NUMBER	D111222	S333444
MAIL ADDRESS	D111222@polito.it	S333444@studenti.polito.it
ALIAS	john.smith@polito.it	john.smith@studenti.polito.it

Make sure to select one main account

     setup automated redirection from the other

Read your Email!

     the only official means of communication

     keep your Email clients (PC, phone) in sync!

Respond to requests from Tutor and Coordinator

     promptly, do not wait for days before replying

General Recommendations

Training activities

- Try to complete your education during the first two years of your PhD program

Research activities

- **Year 1**: Identification of a research problem, in accordance with your tutor and following an intensive literature survey

- **Year 2**: full-time research work, including stays abroad, establish publication plan ASAP, present your work in public (conferences, seminars)!

- **Year 3**: complete your PhD thesis, finalize publications

General Recommendations

Never loose contact with your Tutor!

Your Supervisor is the ultimate responsible for your PhD activities

You must collaborate closely with your Tutor

A **Declaration of Intent (DoI)** will be executed **(mandatory!)**

Establishes mutually agreed expectations from Tutor and Student

Official document, which will be used by Coordinator to verify compliance (both from Tutor and Student) in the course of the 3 PhD years

If Anything Goes Wrong

S**t happens…

Most problems occur because of

- Poor communication between Tutor and Student

- Bad planning, «I still have 2 years, no worries»

- Ignorance of rules and regulations (both Tutor and Student)

Problems must be identified as early as possible

- Contact your student representatives

- Contact the Coordinator – immediately!!!
  The Coordinator is here to help you, not to judge you
  The Coordinator has the responsibility of applying regulations

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Getting Help

Coordinator

    In case anything else fails...

    Your Tutor should always be the first contact

Administrative offices

    DET: Andrea Trinchera (`andrea.trinchera@polito.it`)

    DENERG: MariaPia Martino (`mariapia.martino@polito.it`)

    DISAT: Tiziana Marangoni (`tiziana.marangoni@polito.it`)

The Student Representatives

    Matteo Perrone(`matteo_perrone@polito.it`)

    Matteo Raggi (`matteo.raggi@polito.it`)

Your senior colleagues

Final Slide: you MUST

Know rules and regulations

Read Email (always: 365/7/24)

Respond to requests from Scudo, Coordinator and Tutor

Meet deadlines (assuming there will be no extension)

Keep the «cruscotto» up to date (daily)

… and enjoy your Doctorate!