

# 2019 GENDER BUDGET



**POLITECNICO**  
MILANO 1863

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# INTRODUCTION TO THE GENDER BUDGETING

It is an undeniable fact that, even today, the word “diversity” may often have a negative meaning in common speech. Something “different” tends to be considered foreign and, even worse, people are often not interested in it.

However, we are convinced that time has come to reverse this trend, and to consider diversity as a value. We say this as engineers - men and women of science - and as the people who lead one of the country’s most prominent cultural institutions: there would never be a discovery if researchers were to think inside the box. The lack of differences between us researchers would considerably limit our capacity to imagine new solutions.

Whatever the angle chosen to analyse the issue, diversity is an asset because comparison and discussion generate new occasions and unexpected opportunities. We are referring to cultural difference as the expression of an open and international university that welcomes students and professors from all parts over the world. We consider difference as the convergence of knowledge acquired in fields of study that have, to date, been kept apart (it is no mere chance that research programmes and teaching methods are becoming increasingly multidisciplinary). Then, let us not neglect the growing integration of humanistic and scientific aspects in response to challenges posed by artificial intelligence, big data and augmented reality.

The gender issue is equally important, and we are very sensitive to this topic at the Politecnico di Milano. We feel deeply about it; hence, we want to overcome mistrust and encourage girls to enrol in undergraduate STEM degrees. We shall always do our best to provide our researchers and consultants with effective support to reconcile both family life and professional growth. Indeed, gender equality is an essential growth factor, not only in our university, but also within a genuinely sustainable European economy that generates well-being and pursues both progress and social cohesion.

There are also many more or less visible facets of human life and thinking that define the meaning of “different”, including religious beliefs, sexual orientation, disability and other aspects. Hence, in 2018, we created POP, Pari Opportunità Politecniche (Politecnico Equal Opportunities). Several companies and institutions have already joined this programme to ensure inclusive study and working environments. Starting from gender identity, POP is organised along five lines of action. It is not a slogan but a practically implemented initiative, and so is this first Gender Budgeting. It is not a required procedure but a genuine commitment to do more and better.

Politecnico di Milano is moving in this direction - this is not empty rhetoric - with its typical practical approach by launching projects that take shape daily, and which are measured and validated. Indeed, only by testing our own limits we will be able to identify and acknowledge them, and only by acknowledging our limits will be able to overcome them.

**Ferruccio Resta**  
*The Rector*

**Donatella Sciuto**  
*The Vice Rector*

# INTRODUCTORY NOTES

The Gender Budget is considered a budget document that analyses the political decisions and allocation of resources for services from a gender-based perspective. Hence, it is meant to become the landmark for scheduling and improving University Management in terms of equality and gender equality.

Politecnico di Milano has adopted the indications provided by the Conference of Italian University Rectors (CRUI) and by the Ministry of Education, University and Research (MIUR), which encourage drawing up the Gender Budget<sup>1</sup>, and has also carefully considered the procedure followed by other Universities to draw up such a document.

Starting from preliminary internal experiences on exploring gender equality conducted at the university in view of drawing up the document, the first edition of the gender budget will present a photograph of the university current situation in terms of gender equality, particularly analysing both the population and the employment and study pathways of the subjects involved. Specifically, it analyses the student population, professors and technical-administrative staff. In addition to this analysis, and prompted by the university's current stance regarding these topics, the gender budget then presents positive policies, measures and actions adopted to promote equal opportunities.

This document includes six chapters, which are thus structured: the first chapter introduces the context and university regulations concerning themes, such as gender equality, and defines subjects actively defending it. The analysis then shifts to the human capital of our university, always from a gender-based perspective, precisely: student population, professors and technical-administrative staff. After describing the current situation, it discusses the planned positive actions implemented at Politecnico di Milano, and the resources invested in supporting equal opportunities.

This document is designed to test a new tool studied to make gender diversity a value to be promoted, not merely a difference to be studied, in order to synergistically design and evaluate internal actions, some of which are already in place, to promote *gender equality*. Indeed, we hope that the positive actions promoted by various subjects may, with this editorial project, be critically analysed using the data collected, and promote an even more intense discussion on the theme in question. Finally, the gender budget offers an initial overall view of all subjects that make up the university, observed from a gender diversity perspective, thus allowing to identify objective evidence to establish university *governance* and development increasingly centred on criteria of fairness, sustainability, efficacy and resource optimisation. In the near future this will allow to achieve deeper integration also of internal programme documents, such as Gender Budget, Positive Action Plan and Integrated Plan.

The Gender Budget has been drawn up by a dedicated working group, also involving the University's various professional figures:

- Donatella Sciuto, Executive Vice Rector, Delegate for Research and Head of the Strategic Programme POP "Pari Opportunità Politecniche" ("Politecnico Equal Opportunities");
- Cristina Masella, Rector's Delegate for Budget Management;
- Cristina Rossi, professor at the Department of Management, Economics and Industrial Engineering and Member of the Steering Committee of the POP Programme;

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<sup>1</sup>CRUI Report: "Indications for the MIUR's positive actions on gender-related themes at the University and in the research framework", May 2018.

- Mara Tanelli, professor at the Department of Electronics, Information and Bioengineering and Member of the Steering Committee of the POP Programme;
- Alessandra Moroni, Selection, Organisational Development and Professional Development Service;
- Paola Barzaghi, Selection, Organisational Development and Professional Development Service;
- Paola Carlucci, Planning and Control Service;
- Carlo Lizzari, Planning and Control Service;
- Silvia Barattieri, Elected member of the Guarantee Committee.

Data processing and analysis were carried out by the Planning and Control Service, under the supervision of the entire working group. We would like to thank all the colleagues who helped in procuring data, especially Vincenzo Buttice, Paola Bertoli and Francesca Teresa Saracino for their assistance in analysing data relating to the employment survey of the student population.

Data used to analyse students were extracted from internal databases and applications; data relative to the 2018 Survey conducted by the Career Service of Politecnico di Milano on students who graduated in 2016 were used for employment surveys; data relate to Professors and Technical-Administrative Staff derive from excerpts of the Cineca application '*Carriere e Stipendi di ateneo*' [university careers and wages], with the exception of scientific credentials resulting from internal processing starting from data extracted from the Cineca application IRIS – '*Institutional Research Information System*'.

Data used for comparisons with the national situation can be found in the document "Focus: Le carriere femminili in ambito accademico" [Focus: women's careers in the academic setting], published by MIUR in March 2019, whose sources come from processing MIUR databases, DGCASIS – Office VI for IT and Statistics Management. Finally, comparisons against some international universities were carried out through the Idea League partnership (<http://idealeague.org/>), which the Politecnico has joined along with ETH Zürich, Switzerland, TU Delft, Holland, RWTH Aachen, Germany, and Chalmers, Sweden. Particularly, these comparisons made use of internal data specifically collected by the partners, with special focus on ETH Zürich's document "Annual Report 2018", available online (<https://www.ethz.ch/en/the-eth-zurich/information-material/annual-report.html>).

Unless otherwise specified, the data analysed concern the whole population considered. If a sample of the same population had to be referred to, the data collected from this sample were analysed and discussed in this document only after verifying that it was a representative sample. To this end common statistical tools were used to characterise the representative nature of a sample, precisely Fisher's Test and the Chi-Squared Test. If this sample were not representative for certain dimensions, appropriate weighting techniques for non-representative components were used to ascertain that the entity of non-representativeness had a negligible impact on the possibility of generalising the results obtained. Since this was always the case for the data contained herein, data reported in this document are presented without corrections.

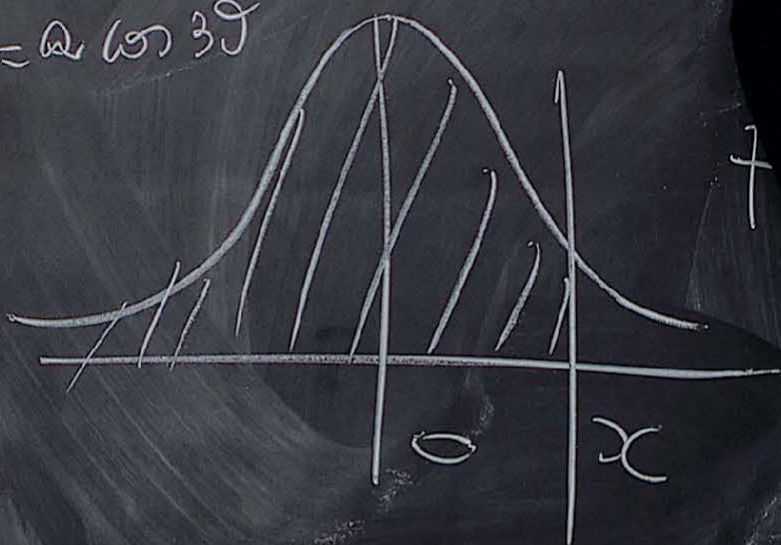
Likewise, we verified that the differences underscored between subgroups of sample data (e.g., employment differences between male and female graduates) and discussed in this document were statistically significant.

It must be said that, to ensure easy reading of this document, the masculine form used for subjects, positions and legal status refers to both genders, and is solely intended for the purpose of simplicity.

$f(x) = \sum_{-\infty}^{+\infty} c_n e^{inx}$



$x = a + i\sigma$



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# 1. THE FRAMEWORK, UNIVERSITY REGULATIONS AND SUBJECTS ACTIVELY DEFENDING GENDER EQUALITY

## 1.1 POLITECNICO DI MILANO IN A NUTSHELL

Politecnico di Milano is a scientific-technological University that trains architects, designers and engineers. Aware of the importance of its social and educational function, the University views a conduct of responsibility and integrity in conducting the various activities, fairness and administrative transparency as essential values to achieve its institutional purposes.

It is ever focused on high quality standards and innovative teaching and research, developing profitable relations with the economic and productive environment by means of experimental research and technological transfer. Research, related to teaching, converges the university and the corporate scene. Cooperation and alliances with the industrial system favour student training that takes into account the framework, and allows the university to enhance the calling of local areas where it is based, thus acting as a stimulus for their progress. Politecnico di Milano participates in many research and training projects, partnering highly qualified European and international universities.

Politecnico di Milano offers university programmes at all levels (Laurea triennale (equivalent to Bachelor of Science), Laurea Magistrale (equivalent to Master of Science)), specialising master's degrees and post-graduate programmes, research doctorate programmes), along with pathways of excellence, such as Alta Scuola Politecnica, in partnership with Politecnico di Torino. It also offers a wide range of free online courses (accessible to everybody, not only to enrolled students), teaching activities with free attendance for enrolled students and courses of Italian and foreign languages.

The drive towards internationalisation leads Politecnico di Milano to participate in European and international *networks* that count leading technical universities, to offer to its students various study programmes in English, several international exchange programmes and a double degree. Generally, the university implements a policy centred on excellence in terms of training and competitive research, always combined with keen focus on the job market's demands.

Table 1.1 presents a synthesis of the "Numbers of Politecnico di Milano"<sup>2</sup>

*Table 1.1: Politecnico di Milano: numbers in a nutshell*

<p><b>STUDENTS AND Ph.D. STUDENTS</b> (a. year 2018/2019, data: April 2019)</p>	<p><b>44,012 Enrolled students</b> (new educational system) out of which:</p> <ul style="list-style-type: none"> <li>• 26,517 laurea triennale (equivalent to Bachelor of Science)</li> <li>• 16,814 laurea magistrale (equivalent to Master of Science) in design</li> <li>• 681 single cycle degree programmes</li> </ul> <p><b>11,783 Graduates</b></p> <ul style="list-style-type: none"> <li>• 6,017 graduates with a bachelor's degree</li> <li>• 5,766 graduates with a master's degree</li> </ul> <p><b>1,010 PhD students</b></p> <p><b>83 Study programmes</b></p> <ul style="list-style-type: none"> <li>• 24 laurea triennale (equivalent to Bachelor of Science) programmes</li> <li>• 30 laurea magistrale (equivalent to Master of Science) programmes</li> <li>• 19 PhD programmes</li> </ul>
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<sup>2</sup> <https://www.polimi.it/en/the-politecnico/about-polimi/politecnico-di-milano-figures/>

<b>INTERNATIONALISATION</b> (academic year 2018/2019, data: April 2019)	<b>6,127 Foreign students</b> enrolled, out of which: <ul style="list-style-type: none"> <li>• First level degree (equivalent to Bachelor of Science) = 1,387</li> <li>• Laurea Magistrale (equivalent to Master of Science) / Single Cycle degree programme = 4,740</li> </ul> Programmes conducted <b>in English</b> : <ul style="list-style-type: none"> <li>• 34 laurea Magistrale (equivalent to Master of Science) programmes</li> <li>• 1 laurea (equivalent to Bachelor of Science) programme</li> <li>• 19 PhD programmes</li> </ul>
<b>RESEARCH AND TECHNOLOGICAL TRANSFER</b> (2018, data: December 2018)	<b>Research projects:</b> <ul style="list-style-type: none"> <li>• 281 EU funded projects (FP7) (2007-2013)</li> <li>• 272 H2020 projects (2014-2020) with funds amounting to 118 mln euro</li> </ul> <b>Technological transfer</b> <ul style="list-style-type: none"> <li>• 54 spin-off companies established, accredited and operating from 2000 to date</li> <li>• 1,815 patents</li> <li>• 701 patent families</li> </ul>
<b>PERSONNEL</b> (data: December 2018)	<ul style="list-style-type: none"> <li>• Permanent technical-administrative staff = 1,237<sub>2</sub></li> <li>• Full professors = 1,403<sub>3</sub></li> </ul>

## 1.2 EUROPEAN AND ITALIAN SCENARIOS

Regarding non-discrimination, gender equality and promotion of equal opportunities, Politecnico di Milano refers to both Italian and international sources and regulations. Indeed, as established by the UN and by the European Union, the theme of gender equality is a criterion to be adopted and complied with when designing, implementing and evaluating public policies.

Considering the national context first, the Italian Constitution sanctions the principle of equality of citizens and, especially, protects working women. The legislation on public administration applies the constitutional rules with emphasis on compliance with the principle of equality and of equal opportunities between men and women, forbidding any form of discrimination, whether direct or indirect, based, among other things, on gender, regarding access to employment, treatment and working conditions, professional training, promotions and work safety.

In Europe, with the enforcement of the Lisbon Treatise of 1<sup>st</sup> December 2009, the rights of women were finally prioritised in the political agenda after a long regulatory pathway that commenced with the Rome Treatises of 1958, and continued in 1984 with the creation of the Committee for Women's Rights and Equal Opportunities. *Gender mainstreaming*, namely the introduction of a gender-based perspective for all policies and on the part of all actors of the institutional political process, was adopted at the Beijing Conference in 1995. These provisions were followed by the Amsterdam and Nice treaties and, finally, by the acknowledgement of equality between men and women as a value of the European Union in 2009, along with the prohibition against discrimination based on sex and on the sexual orientation of individuals.

Despite the regulation and increasing attention given to gender issues, the collection of a massive amount of data and research recently conducted by the *European Institute for Gender Equality (EIGE)* show to what extent gender disparity is still present and constitutes a genuine social and economic damaging factor. On several occasions, the EIGE has stressed that the effectively attaining gender equality, especially in the economic and political sphere, is instrumental for the preservation of sustainable European economy, the creation of full employment, and the generation of well-being for all citizens. If equal gender opportunities are then identified as a necessary condition to pursue European goals of growth, employment and social cohesion, having analysis and evaluation tools that guide public policies, such as *gender budgeting*, namely the drawing up of public budgets based on a gender perspective for fair and equal policies, is even more decisive today. It has been indicated as an essential practice by European bodies already since early 2000s.



In Italy, the debate on gender budgeting has particularly developed during the past decade. In the Public Administration sector, the adoption of a gender budget is related to the need to maximise productivity in the public sector, to the need for efficiency and transparency (Legislative Decree no. 150 of 27 October 2009), and to the promotion of an organisational culture inclined to make the most of the contribution of both men and women (Directive of the Department of Equal Rights and Opportunities of 23 May 2007).

There are several open issues worthy of note in the European and Italian debate, with particular reference to the public and university context:

- despite being a central objective of international agreements, of the main European directives, of the Italian Constitution and of the Italian legislation, gender equality has still not been achieved in various frameworks of society, with strong disparity at all levels; such disparity is a problem not only in terms of fairness but also of *efficiency and efficacy* of organisational actions, which risk excluding the most capable people from the same positions;
- the prevailing tendency of Public Administrations to define *corrective rather than propositional gender policies* introduces the concrete risk of “gender-related” documents, budgets and committees merely being created to comply with a regulation;
- the need to consider gender differences starting from the formulation, design and implementation of the policies themselves, to make *tools* designed to favour equal opportunities operational and functional;
- the *distribution of resources*, which is not always adequate to meet the needs of the subjects involved, whether they are male or female students, or technical-administrative staff, or professors, and which could have concrete effects on the division of roles between men and women;
- the substantial *exclusion* of women from “leading functions” in various settings, teaching, research, administration, thus indicating a serious deficiency for the organisation and a potential threat for the actual implementation of democracy;
- the organisational *culture* rich in limiting beliefs on gender differences, which is also common in modern and avant-garde organisations, and which has yet to complete the phase of accepting difference and of proposing diversity as a resource.

### 1.3 UNIVERSITY REGULATIONS

University regulations are consolidated around the *Statute* of Politecnico di Milano (23 February 2012), the *Code of Conduct* (14 April 2015) and the new *Code of Ethics and of Behaviour* (25 February 2019). The stance of the above documents concerning the theme of equality in a broad sense and, particularly, of gender, is specified below.

#### The Statute of Politecnico di Milano

The university’s statute states the *dignity* of every person both at work and regarding studies, guaranteeing *equal treatment* and promoting *initiatives designed to eliminate discrimination* in training, in access to employment, in orientation and in career progression.

With the Statute, the university:

- acknowledges that underscoring the value of the professional skills of people is a binding condition to effectively carry out its institutional mission;
- promotes active participation of professors, technical-administrative staff and students in making decisions of collective interest; hopes for well-being in study sites and workplaces, and launches preventive strategies to enhance safety and quality; supports ongoing training for staff to enhance their professional skills and to improve both the quality of services provided and the quality of life of employees;

- specifies that the university's Code of Ethics identifies the guiding values and rules of conduct for the behaviour of professors, students, managers and staff;
- appoints the Student Ombudsman to ascertain correct application of the regulations in terms of rights and duties of students and of student unions present in the university; the Guarantee Committee for equal opportunities to improve the well-being of workers, against discrimination, and to disseminate the Code of Ethics and monitor compliance; and the Guarantor of Transparency to verify the circulation of information, advertising and transparency of the university's decisional processes, and to formulate suggestions for any improvements.

#### The Code of Conduct of Politecnico di Milano

The Code of Conduct addresses professors and technical-administrative staff, subjects who, in any capacity whatsoever, perform research and teaching activities at the university, PhD students and students. It is based on the principles of fairness, equality and respect for the basic rights of the person and is designed to promote a favourable climate for mutual respect. The Code has specific functions to provide information about forbidden behaviour and prevent it, such as discrimination, harassment, sexual, moral/psychological harassment and mobbing. It defines procedures for the Confidential Counsellor to protect persons subjected to forbidden behaviour. This figure is called to implement the Code of Conduct and to enable its proper application.

#### Code of Ethics and of Conduct of Politecnico di Milano

The purpose of the Code of Ethics and of Conduct is to identify, transmit and strengthen the essential values when carrying out the teaching, research, study and consulting activities of a public university. It also favours the creation of a professional environment open to dialogue and that protects the person's values under every aspect. With this Code, Politecnico di Milano wants to ensure that every member of the community acts in compliance with the founding values of the university (responsibility, respect, integrity, professionalism, fairness, trust and transparency). Among the expected behaviours, the Code requires each community member to avoid discriminatory behaviour towards other members and to respect everyone without distinction of gender, ethnic origin, nationality, sexual orientation, religion or belief, personal or political beliefs, skills and social conditions.

### 1.4 ACTIVE SUBJECTS FOR GENDER EQUALITY

Based on their institutional characteristics, subjects involved in defending gender equality have different functions, ranging from listening to information, consulting/orientation, up to research and pursuing solutions for identified problems, functions that are not limited only to themes of gender equality, and to the implementation of ad hoc initiatives. The various subjects are identified below, along with their main functions.

#### The Guarantee Committee

The Guarantee Committee (CUG) of Politecnico di Milano promotes equal opportunities of every person at work and regarding studies, with measures designed to prevent and fight any form of discrimination based on sex and sexual orientation, race, ethnic origin, religion, personal and political beliefs, disabilities and age. It contributes to improve the overall quality of work, teaching and learning, promoting the value of gender differences and equal opportunities, also with Positive Action Plans (Directive 4 March 2011 - Department of Public Function and Equal Opportunities). The CUG is a joint body made up of three representatives elected by professors and technical-administrative staff, three representatives elected by students and PhD students, three actual members (and three alternate members) from trade union organisations. The current members are in office for the three-year period 2019/2021.

*The Confidential Counsellor*

Politecnico di Milano has established the figure of the Confidential Counsellor to guarantee practical implementation of the university's Code of Conduct, as established by the European Parliament's Resolution A3-0043/94.

The functions of the Counsellor currently in office, an external professional to the university, are prevention, listening, informing and training to promote a suitable organisational climate that ensures equal dignity and freedom of professors, technical-administrative staff and students at the university. She provides consultation services and assistance to those who report being the victims of discrimination, mobbing, sexual, moral and psychological harassment. She acts autonomously, independently and confidentially, respecting the intention of the person who contacts her, seeking the best strategy to manage and solve the difficult situations of those who resort to her assistance. The CUG and the Confidential Counsellor cooperate in regularly monitoring and analysing situations of unease, discrimination and harassment.

*Help Desk for Workplace Issues*

The Help Desk for Workplace Issues established at the CUG provides counselling service on relational and organisational issues for those who are experiencing unease in their workplace. It is designed to identify theories and strategies to improve and solve the problem. The service is supported by external personnel to the university, and ensures the utmost confidentiality.

*Student Ombudsman*

The Student Ombudsman is at the disposal of students who wish to make a complaint about behaviour that does not comply with university regulations and with the Charter of Students' Rights and Duties. He intervenes to follow-up a non-anonymous complaint, conducts an appropriate inquiry in an attempt to settle the issue and, when this is not possible, depending on the type of problem, informs the most suitable interlocutor (President of the CCS, Headmaster of the School, President of the Joint Committee, Rector, Students' Representatives in the Academic Senate). He protects students against any form of retaliation and informs the complainant and the students' representatives about the outcome of the inquiry.

*Guarantor of Transparency*

The Guarantor of Transparency's duty is to verify and promote the circulation of information, advertising and transparency of decisional processes of Politecnico di Milano. He is appointed by the Rector from among the university's professors, upon proposal of the Academic Senate. The CUG cooperates with the Guarantor of Transparency by reporting behaviours and procedures that contrast with the university's Code of Ethics and with principles of advertising and transparency relative to communications.

*Interuniversity Research Centre on Gender Cultures*

Politecnico di Milano is participating, along with another five Milanese Universities (Università Bicocca, Università degli Studi di Milano, Università Commerciale Luigi Bocconi, Università IULM, Università Vita – Salute San Raffaele), in the Interuniversity Research Centre on Gender Cultures, which was established in 2013 to add momentum to studies, research and positive actions related to the theme of gender cultures. The Centre also contributes towards the growth and dissemination of respect for the dignity and skills of women. The Centre promotes and coordinates research programmes on the topic, in partnership with other institutes, namely universities and governmental and international agencies.

*Project POP - Pari Opportunità Politecniche  
(Politecnico Equal Opportunities)*

Project POP is the strategic programme by which Politecnico di Milano plans on committing itself to ensure a study and work environment that respects gender identities, and different skills, cultures and origins.

The POP project unfolds along five lines of strategic action: gender identity, intercultural, nationality and religious differences, different sexual orientation, support for various disabilities and psychological well-being. For each of the action lines, the university promotes and organises a plan of training initiatives and services (assistance, listening and support) designed to create an inclusive environment that allows students, researchers, professors and administrative staff to follow their career successfully, both inside and outside the university.



## 2. ANALYSIS OF THE STUDENT POPULATION

This chapter presents and discusses data relative to the student population of Politecnico di Milano, only referring to laurea (equivalent to Bachelor of Science) programmes of the New Educational System. With some exceptions specified in the text, data refer to the period 2000-2017, using 2017-2018 as last academic year. The presence of time series allows to underscore the main trends implemented, among which the progressive increase in the female population stands out, accounting for a growing percentage of enrolments and, subsequently, of students who have attained graduation (bachelor/master of science). The university's data are presented disaggregated by gender and by distribution into the three main teaching areas of Politecnico di Milano: Architecture, Design and Engineering. This method of presentation was chosen both to underscore Politecnico di Milano's specific organisation into areas and to facilitate the interpretation of data, since the three areas are mutually heterogeneous not only in terms of discipline but also regarding composition of the student population and of professors. Hence, the distribution of students by gender in the three areas too presents significant differences and is, therefore, worthy of a disaggregated view.

When data are homogeneous, comparisons are also made within the Italian framework based on the document "Focus: le carriere femminili in ambito accademico" [Focus: women's academic careers], published by the MIUR in March 2019, and on comparisons with some IdeaLeague partner universities (<http://idealeague.org/>), which Politecnico di Milano has joined. Data for the latter comparisons were shared by the partners themselves.

The chapter is structured into sections and subsections that ideally follow the stages of the training pathway at the Politecnico, from the entrance test to enrolment and access to the job market. The final section is on the Research Doctorate, which is the last possible stage of the student's pathway at university.

### 2.1 ENTRANCE

This section analyses the first part of the students' pathway at Politecnico di Milano. It starts with the entrance test (which differs for the three areas Architecture, Design and Engineering, for examination methods and for the impact on access to study programmes, as specified below), and continues with the actual enrolment and, therefore, with becoming part of the university's student population. As clearly shown by the subsequent analyses, the three areas witness a highly differentiated access in terms of gender, with Architecture and Design recording the majority of female students, though it is not very evident, and Engineering, instead, yet presenting a male predominance, however with a growing trend in the enrolment of female students.

#### 2.1.1 ENTRANCE TEST

Access to Laurea (equivalent to Bachelor of Science) programmes at the Politecnico is regulated by an entrance test. For Laurea programmes in Architecture, the test is issued by the Ministry with an eligibility threshold of 20 points and a maximum possible score of 90 points. The ranking of the entrance test for Architecture is calculated nationally between all universities. For Engineering programmes, instead, the test is internally developed by Politecnico di Milano: 20/100 is the minimum eligibility mark for ranking phases. In fact, distinct enrolment phases have been established: one phase without ranking for those taking the test in advance (those attaining a score of at least 60/100 can be enrolled) and several ranking phases for places left vacant from the previous phase. The entrance test for Laurea programmes in Design is also developed by Politecnico di Milano, and envisages a minimum eligibility mark of 30/100. In this case, there are two enrolment phases with different rankings for each phase.

The results of the entrance test for the three areas Architecture, Design and Engineering are given below with reference to male and female students enrolled at Politecnico di Milano after taking the entrance test for only one of the three areas<sup>3</sup>. The data refer to academic years 2016- 2017 and 2017-2018, and only to Italian students, as foreign students are entered into separate rankings.

In the Engineering area (where the number of women is much lower than that of men: 21.87% in the academic year 2016-2017 and 21.75% in the academic year 2017-2018), the mean mark for women is lower than that of men by less than two points in the academic year 2016-2017, see Table 2.1, and by only one point in the academic year 2017-2018. Considering the brief timeline referred to by the data represented, this evidence does not allow to make final conclusions but, anyhow, indicates a slight difference in performance in favour of men upon entrance.

Table 2.1: Mean Entrance Test Mark of Enrolled Students – Engineering

Engineering						
	2016/2017			2017/2018		
	Men	Women	Total	Men	Women	Total
<b>No. of observations</b>	4,072	1,140	5,212	4,093	1,138	5,231
<b>Min. mark</b>	25.62	23.47	23.47	20.82	24.2	20.82
<b>Max. mark</b>	100	100	100	100	100	100
<b>Mean mark</b>	71.15	69.34	70.75	69.66	68.66	69.45
<b>Variance</b>	120.87	122.05	121.66	109.72	89.92	105.57

The percentage incidence of the female population considered, on which entrance test scores are calculated, decidedly rises if we consider the area of Architecture (53.94% in the academic year 2016-2017 and 57.25% in the academic year 2017-2018, see Table 2.2). In this case the difference between scores attained by men and women is negligible. The mean score of the former is higher than that of the latter by little more than one point in the academic year 2016- 2017, while the latter surpass the former, if only by 0.27 points, always considering the mean score, in the academic year 2017- 2018.

Table 2.2: Mean Entrance Test Mark of Enrolled Students – Architecture

Architecture						
	2016/2017			2017/2018		
	Men	Women	Total	Men	Women	Total
<b>No. of observations</b>	392	459	851	360	482	842
<b>Min. mark</b>	35	34.9	34.9	22.9	26.7	22.9
<b>Max. mark</b>	79.4	77.1	79.4	82.8	81.7	82.8
<b>Mean mark</b>	54.32	52.94	53.58	52.45	52.72	52.61
<b>Variance</b>	86.74	66.19	76.04	91.60	82.88	86.52

Data relative to the results of the entrance test for the Design area resemble those reported for Architecture. The percentage of the population's female component slightly rises for the Design area, compared to Architecture, and entrance test statistics were calculated based on this percentage, which was 61.53% in the academic year 2016-2017 and 61.35% in the academic year 2017-2018.

<sup>3</sup> For instance, students who, already enrolled in Architecture, took the test for Engineering and then enrolled in Engineering, were not included (< 1% of cases).

The difference in mean marks between men and women is still small. In the academic year 2016-2017, men surpass women by 1.25 points. The difference rises slightly (1.61 points) for the academic year 2017-2018, as shown in Table 2.3 below.

Table 2.3: Mean Entrance Test Mark of Enrolled Students – Design

Design						
	2016/2017			2017/2018		
	Men	Women	Total	Men	Women	Total
<b>No. of observations</b>	282	451	733	284	451	735
<b>Min. mark</b>	44.58	40.83	40.83	31.25	41.25	31.25
<b>Max. mark</b>	87.5	86.25	87.5	89.58	84.58	89.58
<b>Mean mark</b>	64.96	64.16	64.46	65.47	63.86	64.48
<b>Variance</b>	51.57	37.54	43.03	48.94	33.46	40.00

Briefly, it can be said that the scores attained at the entrance test only present minor differences between the two genders.

The graphs in Figures 2.1, 2.2 and 2.3 below show data, divided by gender, relative to the Upper Secondary School of origin of students who took the entrance test and then enrolled for the academic year 2017-2018. As expected, a large percentage of students who took the entrance test for Engineering came from the *Liceo Scientifico* [high school with focus on scientific subjects]. This percentage is particularly high for women, more than eighty per cent of whom came from the *Liceo Scientifico*. The percentage of men from technical institutes is more than three-fold that of women (18.5% vs. 5.0%), and mirrors the gender disproportion between male and female students in Italy's technical institutes, where technical institutes for surveyors, and industrial, aerospace and nautical institutes record approx. 90% of male graduates (ISTAT data for the academic year 2013-2014).

Figure 2.1: Upper Secondary School of Origin of Students Enrolled for the Academic Year 2017/2018 – Engineering

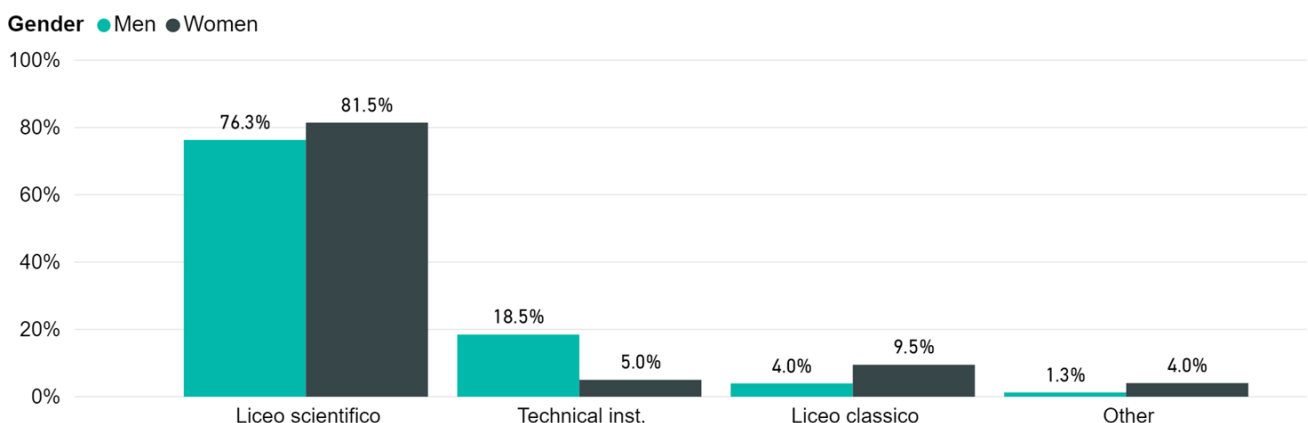
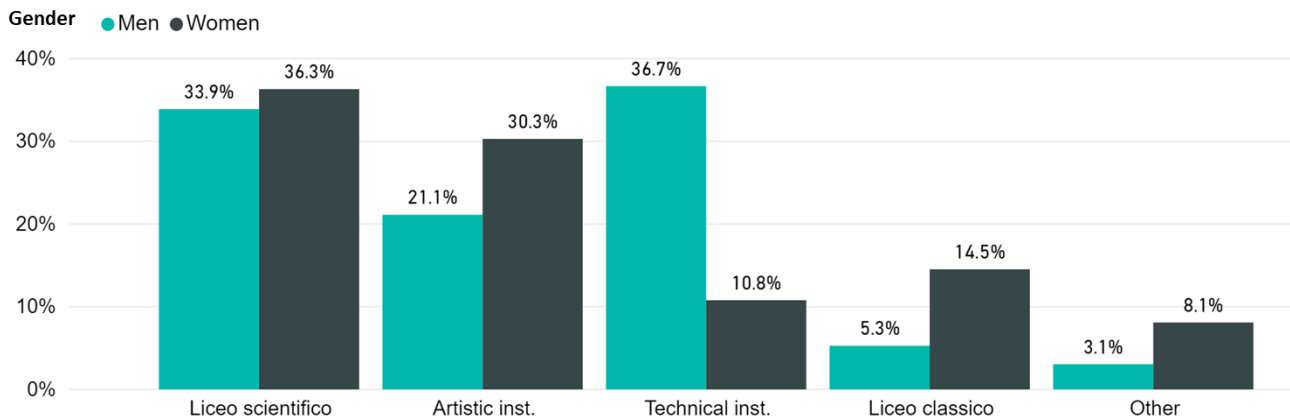




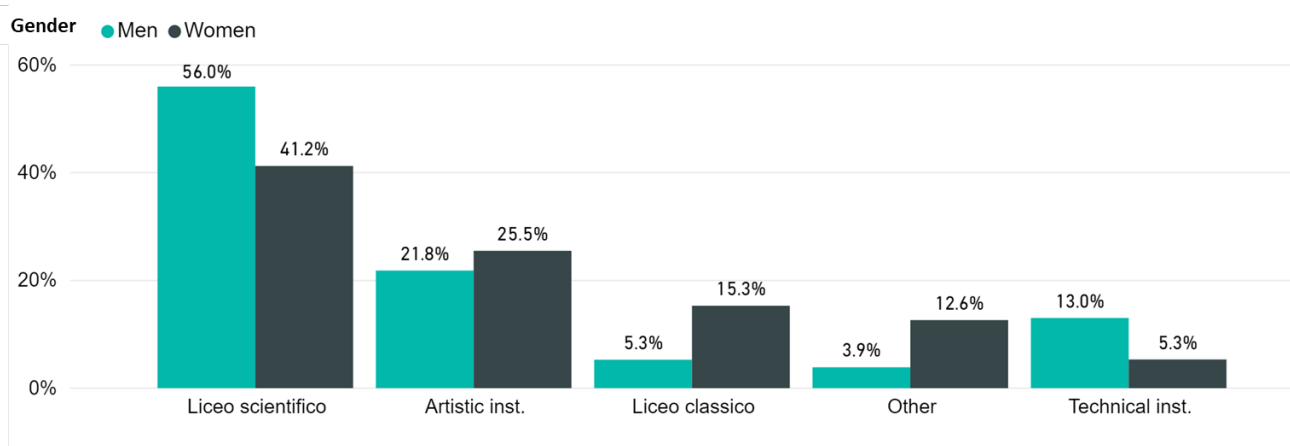
Figure 2.2: Upper Secondary School of Origin of Students Enrolled for the Academic Year 2017/2018 – Architecture



The distribution by Upper Secondary School of origin is more varied for students who took the entrance test for Architecture. The following schools, besides the *Liceo Scientifico* (where gender-related percentages are rather similar), are well represented: *Liceo Artistico* (where female students surpass male students by almost 10 percentage points), technical institutes (where female students are, once again, under-represented), and the *Liceo Classico*, only considering female students, who account for almost 15% of the total number of female students taking the entrance test for Architecture.

The distribution is similar for the Secondary Schools of students who took the entrance test for Design though, in this case, compared to Architecture, the percentage of those who attended a technical institute diminishes, and that of students from other institutes rises.

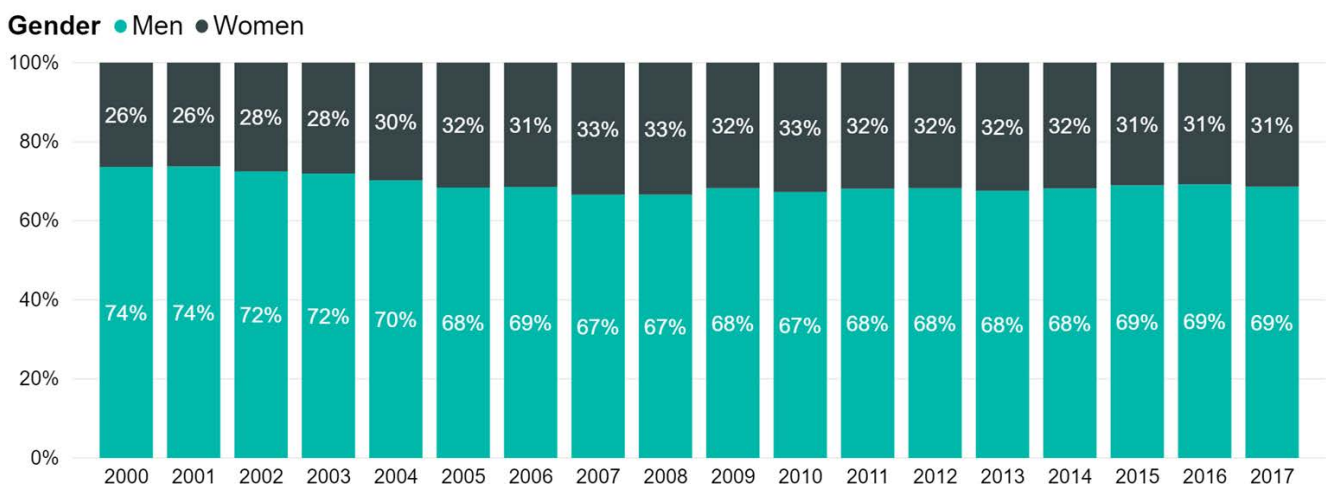
Figure 2.3: Upper Secondary School of Origin of Students Enrolled for the Academic Year 2017/2018 – Design



## 2.1.2 ENROLMENTS

Figure 2.4 reports the difference between men and women regarding enrolments<sup>4</sup> in Lauree Triennali (equivalent to Bachelor of Science)<sup>5</sup> at Politecnico di Milano for academic years from 2000-2001<sup>5</sup> to 2017-2018. A slow but progressive increase can be noticed in the female population, which rises from 26.37% in the academic year 2000-2001 to 31.37% in the academic year 2017-2018. Particularly, in the academic year 2017-2018, 2,339 women vs. 5,116 men enrolled at the Politecnico. As we shall see below, the low female presence overall at Politecnico di Milano is determined by the low percentage of female students enrolled in Engineering, which is, however, consistent with Italian national data, and by the higher relative weight of the Engineering area, compared to Architecture and Design in terms of number of the overall student population. Compared to international universities partnering IdeaLeague, with which homogeneous data was compared, a substantial alignment can be noticed for the year 2017-2018: in 2018 28.3% of overall enrolments in courses at TU Delft concerned female students; ETH in Zurich recorded 32.3% and RWTH Aachen 32.3%. All these universities offer programmes in the areas of Engineering, Science and Technology; hence, they can be basically compared to Politecnico di Milano overall.

Figure 2.4: Enrolments by Gender and Enrolments by Intake – Laurea Triennale (equivalent to Bachelor of Science)



As illustrated in Figure 2.5, even Lauree Magistrali (equivalent to Master of Science) record the same growth trend of the female population, which shifts from 33.02% of enrolments for academic year 2003-2014 to 37.81% of those for academic year 2017-2018. Precisely, 2,540 women vs. 4,178 men enrolled at the Politecnico for academic year 2017-2018.

<sup>4</sup> For the purpose of simplification, enrolments in the Laurea Magistrale (equivalent to Master of Science) single cycle degree programme in Construction Engineering - Architecture were excluded, as they account for less than 1.5% of the total number of enrolments in the Laurea Triennale (equivalent to Bachelor of Science).

<sup>5</sup> Since enrolments usually occur during the first semester, with a practical approach the tables and graphs report the first teaching year of every academic year, for example for academic year 2017-2018, they indicate 2017.

<sup>6</sup> Early withdrawals, which occur by December for enrolments to the first year and by May for enrolments to the second semester, are included. Transfers from other universities during the academic year are, instead, excluded.

Figure 2.5: Enrolments by Gender and Enrolments by Intake – Laurea Magistrale (equivalent to Master of Science)

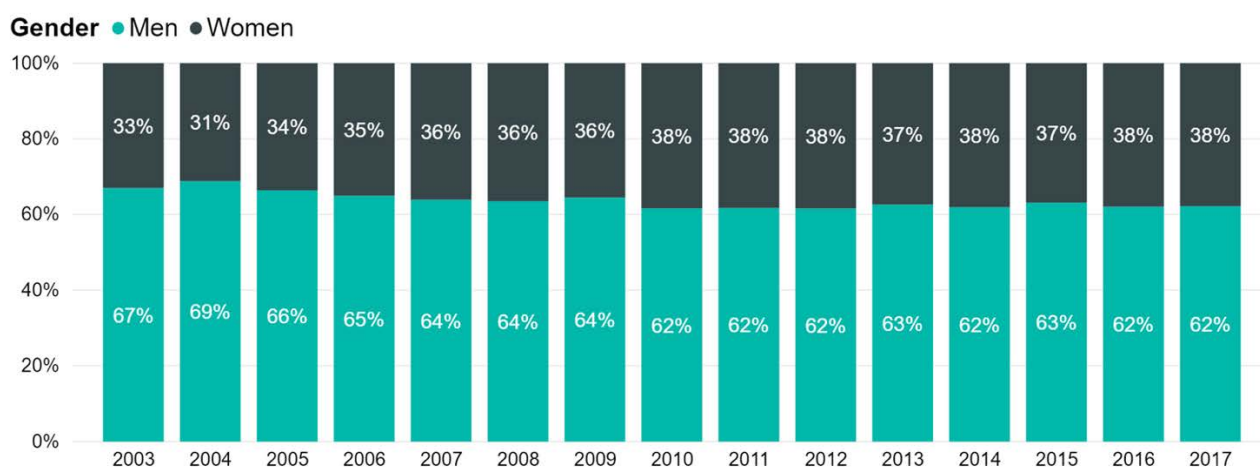


Table 2.4 distinguishes between enrolments in Laurea Triennale (equivalent to Bachelor of Science) and in Laurea Magistrale (equivalent to Master of Science) only for the Engineering area.

Table 2.4: Number and Percentage of Enrolments by Intake and type of Laurea (equivalent to Bachelor/Master of Science) – Engineering

Intake	Engineering									
	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no.	no.	%	no.	%	no.
2000	3,798	85.77	630	14.23	4,428	-	-	-	-	-
2001	3,732	84.24	698	15.76	4,430	-	-	-	-	-
2002	3,734	84.00	711	16.00	4,445	-	-	-	-	-
2003	3,783	83.95	723	16.05	4,506	1,654	81.24	382	18.76	2,036
2004	3,930	83.14	797	16.86	4,727	2,058	80.64	494	19.36	2,552
2005	3,081	82.29	663	17.71	3,744	2,294	78.29	636	21.71	2,930
2006	3,111	82.26	671	17.74	3,782	1,859	78.77	501	21.23	2,360
2007	3,056	80.38	746	19.62	3,802	1,803	77.88	512	22.12	2,315
2008	3,427	79.40	889	20.60	4,316	1,901	77.34	557	22.66	2,458
2009	3,702	79.53	953	20.47	4,655	1,911	77.03	570	22.97	2,481
2010	3,604	79.96	903	20.04	4,507	1,892	75.20	624	24.80	2,516
2011	3,790	80.74	904	19.26	4,694	2,080	74.63	707	25.37	2,787
2012	4,241	79.20	1114	20.80	5,355	2,227	74.51	762	25.49	2,989
2013	4,326	76.62	1320	23.38	5,646	2,419	74.52	827	25.48	3,246
2014	4,150	77.34	1216	22.66	5,366	2,406	74.51	823	25.49	3,229
2015	4,398	77.62	1268	22.38	5,666	2,882	74.47	988	25.53	3,870
2016	4,392	77.20	1297	22.80	5,689	3,171	72.88	1180	27.12	4,351
2017	4,392	77.31	1289	22.69	5,681	3,402	72.17	1312	27.83	4,714

An increase is noticed in female enrolments for both types of laurea (equivalent to Bachelor/Master of Science); particularly, the percentage of women enrolled in the Laurea Triennale (equivalent to Bachelor of Science) shifts from 14.23% in academic year 2000-2001 to 22.69% in academic year 2017-2018, while

enrolments in Laurea Magistrale (equivalent Master of Science) programmes have recorded an increase of almost 10 percentage point from academic year 2003 – 2004 (18.76%) to academic year 2017 – 2018 (27.83%). We can observe, always referring to the MIUR's Focus document on Italian academic careers, which reports 27.4% of female students enrolled in the School of "Engineering and Technology", that Politecnico di Milano's data are entirely consistent with the Italian mean. Regarding the case of Politecnico di Milano, it is interesting to observe that female students enrolled in the Laurea Magistrale (equivalent to Master of Science) are approx. five percent higher than those enrolled in the Laurea Triennale (equivalent to Bachelor of Science). This seems to indicate a greater inclination to complete the study cycle once they start the university pathway. The rest of the chapter will analyse, as an additional in-depth study, also the inclination to withdraw from studies, which is another variable that might contribute to determine this increase in the relative weight of female students in Laurea Magistrale (equivalent to Master of Science) programmes for Engineering.

The relative weights of male and female enrolments are, instead, the reverse for Architecture, see Table 2.5, where the female population is decidedly larger, since it is also increasing in time. From 51.28% in academic year 2000-2001 to 57.84% in academic year 2017-2018 for Laurea Triennale (equivalent to Bachelor of Science) and from 53.86% in academic year 2003-2004 to 59.85% in academic year 2017-2018 for Lauree Magistrali (equivalent to Master of Science). Even in the case of Architecture, as for Engineering, the percentage of women is stably higher (except for academic year 2004-2005) for enrolments in Laurea Magistrale (equivalent to Master of Science) programmes, compared to enrolments in Laurea Triennale (equivalent to Bachelor of Science) programmes, with differences in the range of 2-10 percentage points.

Table 2.5: Number and Percentage of Enrolments by Intake and type of Laurea (equivalent to Bachelor/Master of Science) – Architecture

Intake	Architecture									
	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no	no.	%	no.	%	no
2000	725	48.72	763	51.28	1,488	-	-	-	-	-
2001	763	52.58	688	47.42	1,451	-	-	-	-	-
2002	762	51.56	716	48.44	1,478	-	-	-	-	-
2003	761	51.25	724	48.75	1,485	394	46.14	460	53.86	854
2004	725	47.39	805	52.61	1,530	472	49.22	487	50.78	959
2005	850	51.30	807	48.70	1,657	569	49.61	578	50.39	1,147
2006	800	51.12	765	48.88	1,565	336	41.84	467	58.16	803
2007	813	50.25	805	49.75	1,618	395	43.99	503	56.01	898
2008	744	46.44	858	53.56	1,602	468	42.98	621	57.02	1,089
2009	752	49.12	779	50.88	1,531	502	46.22	584	53.78	1,086
2010	770	47.50	851	52.50	1,621	532	42.73	713	57.27	1,245
2011	757	47.64	832	52.36	1,589	524	43.09	692	56.91	1,216
2012	689	45.39	829	54.61	1,518	556	42.80	743	57.20	1,299
2013	609	46.17	710	53.83	1,319	546	42.72	732	57.28	1,278
2014	427	42.74	572	57.26	999	478	40.07	715	59.93	1,193
2015	443	44.70	548	55.30	991	538	40.94	776	59.06	1,314
2016	450	46.25	523	53.75	973	564	40.43	831	59.57	1,395
2017	425	42.16	583	57.84	1,008	546	40.15	814	59.85	1,360

An analysis of data relative to the Design area presented in Table 2.6 reveals a particularly evident increase in the female population. In little less than two decades, enrolments in Laurea Triennale (equivalent to Bachelor of Science) have shifted from being little less than those of men (48.8% in academic year 2000-2001) to surpassing them by approx. 10 percentage points in academic year 2017-2018 (60.97%). Once again,

percentages are higher for the Laurea Magistrale (equivalent to Master of Science) compared to the Laurea Triennale (equivalent to Bachelor of Science), reaching almost 65% in the academic year 2017-2018.

Table 2.6: Number and Percentage of Enrolments by Intake and type of Laurea (equivalent to Bachelor/Master of Science) – Design

Design										
Intake	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no.	no.	%	no.	%	no.
2000	389	51.52	366	48.48	755	-	-	-	-	-
2001	381	52.19	349	47.81	730	-	-	-	-	-
2002	434	49.43	444	50.57	878	-	-	-	-	-
2003	424	46.39	490	53.61	914	222	44.49	277	55.51	499
2004	391	42.22	535	57.78	926	300	49.83	302	50.17	602
2005	388	42.54	524	57.46	912	315	44.30	396	55.70	711
2006	369	41.14	528	58.86	897	206	38.58	328	61.42	534
2007	383	39.73	581	60.27	964	168	34.36	321	65.64	489
2008	311	38.40	499	61.60	810	188	39.33	290	60.67	478
2009	278	37.37	466	62.63	744	201	41.19	287	58.81	488
2010	286	35.79	513	64.21	799	194	39.75	294	60.25	488
2011	264	33.93	514	66.07	778	165	34.09	319	65.91	484
2012	289	37.48	482	62.52	771	167	33.33	334	66.67	501
2013	237	34.55	449	65.45	686	204	37.85	335	62.15	539
2014	310	38.75	490	61.25	800	150	31.38	328	68.62	478
2015	287	36.94	490	63.06	777	168	33.67	331	66.33	499
2016	292	38.68	463	61.32	755	196	33.33	392	66.67	588
2017	299	39.03	467	60.97	766	230	35.71	414	64.29	644

Hence, the above data show that, over the years, the university has followed a dual track towards gender equality in the student population. This equality has been reached and exceeded in the areas of Architecture and Design, while it still seems remote for Engineering, despite the ongoing progress. However, there is some consistency between data of Politecnico di Milano and the Italian scene in this sector. It is clear that no specific actions can reverse this situation in the short/medium term, since the problems related to poor access of women to STEM subjects in a broad sense, and particularly to technological and engineering subjects, requires not only local actions but new cultural models that can spread only with the synergistic efforts of all institutions in a significant period of time.

## 2.2 ACADEMIC CAREER

This section analyses the study pathway of male and female students at Politecnico di Milano who enrol in various areas, according to the proportions analysed below. Key events of the academic career will be described by focusing on the duration of the study programme, on the withdrawal percentage and on the percentages of male and female graduates and their relative graduation marks. Consistently with the above, these analyses refer to Architecture, Design and Engineering, and separately to Laurea Triennale and Magistrale (equivalent to Bachelor/Master of Science) programmes.

### 2.2.1 STUDY PROGRAMME DURATION

Regarding the university career, we focus on two basic indicators: *duration of the study programme* of students enrolled for a certain academic year (calculated considering all the graduates of the Politecnico on

31 December 2018) and the *percentage of withdrawals*.<sup>7</sup> Early withdrawals have been included (December for the first semester and May for the second), and transfers from other Universities during the academic year have been excluded. It must be said that, for the purpose of simplification, the duration of the study programme is calculated considering enrolments until academic year 2012-2013, as it was the last academic year during which male and female students enrolled in the Laurea Triennale (equivalent to bachelor of science) had the opportunity to complete their entire study programme within the established period of time, including the Laurea Triennale and Magistrale (equivalent to bachelor/master of science).

Table 2.7: Mean Duration of the Laurea by Enrolment Intake and type of Laurea (equivalent to bachelor/master of science) – Engineering

Engineering						
Intake	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
2000	4.03	3.71	3.9	-	-	-
2001	4.04	3.66	3.9	-	-	-
2002	4.04	3.66	3.9	-	-	-
2003	4.15	3.82	4.0	2.76	2.59	2.7
2004	4.21	3.87	4.1	2.75	2.63	2.7
2005	4.15	3.88	4.1	2.82	2.62	2.7
2006	4.15	3.89	4.1	2.88	2.68	2.8
2007	4.10	3.87	4.0	2.83	2.63	2.7
2008	4.05	3.88	4.0	2.89	2.73	2.8
2009	4.00	3.83	3.9	2.82	2.71	2.7
2010	3.96	3.73	3.9	2.76	2.70	2.7
2011	3.91	3.76	3.8	2.72	2.59	2.6
2012	3.79	3.69	3.7	2.65	2.53	2.6

Table 2.8: Mean Duration of the Laurea by Enrolment Intake and Type of Laurea (equivalent to bachelor/master of science) – Architecture

Architecture						
Cohort	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
2000	4.03	3.69	3.85	-	-	-
2001	4.28	3.82	4.05	-	-	-
2002	4.31	3.97	4.13	-	-	-
2003	4.44	3.93	4.17	3.22	2.92	3.06
2004	4.17	3.84	3.99	3.24	3.16	3.20
2005	4.26	3.94	4.09	3.29	3.09	3.19
2006	4.26	3.80	4.02	3.06	2.99	3.02
2007	4.11	3.75	3.92	2.99	2.87	2.92
2008	4.14	3.84	3.97	3.03	2.88	2.94
2009	3.95	3.72	3.83	2.80	2.79	2.79
2010	3.99	3.70	3.83	2.89	2.73	2.80
2011	3.79	3.54	3.65	2.81	2.76	2.78
2012	3.67	3.49	3.57	2.85	2.75	2.79

Table 2.9: Mean Duration of Laurea by Enrolment Intake and type of Laurea (equivalent to bachelor/master of science) – Design

Intake	Design					
	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
2000	3.51	3.21	3.35	-	-	-
2001	3.54	3.25	3.39	-	-	-
2002	3.67	3.23	3.43	-	-	-
2003	3.63	3.25	3.42	2.61	2.43	2.50
2004	3.52	3.32	3.40	2.72	2.60	2.66
2005	3.61	3.34	3.45	3.05	2.90	2.96
2006	3.55	3.37	3.45	3.18	2.84	2.96
2007	3.56	3.42	3.47	2.94	2.98	2.97
2008	3.51	3.39	3.43	3.06	2.87	2.94
2009	3.51	3.27	3.35	3.13	2.87	2.98
2010	3.40	3.30	3.33	2.91	2.72	2.79
2011	3.44	3.22	3.29	2.86	2.83	2.84
2012	3.28	3.20	3.23	2.79	2.87	2.84

The analysis of data reported in Tables 2.7, 2.8 and 2.9 reveals that, in the course of time, women have a slightly but stably better performance than men in terms of duration both of the Laurea Triennale and of Laurea Magistrale (equivalent to bachelor/master of science) programmes in all three areas of Engineering, Architecture and Design. In fact, for students who enrolled in the period 2000-2012, the duration of a Laurea Triennale (equivalent to bachelor of science) programme in Engineering at Politecnico di Milano was, on average, 3.78 years for women and 4.04 years for men (mean difference in time equal to 0.26 years); the mean difference in time between men and women to complete the Laurea Triennale was 0.34 years for Architecture (3.77 and 4.11 years, respectively) and 0.23 years for Design (3.29 and 3.53 years, respectively).

## 2.2.2 WITHDRAWALS FROM THE ACADEMIC CAREER

Moving on to analyse the withdrawal rate from the university career, defined as *interruption of the study programme prior to completion*, the reference considered is made up of students presenting a status of “career deactivated”<sup>8</sup> on 31 December 2018, compared to enrolments<sup>9</sup> for a certain academic year. As mentioned above, to ensure comparable data between the various years, the enrolment years considered by the analysis only include those for which the entire study cycle could have been completed by 31 December 2018, namely those in the period from academic year 2000-2001 to academic year 2012-2013. As previously stated, data are presented disaggregated into the three areas of Engineering, Architecture and Design, and by type of Laurea, Triennale or Magistrale (equivalent to bachelor/master of science). Particularly, Figures 2.6 and 2.7 show data relative to the Laurea Triennale and Magistrale of Engineering; Figures 2.7-2.8 and Figures 2.9-2.10, instead, report the same analysis for Architecture and Design, respectively. An overall view of these data shows that the percentages of withdrawal were stably higher for Engineering and Architecture, than for Design, which presents a lower rate of withdrawals.

<sup>8</sup> The status of “career deactivated” includes students who renounced their studies, transfers to other Universities and deceased persons.

<sup>9</sup> As always, the calculation of enrolments includes students who withdrew early from their studies, that is by December for enrolments for the first semester and by May for those for the second semester.

Moreover, as expected, the incidence of withdrawals is higher for the Laurea Triennale (equivalent to bachelor of science) than for the Laurea Magistrale (equivalent to master of science), regardless of the area considered.

In the period 2000-2012, on average, withdrawals from the academic career concerned 34% of those who had chosen a Laurea Triennale (equivalent to bachelor of science) programme in Engineering, 24.7% of those who had chosen a Laurea Triennale programme in Architecture, and 20.3% of those who had chosen a Laurea Triennale programme in Design. Broadly speaking, fewer women than men withdrew from the academic career. Withdrawal percentages of women from Laurea triennale programmes in Engineering are 25.6% vs. 35.8% for men; for the Laurea Triennale programmes in Architecture they are 19.4% and 28.3%, respectively, while for the laurea (equivalent to bachelor of science) programme in Design they are 17.4% vs. 24.3% respectively.

Focusing on the evolution of time series that show withdrawal rates, we notice that, unless there are some sporadic fluctuations and “intake effects”<sup>10</sup>, the percentage of withdrawals is constantly less for women, generally with differences stably more evident in the case of Engineering. Data seem to suggest that, in a prevalently male context, such as Engineering, women are inclined to complete the study programme in a consistently larger number than their male colleagues. Besides the necessary caution when interpreting this data, this evidence seems to indicate that the greater determination women need to enter a study environment that is still dominated by men enhances their perseverance to complete the study pathway. Moreover, it is reasonable to assume that, at a personal level, once the cultural difficulties that keep women away from STEM subjects are overcome, and perhaps also as a result of the additional reflection required to motivate the choice of a study programme that is still perceived as “anomalous”, women make the choice with greater awareness and are more motivated to follow the pathway to the very end.

*Figure 2.6: Percentage of Students with Deactivated Career out of Enrolments by Intake – Engineering – Laurea Triennale (equivalent to bachelor of science)*



<sup>10</sup> Since withdrawals concern those who were in a “status of ceased career” on 31 December 2018, this status is more likely for students who enrolled in more remote academic years.



Figure 2.7: Percentage of Students with Deactivated Career out of Enrolments by Intake – Engineering – Laurea Magistrale (equivalent to master of science)

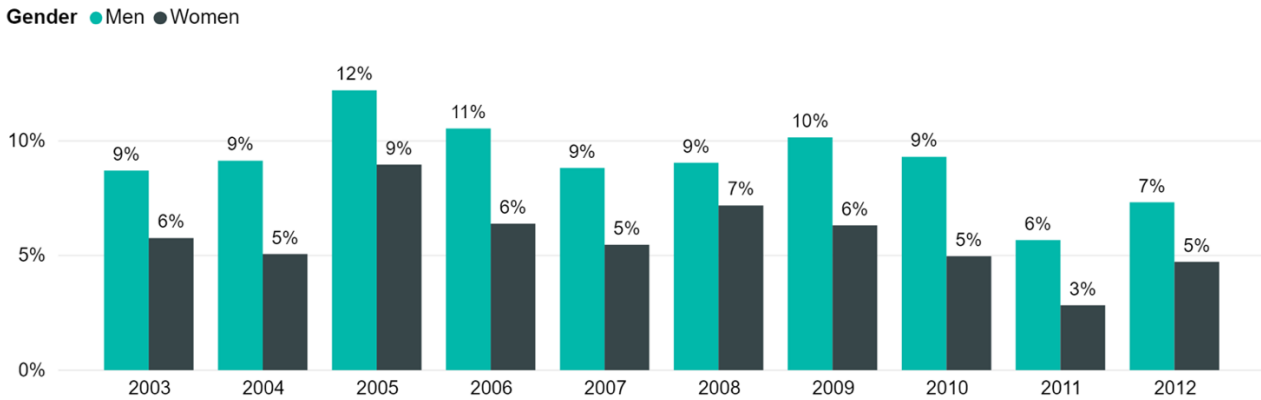


Figure 2.8: Percentage of Students with Deactivated Career out of Enrolments by Intake – Architecture – Laurea Triennale (equivalent to bachelor of science)

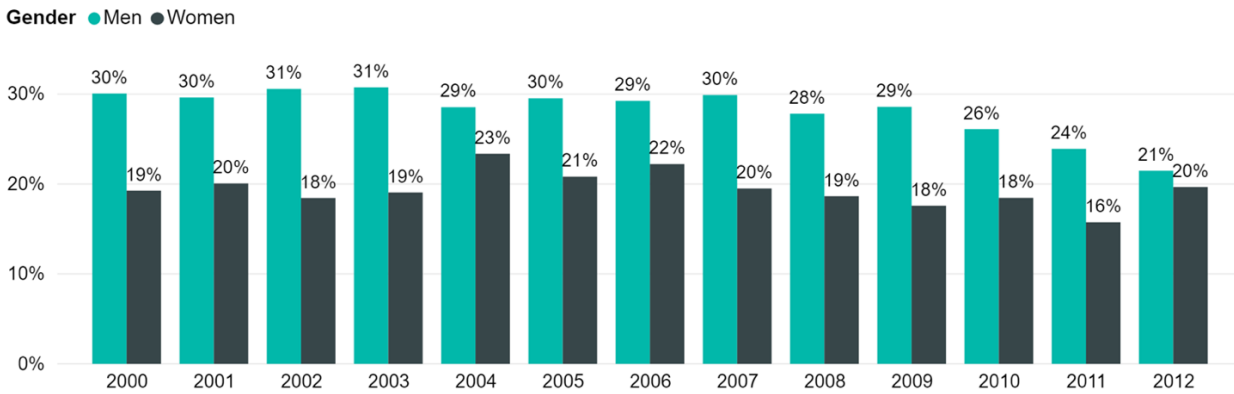


Figure 2.9: Percentage of Students with Deactivated Career out of Enrolments by Intake – Architecture – Laurea Magistrale (equivalent to master of science)

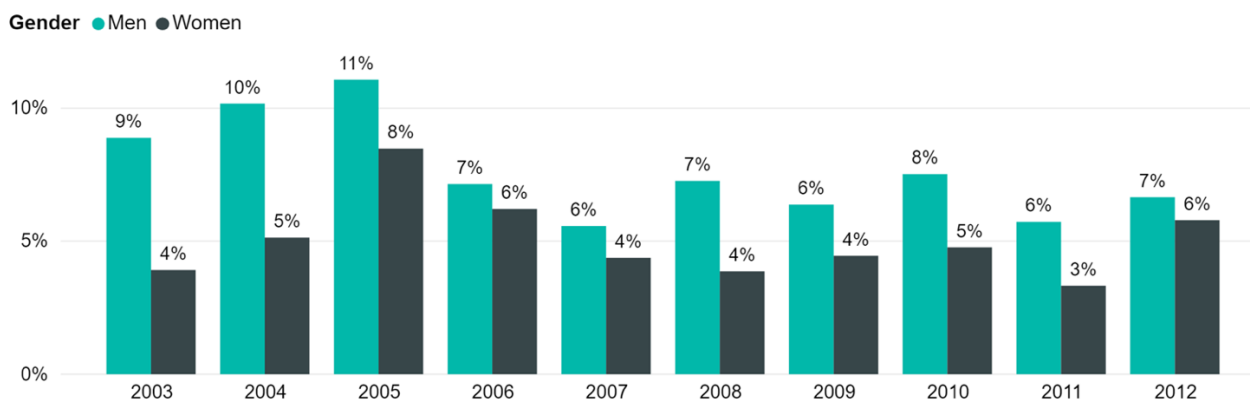


Figure 2.10: Percentage of Students with Deactivated Career out of Enrolments by Intake – Design – Laurea Triennale (equivalent to bachelor of science)

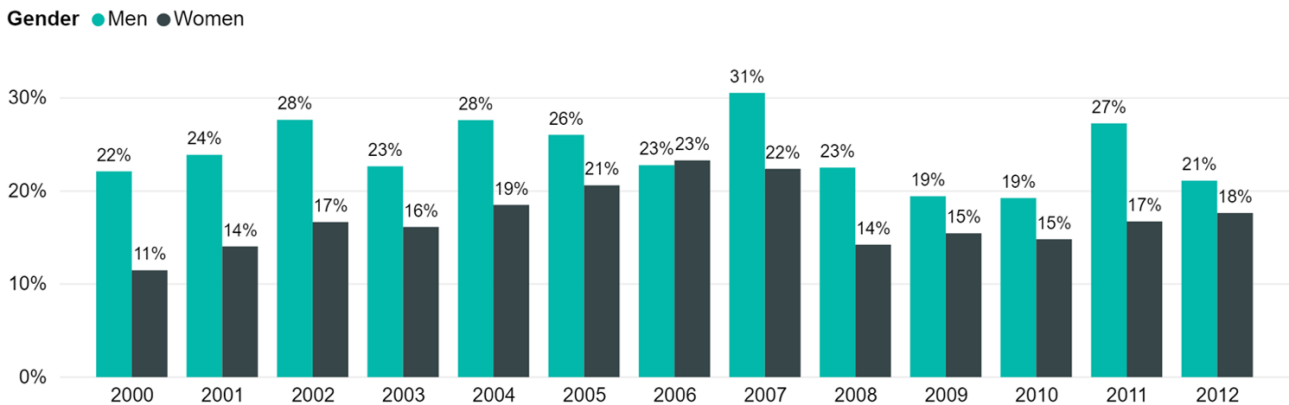
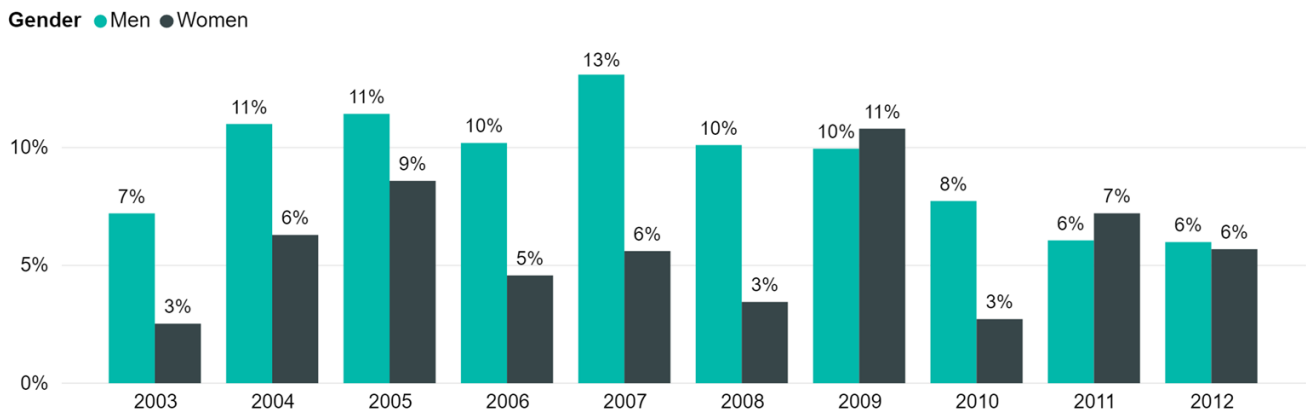


Figure 2.11: Percentage of Students with Deactivated Career out of Enrolments by Intake – Design – Laurea Magistrale (equivalent to master of science)



### 2.3 LAUREA (equivalent to bachelor of science)

We shall now analyse the percentages of male and female graduates at Politecnico di Milano, considering distribution by the graduation marks attained.

Figures 2.12 and 2.13 indicate that 68.93% of enrolments to Laurea Triennale (equivalent to bachelor of science) programmes in the period academic year 2000-2001 and academic year 2012-2013 concluded with completion of studies; the percentage of female graduates was 77.8%, while the percentage of male bachelor's degree graduates was 65%. Regarding the percentage of those who attained a Laurea Magistrale (equivalent to master of science) relative to students who enrolled in the period from academic year 2000-2001 to academic year 2012-2013, it is equal to 90.8% for the entire Politecnico; the percentage of female graduates is 93%, and that of male graduates is 89.6%. In other words, considering the enrolments, not only do women complete their study programme faster than men and present fewer withdrawals from the university career but they subsequently graduate in larger numbers.

Figure 2.12: Percentage of Laurea Triennale Graduates (equivalent to bachelor of science) out of Enrolments by Intake

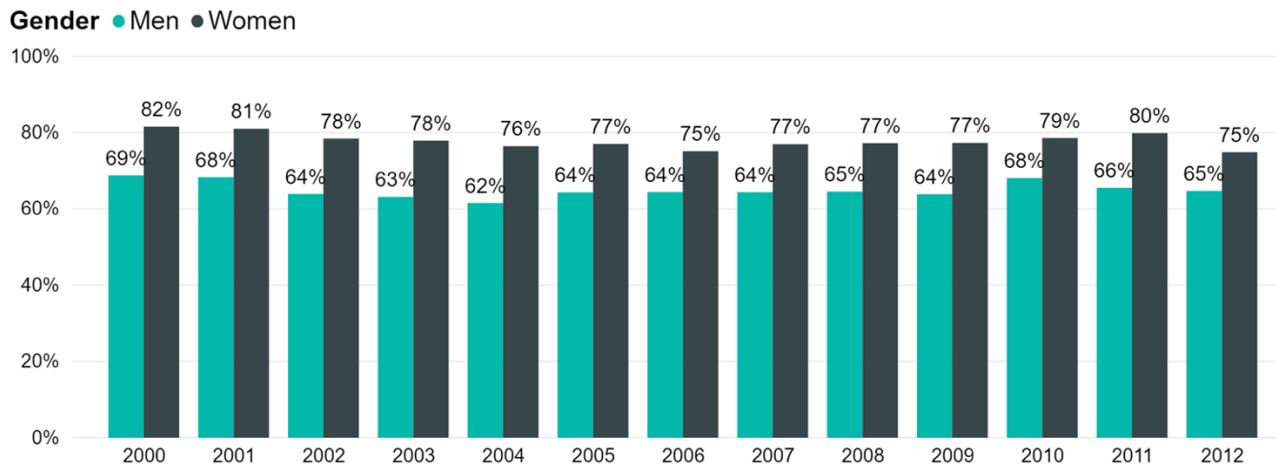
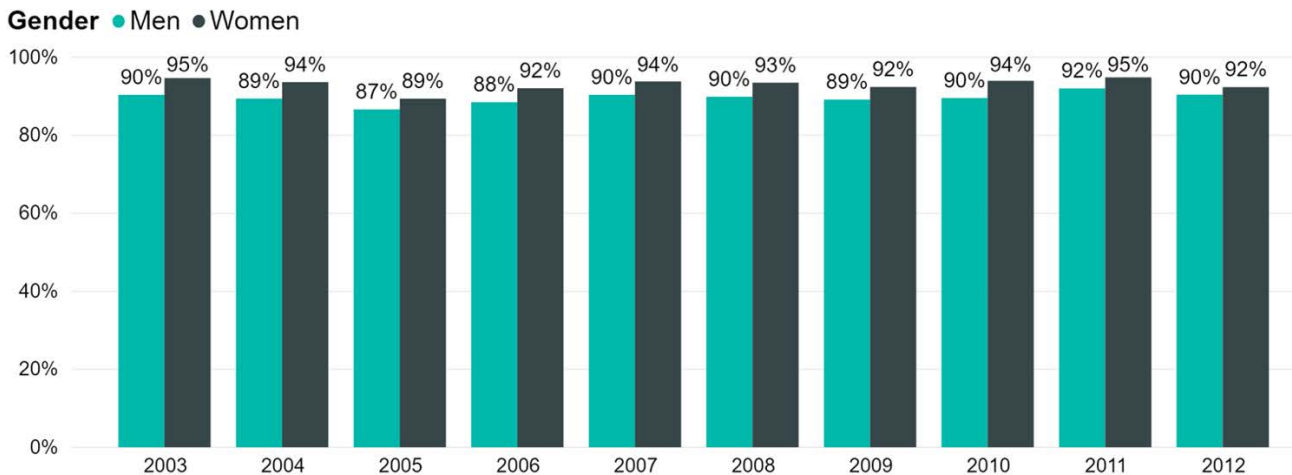


Figure 2.13: Percentage of Laurea Magistrale Graduates (equivalent to master of science) out of Enrolments by Intake



This is confirmed in all three areas, as we can see from Tables 2.10, 2.11 and 2.12, which show the total number of bachelor’s and master’s graduates, and the percentages of graduates, compared to enrolments. Oddly enough, keeping in mind that the incidence of the female population on the total is very different in all three areas, we notice a basically constant significant difference (mean of ca. 10% on the various intakes analysed for the Laurea Triennale (equivalent to bachelor of science) and of at least 4% for the Laurea Magistrale (equivalent to master of science)) between the percentage of female graduates vs. female enrolments, and the same percentage referred to men, with a net prevalence of women.

Table 2.10: Number of Graduates and Percentage of Graduates out of Enrolments by Type of Laurea (equivalent to bachelor/master of science) – Engineering

Engineering										
Intake	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no	no.	%	no	%	no
2000	2570	67.67	495	78.57	3,065	-	-	-	-	-
2001	2514	67.36	557	79.80	3,071	-	-	-	-	-
2002	2319	62.10	520	73.14	2,839	-	-	-	-	-
2003	2292	60.59	517	71.51	2,809	1505	90.99	359	93.98	1,864
2004	2319	59.01	590	74.03	2,909	1862	90.48	468	94.74	2,330
2005	1902	61.73	483	72.85	2,385	1996	87.01	576	90.57	2,572
2006	1910	61.40	484	72.13	2,394	1645	88.49	469	93.61	2,114
2007	1914	62.63	550	73.73	2,464	1636	90.74	484	94.53	2,120
2008	2128	62.10	615	69.18	2,743	1714	90.16	515	92.46	2,229
2009	2276	61.48	673	70.62	2,949	1705	89.22	532	93.33	2,237
2010	2392	66.37	671	74.31	3,063	1697	89.69	587	94.07	2,284
2011	2422	63.91	687	76.00	3,109	1926	92.60	681	96.32	2,607
2012	2665	62.84	797	71.54	3,462	2021	90.75	712	93.44	2,733

Table 2.11: Number of Graduates and Percentage of Graduates out of Enrolments by Type of Laurea (equivalent to bachelor/master of science) - Architecture

Architecture										
Intake	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no	no.	%	no	%	no
2000	507	69.93	616	80.73	1,123	-	-	-	-	-
2001	532	69.72	549	79.80	1,081	-	-	-	-	-
2002	525	68.90	581	81.15	1,106	-	-	-	-	-
2003	524	68.86	584	80.66	1,108	353	89.59	437	95.00	790
2004	515	71.03	614	76.27	1,129	415	87.92	459	94.25	874
2005	592	69.65	638	79.06	1,230	501	88.05	519	89.79	1,020
2006	564	70.50	590	77.12	1,154	305	90.77	427	91.43	732
2007	562	69.13	644	80.00	1,206	370	93.67	478	95.03	848
2008	528	70.97	692	80.65	1,220	431	92.09	594	95.65	1,025
2009	527	70.08	635	81.51	1,162	464	92.43	554	94.86	1,018
2010	553	71.82	677	79.55	1,230	483	90.79	667	93.55	1,150
2011	543	71.73	685	82.33	1,228	480	91.60	663	95.81	1,143
2012	491	71.26	627	75.63	1,118	505	90.83	682	91.79	1,187

Table 2.12: Number of Graduates and Percentage of Graduates out of Enrolments by Type of Laurea (equivalent to bachelor/master of science) – Design

Design										
Intake	Laurea Triennale (equivalent to Bachelor of Science)					Laurea Magistrale (equivalent to Master of Science)				
	Men		Women		Total	Men		Women		Total
	no.	%	no.	%	no.	no.	%	no.	%	no.
2000	302	77.63	324	88.52	626	-	-	-	-	-
2001	285	74.80	300	85.96	585	-	-	-	-	-
2002	307	70.74	367	82.66	674	-	-	-	-	-
2003	321	75.71	408	83.27	729	193	86.94	263	94.95	456
2004	272	69.57	430	80.37	702	253	84.33	274	90.73	527
2005	285	73.45	415	79.20	700	256	81.27	344	86.87	600
2006	284	76.96	402	76.14	686	174	84.47	297	90.55	471
2007	263	68.67	447	76.94	710	132	78.57	291	90.65	423
2008	238	76.53	428	85.77	666	153	81.38	263	90.69	416
2009	218	78.42	391	83.91	609	161	80.10	245	85.37	406
2010	228	79.72	434	84.60	662	164	84.54	278	94.56	442
2011	188	71.21	425	82.68	613	141	85.45	285	89.34	426
2012	222	76.82	391	81.12	613	141	84.43	304	91.02	445

### 2.3.1 GRADUATION MARK

To complete the analysis of the training pathway of the Laurea Triennale and Magistrale (equivalent to bachelor/master of science) programmes, we shall now focus on the graduation mark, which is a primary *performance unit* of the student population. As we see in Tables 2.13, 2.14 and 2.15, which report the data relative to graduation marks attained in the three Areas of Engineering, Architecture and Design for the 2012 intake, the mean marks vary as the area considered changes, anyhow remaining always less for Laurea Triennale programmes, compared to the Laurea Magistrale ones. On average, the Engineering Area records lower mean marks than other areas. Regarding enrolments for the academic year 2012-2013, the mean mark for the School of Engineering was approx. 94/110 points for the Laurea Triennale and approx. 102/110 points for the laurea magistrale, rising to approx. 101/110 points and 106/110 points, respectively, for Laurea Triennale and Magistrale in Architecture and Design (which have very similar mean marks). The Laurea Triennale in Engineering and Laurea Magistrale in Design also presented a greater dispersion of marks, as evidenced in the box plots in Figures 2.14 and 2.15.

Table 2.13: Mean Graduation Mark - 2012 Intake - Engineering

Engineering						
	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
<b>No. of observations</b>	2665	797	3.462	2021	712	2.733
<b>Min Mark</b>	74	78	74	77	75	75
<b>Max Mark</b>	110	110	110	110	110	110
<b>Mean Mark</b>	93.71	94.50	93.89	102.08	103.19	102.37
<b>Variance</b>	70.77	60.67	68.54	20.73	21.91	21.56

Table 2.14: Mean Graduation Mark - 2012 Intake - Architecture

Architecture						
	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
<b>No. of observations</b>	491	627	1.118	505	682	1.187
<b>Min Mark</b>	80	85	80	85	83	83
<b>Max Mark</b>	110	110	110	110	110	110
<b>Mean Mark</b>	100,30	102,03	101,27	105,42	106,72	106,17
<b>Variance</b>	42,91	31,88	37,42	25,10	18,64	21,79

Table 2.15: Mean Graduation Mark - 2012 Intake - Design

Design						
	Laurea Triennale (equivalent to Bachelor of Science)			Laurea Magistrale (equivalent to Master of Science)		
	Men	Women	Total	Men	Women	Total
<b>No. of observatio</b>	222	391	613	141	304	445
<b>Min. mark</b>	86	83	83	90	80	80
<b>Max. mark</b>	110	110	110	110	110	110
<b>Mean mark</b>	99.60	101.02	100.51	105.94	106.53	106.34
<b>Variance</b>	38.60	31.93	34.75	52.90	45.60	51.21

Figure 2.14: Box Plot Laurea Triennale (equivalent to bachelor of science) Marks - 2012 Intake

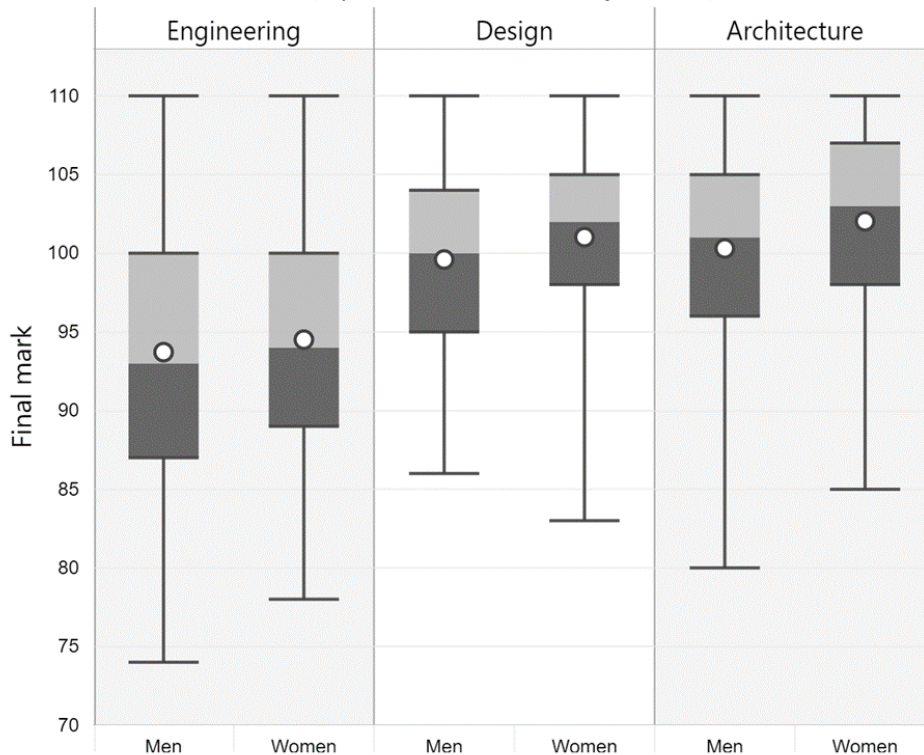
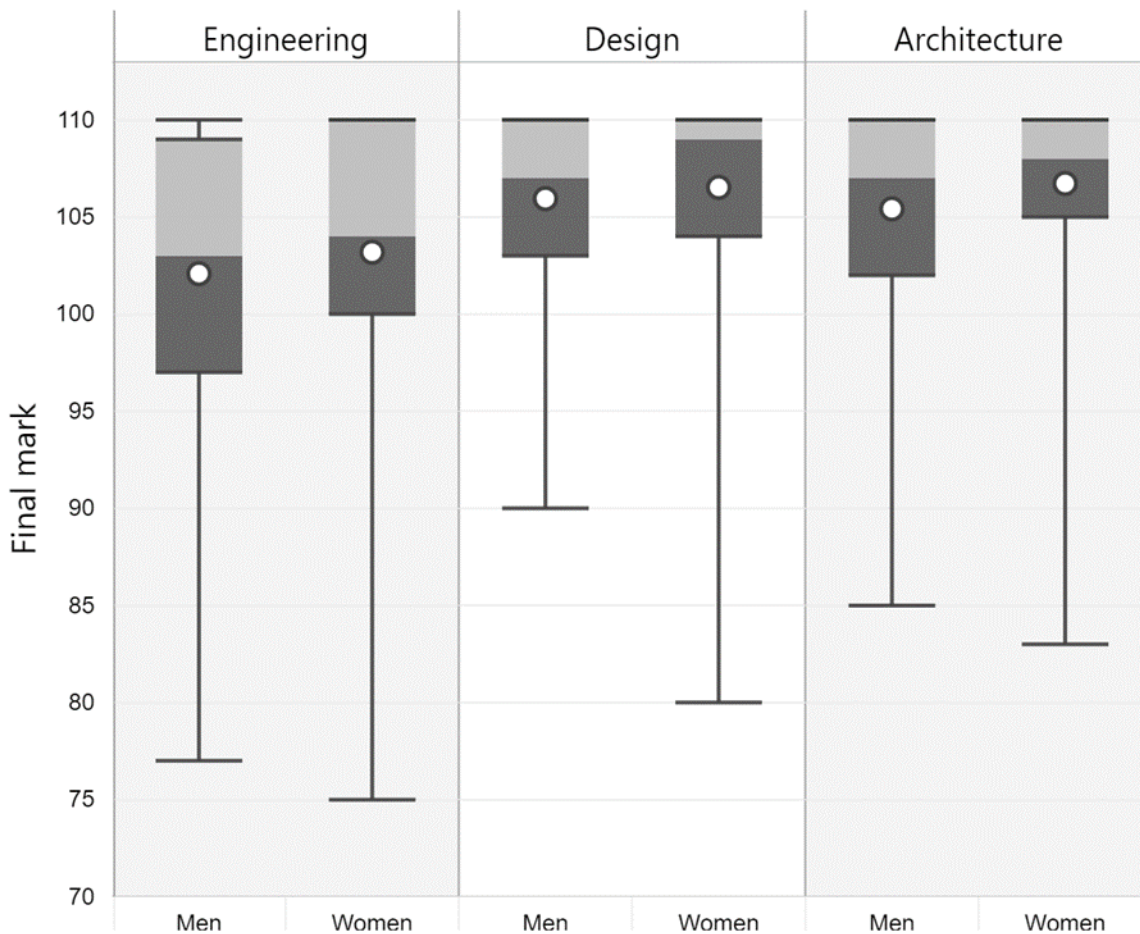


Figure 2.15: Box Plot Laurea Magistrale (equivalent to master of science) Marks - 2012 Intake



Observing the evolution of graduation marks in the course of time, reported in Figures 2.16 and 2.17 for Laurea Triennale (equivalent to bachelor of science) and Laurea Magistrale (equivalent to master of science) programmes in Engineering, 2.18 and 2.19 for Architecture, 2.20 and 2.21 for Design, it is evident that they presented fluctuations in the range of 92-95 for Laurea Triennale programmes in Engineering and in the range of 103-105 for Laurea Magistrale programmes; for Architecture the variation ranges were 95-102 for Laurea Triennale programmes and 104-107 for Laurea Magistrale programmes, which are similar to those for Design (97-103 for the Triennale and 102-107 for the Magistrale). It must be said that in all three Areas, in all years of observation, both for the Laurea Triennale and for the Laurea Magistrale, the mark attained at the graduation by female students was consistently higher, on average, than the one attained by male students. The difference presents a stable fluctuation between 1 and 2 points for Laurea Triennale and Magistrale programmes in Engineering. This difference becomes slightly broader in the case of Laurea Triennale programmes in Architecture, while it diminishes for the Laurea Magistrale, with a pattern resembling the one observed for Design. In other words, female graduates in Engineering obtained a stably higher performance than their male colleagues; the same occurred, but with fewer differences, for female graduates in Architecture and Design. As in the above cases, namely analyses of study programme duration and of withdrawals, it seems that female students who enter a predominantly male environment, such as laurea (equivalent to bachelor of science) programmes in Engineering, are more motivated, and this leads to better overall performance.

Figure 2.16: Mean Mark of Laurea Triennale (equivalent to bachelor of science) by Intake - Engineering

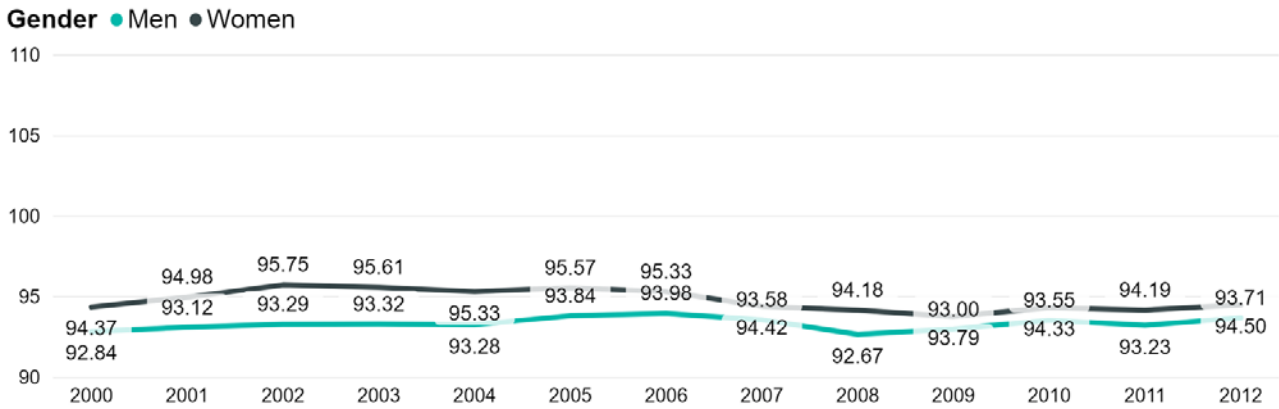


Figure 2.17: Mean Mark of Laurea Magistrale (equivalent to master of science) by Intake - Engineering

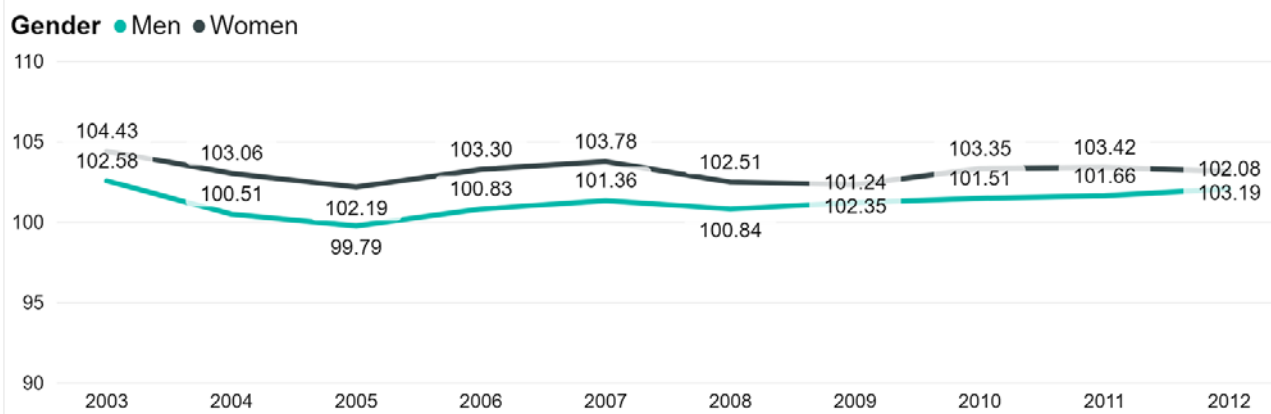


Figure 2.18: Mean Mark of Laurea Triennale (equivalent to bachelor of science) by Intake - Architecture

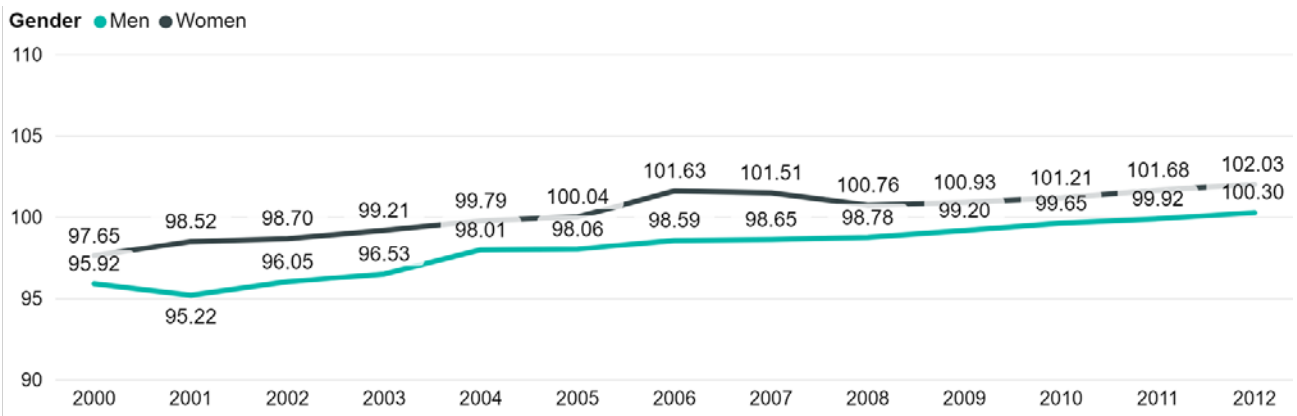




Figure 2.19: Mean Mark of Laurea Magistrale (equivalent to master of science) by Intake – Architecture

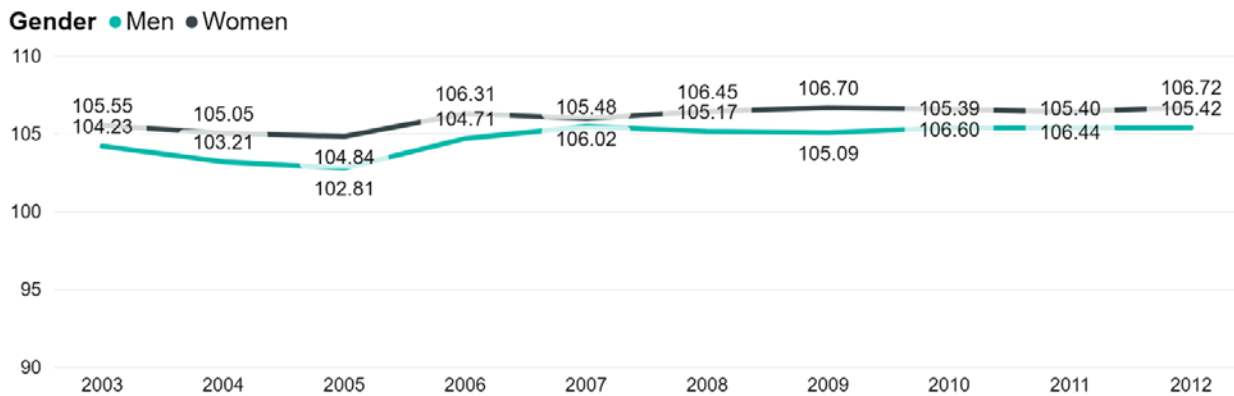


Figure 2.20: Mean Mark of Laurea Triennale (equivalent to bachelor of science) by Intake - Design

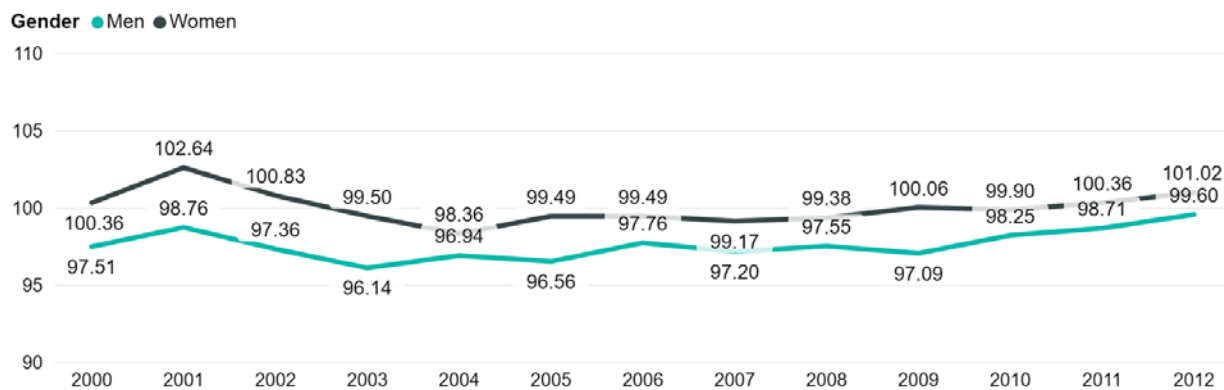
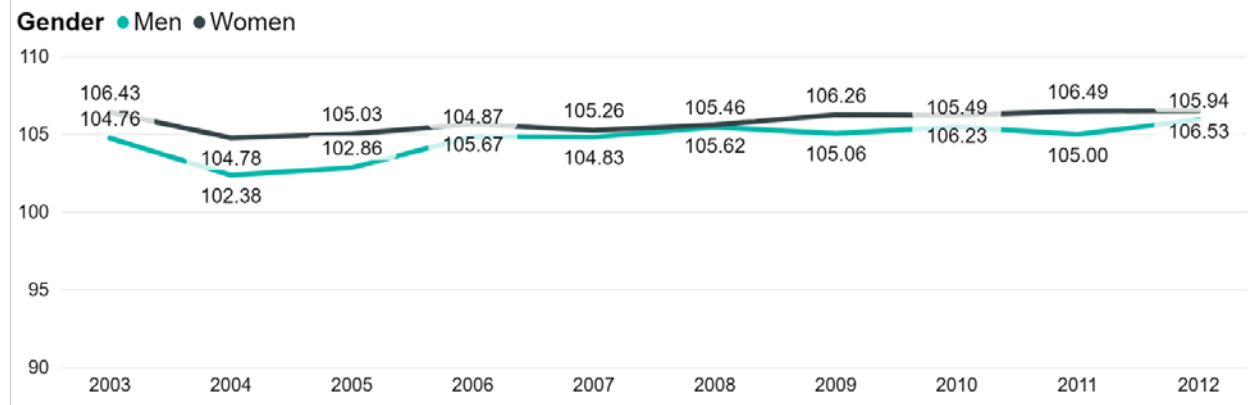


Figure 2.21: Mean Mark of Laurea Magistrale (equivalent to master of science) by Intake - Design



The performance of male and female students is more heterogeneous in the three areas, if we consider the percentage of those who were awarded honours at the graduation examination. In the case of Engineering (Table 2.16), this percentage is in the range of 3-6% for the Laurea Triennale (equivalent to bachelor of science) and of 10-16% for the Laurea Magistrale (equivalent to master of science). Both the triennale and magistrale study programmes present a reversal in the trend in recent years. Particularly, the percentage of female students who graduated with honours, which was stably higher than that of male colleagues for enrolments prior to the academic year 2006-2007 (with the exception of the academic year 2000-2011), was stably lower for female students, compared to male students in the subsequent academic years. A similar pattern was presented by the honours attained at the Laurea Magistrale, which were more for female students than for male students for enrolments until 2009-2010, and then become lower starting from 2010-2011. Despite the due precautions, the above results could be one of the effects of the preference female students have for study programmes in Engineering. That is, in time, access to these study programmes became more or less equal, attracting not only the best performing and most motivated female students but

a broader female population, which obtains good marks that are not necessarily excellent.

Table 2.16: Number and percentage of honours attained by graduates by intake – Engineering

Engineering												
Intake	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%
2000	143	5.56	25	5.05	168	5.48	-	-	-	-	-	-
2001	142	5.65	34	6.10	176	5.73	-	-	-	-	-	-
2002	146	6.30	45	8.65	191	6.73	-	-	-	-	-	-
2003	117	5.10	35	6.77	152	5.41	237	15.75	72	20.06	309	16.58
2004	96	4.14	31	5.25	127	4.37	224	12.03	62	13.25	286	12.27
2005	106	5.57	27	5.59	133	5.58	228	11.42	75	13.02	303	11.78
2006	92	4.82	26	5.37	118	4.93	217	13.19	59	12.58	276	13.06
2007	98	5.12	24	4.36	122	4.95	196	11.98	76	15.70	272	12.83
2008	81	3.81	24	3.90	105	3.83	184	10.74	65	12.62	249	11.17
2009	95	4.17	21	3.12	116	3.93	218	12.79	69	12.97	287	12.83
2010	119	4.97	24	3.58	143	4.67	216	12.73	69	11.75	285	12.48
2011	100	4.13	24	3.49	124	3.99	216	11.21	76	11.16	292	11.20
2012	119	4.47	32	4.02	151	4.36	268	13.26	94	13.20	362	13.25

Architecture, instead, seems to present a different scenario (Table 2.17). For Laurea Triennale (equivalent to bachelor of science) programmes, female students have stably better performance than male students starting from academic year 2005-2006, even with evident differences. This tendency is enhanced for Laurea Magistrale (equivalent to master of science) courses, where the percentage of honours attained by female students is stably higher than that of honours attained by male students; with the exception of academic year 2005-2006, in which the difference in honours attained by male and female enrolled students is very small: women enrolled for that academic year obtain honours in 11.18% of cases vs. 11.38% of their male colleagues.

Table 2.17: Number and percentage of honours attained by graduates by cohort – Architecture

Architecture												
Intake	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%	no.	%
2000	9	1.78	10	1.62	19	1.69	-	-	-	-	-	-
2001	10	1.88	10	1.82	20	1.85	-	-	-	-	-	-
2002	16	3.05	18	3.10	34	3.07	-	-	-	-	-	-
2003	9	1.72	33	5.65	42	3.79	40	11.33	74	16.93	114	14.43
2004	26	5.05	31	5.05	57	5.05	33	7.95	64	13.94	97	11.10
2005	19	3.21	39	6.11	58	4.72	57	11.38	58	11.18	115	11.27
2006	19	3.37	37	6.27	56	4.85	46	15.08	96	22.48	142	19.40
2007	23	4.09	52	8.07	75	6.22	57	15.41	83	17.36	140	16.51
2008	15	2.84	31	4.48	46	3.77	57	13.23	135	22.73	192	18.73
2009	20	3.80	31	4.88	51	4.39	63	13.58	130	23.47	193	18.96
2010	23	4.16	33	4.87	56	4.55	91	18.84	158	23.69	249	21.65
2011	31	5.71	42	6.13	73	5.94	92	19.17	164	24.74	256	22.40
2012	32	6.52	47	7.50	79	7.07	98	19.41	149	21.85	247	20.81

The progress of Laurea Triennale (equivalent to bachelor of science) programmes in Design is similar to that of Engineering (Table 2.18) where female enrolments for academic years prior to 2006-2007 perform better than male enrolments, with the exception of academic year 2004-2005, then obtaining worse results in the last three academic years surveyed. However, the data now discussed must be evaluated with caution, since they were observed on a very small sample: for example, out of the enrolments for academic year 2007-2008, there were only 12 graduates with honours, out of which 3 males and 9 females. The progress, in time, was more fluctuating for the Laurea Magistrale (equivalent to master of science) with percentages at times higher and at times lower between male and female students, depending on the years. Always with some caution, this fluctuating progress can be seen as a reflection of the enhanced gender equality that characterises the study programme in Design. This course attracts, to a greater extent, female students. The effect of greater motivation can thus be used in this case for male enrolments attaining a comparable and, at times, higher number of honours over the years, than female colleagues.

Table 2.18: Number and percentage of honours attained by graduates by intake – Design

Design												
Intake	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	no.	%	no.	%	no.	%	no.	%	no.	%	n	%
2000	12	3.97	17	5.25	29	4.63	-	-	-	-	-	-
2001	15	5.26	30	10.00	45	7.69	-	-	-	-	-	-
2002	7	2.28	12	3.27	19	2.82	-	-	-	-	-	-
2003	9	2.80	13	3.19	22	3.02	13	6.74	30	11.41	43	9.43
2004	8	2.94	7	1.63	15	2.14	16	6.32	31	11.31	47	8.92
2005	4	1.40	10	2.41	14	2.00	18	7.03	39	11.34	57	9.50
2006	9	3.17	17	4.23	26	3.79	12	6.90	37	12.46	49	10.40
2007	3	1.14	9	2.01	12	1.69	19	14.39	38	13.06	57	13.48
2008	6	2.52	9	2.10	15	2.25	19	12.42	25	9.51	44	10.58
2009	4	1.83	13	3.32	17	2.79	20	12.42	38	15.51	58	14.29
2010	7	3.07	9	2.07	16	2.42	25	15.24	34	12.23	59	13.35
2011	12	6.38	17	4.00	29	4.73	21	14.89	50	17.54	71	16.67
2012	8	3.60	7	1.79	15	2.45	30	21.28	48	15.79	78	17.53

## 2.4 THE POSTGRADUATE PATHWAY

This section describes the postgraduate pathway of male and female students at Politecnico di Milano. The first part discusses the Research Doctorate, which is the final training phase during which the person is still at university, and still qualifies as a student. Since the Research Doctorate is a necessary step to undertake the academic career, it is interesting to evaluate its distribution by gender to get an idea of the inclination to undertake this career. The section is then completed with an analysis of occupational data obtained from questionnaires administered to graduates by the Politecnico's Career Service, in partnership with the Study Service and the AlumniPolimi Association<sup>11</sup>.

<sup>11</sup> The Career Service (<http://www.careerservice.polimi.it/en-US/Home/Index/>) within the Area of Development and Relations with Companies of Politecnico di Milano ensures student *employability* with *career advisory* events and services, management of relations with companies and implementation of occupational investigations. Study Service staff belong to the General Management that, among various activities, processes miscellaneous statistical data.

These data present the efficacy of the university's study pathways to enable access to the job market, and an early analysis of any discrepancies in treatment between men and women from an occupational standpoint at the onset of the career.

#### 2.4.1 RESEARCH DOCTORATE

Politecnico di Milano currently offers 19 Research Doctorate pathways, out of which 14 in the Area of Engineering, 4 in the Area of Architecture and 1 in the Area of Design. The data presented below refer, where not otherwise specified, to enrolments to doctoral programmes from the twenty-eighth cycle (started in 2012) to the thirty-third cycle (started in 2017)<sup>12</sup>. It has been noticed that the percentage of female enrolments to doctoral programmes in Engineering has varied in the course of time (Table 2.19), remaining within an interval 26-30% through the years. For Research Doctorates, Politecnico di Milano's situation shows a slightly lower female presence at Engineering than the national mean, as described in the MIUR's document "Le carriere femminili in ambito accademico" [Women's academic careers], which reports, a percentage of 34.6% of women enrolled to the Research Doctorate in Engineering and Technology for academic year 2016-2017. After all, this can be due to the presence of laurea (equivalent to bachelor of science) programmes in the sector of "Technology", which include study programmes with a higher female presence than purely engineering programmes. If we consider foreign universities partnering Idea League that have collected comparable data, we notice that, in 2018, TU Delft has a population of male and female PhD students with 28.2% of women, ETH 31.1%, while at RTWH Aachen women account for 31.95% of PhD students in 2018, with only 16.18% of women attending the doctoral programme in engineering disciplines offered by the university (i.e., Civil Engineering, Mechanical Engineering, Electrical Engineering and Information Engineering, even at Politecnico di Milano, which is among those presenting an overall lower female presence).

The percentage of women enrolling in the research doctorate in Architecture is higher (Table 2.20) and, apart from the abnormal case of the twenty-ninth cycle, has varied in the interval 55-63%. Female presence is rather high even at the research doctorate in Design (Table 2.21) where percentages must, however, be evaluated considering the small number of the population observed. Overall it can be concluded that in all three Areas, the progress of enrolments on the part of female students was fluctuating, with the least representation of the female population in the Area of Engineering, compared to the areas of Architecture and Design, thus reflecting the situation in the previous phases of the study cycle.

*Table 2.19: Number and Percentage of Enrolments to the Doctoral Programme by Research Doctorate Cycle and Gender - Engineering*

Cycle	Engineering				Total no.
	Men		Women		
	no.	%	no.	%	
28	209	73.08	77	26.92	286
29	214	70.16	91	29.84	305
30	235	74.84	79	25.16	314
31	166	70.34	70	29.66	236
32	169	72.84	63	27.16	232
33	216	70.36	91	29.64	307

In particularly to support strategic planning. The AlumniPolimi association is the Association of Politecnico di Milano's Graduates.

<sup>12</sup> Data include transfers to other Universities and exclude early withdrawals (within two months after enrolment).

Table 2.20: Number and Percentage of Enrolments to the Doctoral Programme by Research Doctorate Cycle and Gender - Architecture

Architecture					
Cycle	Men		Women		Total
	no.	%	no.	%	no.
28	23	37.10	39	62.90	62
29	35	59.32	24	40.68	59
30	24	41.38	34	58.62	58
31	23	40.35	34	59.65	57
32	27	45.00	33	55.00	60
33	24	41.38	34	58.62	58

Table 2.21: Number and Percentage of Enrolments to the Doctoral Programme by Research Doctorate Cycle and Gender - Design

Design					
Cycles	Men		Women		Total
	no.	%	no	%	no.
28	6	35.29	11	64.71	17
29	4	21.05	15	78.95	19
30	4	21.05	15	78.95	19
31	6	30.00	14	70.00	20
32	1	8.33	11	91.67	12
33	6	40.00	9	60.00	15

Focusing on students who have actually attained a Research Doctorate, it can be noticed that, in the period 2012-2018<sup>13</sup>, data recall the percentages observed between enrolments. Female PhD students attending Engineering programmes (Table 2.22) have a 30% lower percentage, except for the years 2013 (34.08%) and 2016 (31.80%). The percentage of Female PhD students in Architecture is higher, exceeding 60% in the years 2012-2014 and 2016 (Table 2.23). Percentages of female PhD students in Design, about whom it can doubtless be said that they constantly represent the large majority of those who have attained a qualification in this area is high, but again hard to evaluate considering the problem of the small number, as shown in Table 2.24.

Table 2.22: Number and Percentage of PhD Holders by Calendar Year and by Gender - Engineering

Engineering					
Year	Men		Women		Total
	no.	%	no.	%	no.
2012	116	75.32	38	24.68	154
2013	147	65.92	76	34.08	223
2014	215	70.72	89	29.28	304
2015	145	74.74	49	25.26	194
2016	163	68.20	76	31.80	239
2017	191	73.18	70	26.82	261
2018	186	73.81	66	26.19	252

<sup>13</sup> Data include those who have moved to other Universities but who account for a negligible percentage of the total.

Table 2.23: Number and Percentage of PhD Holders by Calendar Year and by Gender - Architecture

Architecture					
Year	Men		Women		Total
	no.	%	no.	%	no.
2012	19	38.78	30	61.22	49
2013	23	35.38	42	64.62	65
2014	25	34.25	48	65.75	73
2015	32	45.71	38	54.29	70
2016	19	38.00	31	62.00	50
2017	22	44.00	28	56.00	50
2018	24	45.28	29	54.72	53

Table 2.24: Number and Percentage of PhD Holders by Calendar Year and by Gender - Design

Design					
Year	Men		Women		Total
	no.	%	no.	%	no.
2012	8	42.11	11	57.89	19
2013	4	40.00	6	60.00	10
2014	11	45.83	13	54.17	24
2015	2	20.00	8	80.00	10
2016	6	37.50	10	62.50	16
2017	3	20.00	12	80.00	15
2018	3	25.00	9	75.00	12

The results of male and female students attending doctoral programmes were evaluated considering the number of honours attained with the qualification. Male and female students in the area of Engineering attained the PhD qualification with honours in a percentage that varies over the years in the interval of 30-40%, as shown in Table 2.25. Differences between the results of male and female students in the area of Engineering do not show a specific pattern: in some years female students received more honours than their male counterparts, in other years the reverse occurred.

Table 2.25: Number and Percentage of Honours attained by PhD Holders, by Calendar Year and by Gender - Engineering

Engineering					
Year	Men		Women		Total
	no.	%	no.	%	no.
2012	38	32.76	12	31.58	50
2013	48	32.65	23	30.26	71
2014	66	30.70	29	32.58	95
2015	45	31.03	19	38.78	64
2016	48	29.45	27	35.53	75
2017	63	32.98	19	27.14	82
2018	67	36.02	26	39.39	93

The variability in the number of honours awarded over the years is higher for Architecture, see Table 2.26. In this case female students obtained a higher percentage of honours than male students in the years 2012, 2015 and 2018, while the reverse occurred in the other years. Moreover, the differences between the two groups are broader, exceeding 10 percentage points (in 2017 and in 2018).

*Table 2.26: Number and Percentage of Honours attained by PhD Holders, by Calendar Year and by Gender - Architecture*

Year	Architecture				
	Men		Women		Total
	no.	%	no.	%	no.
2012	4	21.05	8	26.67	12
2013	11	47.83	15	35.71	26
2014	12	48.00	15	31.25	27
2015	7	21.88	9	23.68	16
2016	6	31.58	9	29.03	15
2017	11	50.00	10	35.71	21
2018	10	41.67	15	51.72	25

The small number makes it hard to interpret the number of honours in doctoral programmes in Design, which are, however, reported for exhaustiveness in Table 2.27.

*Table 2.27: Number and Percentage of Honours attained by PhD Holders, by Calendar Year and by Gender - Design*

Year	Design				
	Men		Women		Total
	no.	%	no	%	no.
2012	3	37.50	4	36.36	7
2013	2	50.00	4	66.67	6
2014	2	18.18	8	61.54	10
2015	1	50.00	2	25.00	3
2016	0	0.00	5	50.00	5
2017	2	66.67	4	33.33	6
2018	2	66.67	2	22.22	4

## 2.4.2 EMPLOYABILITY OF FEMALE STUDENTS FROM POLITECNICO DI MILANO

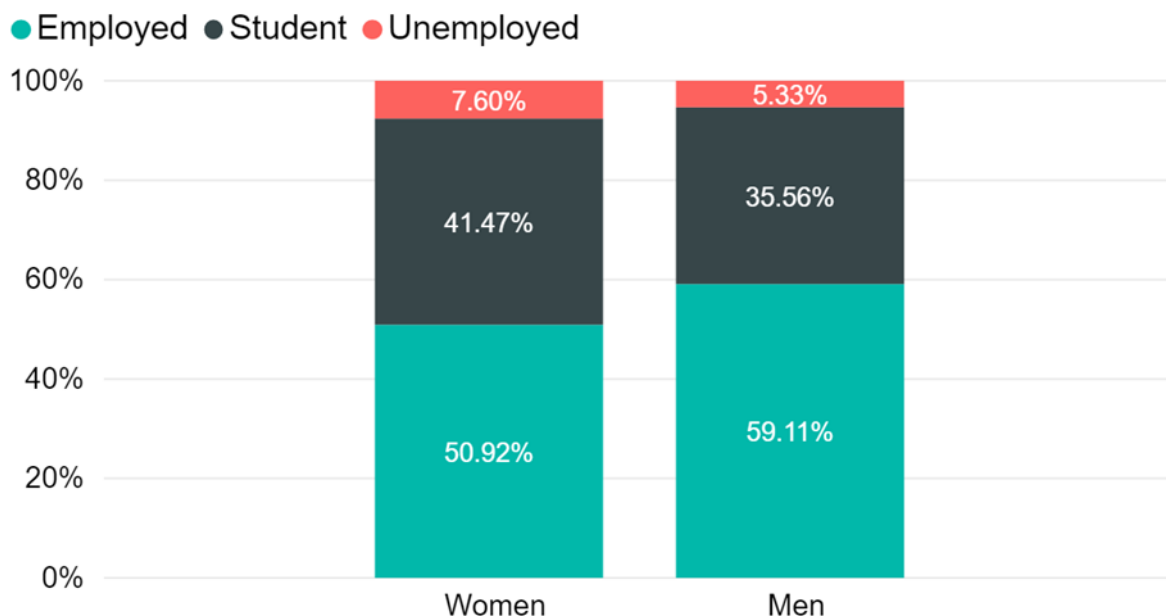
In 2018 Politecnico di Milano conducted an employability survey on people who had attained a qualification at the university in the year 2016. The survey particularly addressed students who had attained a Laurea Triennale (equivalent to bachelor of science) and who had decided not to continue studies at Politecnico di Milano, those who had attained a Laurea Magistrale (equivalent to master of science) or a Research Doctorate. For the Laurea Magistrale and Research Doctorate, the survey was administered to both Italian and foreign graduates, while only Italian students were considered for the Laurea Triennale. The analysis concerns employment status, type of employment contract (permanent vs. fixed term) and wages.

## EMPLOYMENT STATUS OF STUDENTS WHO ATTAINED A LAUREA TRIENNALE (equivalent to bachelor of science) IN 2016

The question regarding employment status (“Can you tell me exactly what your occupational status is?”) was answered by 1,241 persons with Laurea Triennale out of 1,657 to whom the survey was sent. The rate of response to this question and this population was, therefore, 75.52%. The sample of 1,241 respondents represents the population of those who attained a Laurea Triennale in 2016 and did not continue their studies at Politecnico di Milano. This implies, as mentioned in the introductory notes, that the results obtained on the sample can be generalised to the population from which the population was extracted.

Data in Figure 2.22 show that a lower percentage of women, compared to men, find employment one year after Graduation: 50.92% of the female graduates with a Laurea Triennale vs. 59.11% of their male colleagues. Women, instead, prevail among those who study<sup>14</sup> (41.47% vs. 35.56%), but also among those who have no employment (7.60% vs. 5.33%). These differences in the sample of respondents to the question of the analysis were statistically significant, allowing generalisation of the results to the reference population. Briefly, female graduates with a Laurea Triennale who do not continue studies at Politecnico di Milano are, compared to their male counterparts, more inclined to continue studying and have more difficulty finding employment. This reflects the evidence that also surfaces in the scientific literature and which, in a broad sense, shows that women present a higher inclination to continue academic studies and greater difficulty finding work (see, for instance, Blau F., Ferber M., 2018, *The Economics of Women, Men and Work*). However, while the difference between men and women regarding the continuation of studies is evident, the one relative to the unemployment status is decidedly smaller. Generally speaking, data relative to the number of persons who have not found employment seem to be rather positive, the percentage of graduates with a laurea triennale who one year after graduation has no employment being 6.12%, which is lower than the national data for the year 2018 (10.6%).

*Figure 2.22: Employment by Gender of Graduates attaining a Laurea Triennale (equivalent to bachelor of science) in 2016 at one year after Graduation – Polimi all (1,241 respondents)*



If we consider the disaggregated data of the three areas, shown in Figure 2.23, the area of Engineering is the one in which differences between men and women are most evident.

<sup>14</sup> Students are those who continue to attend a degree programme (triennale or magistrale) outside Politecnico di Milano, or those who attend a university master’s degree, a doctoral programme or a non-university course.

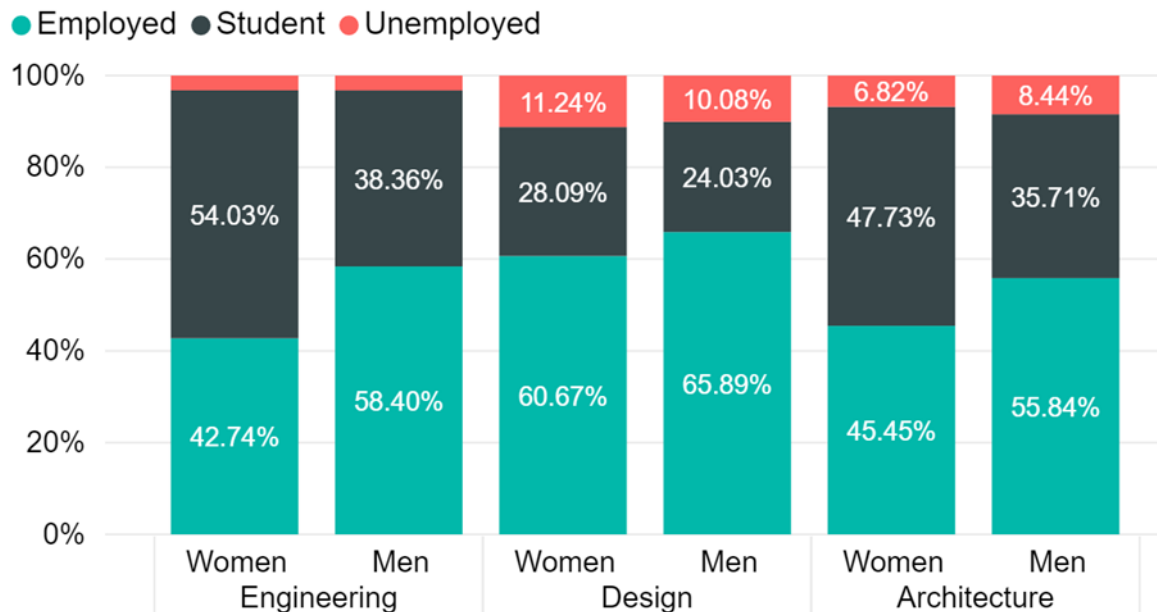


In fact, only 42.74% of female graduates with a bachelor's degree in Engineering find employment twelve months after graduation, compared to 58.40% for male graduates, with a difference of more than 15 percentage points. The difference between 54.03% of female graduates who are studying, compared to only 38.36% of male graduates, is equally broad. The percentage of male and female unemployed subjects is comparable and certified around 3% (3.23% for women and 3.24% for men). Briefly, for the Engineering area, data seem to indicate a different choice between men and women at the end of the Laurea Triennale: the major part of men enters the job market, while the major part of women continues to study. As expected, these differences too were statistically significant.

The differences between men and women are, instead, less evident for those graduating from Laurea Triennale programmes in Architecture. With reference to this area of studies, 45.45% of female graduates work vs. 55.84% of male graduates, with a difference of 10 percentage points that diminish to 8 in the case of those who continue studying (35.71% of women and 47.73% of men), while the percentages of men and women who have no employment presents a difference of less than two percentage points: 6.82% and 8.44%, respectively.

The differences further diminish for the area of Design, whose working graduates record a percentage of less than 5 points, compared to male graduates (60.67% vs. 65.89%), and study in a greater percentage: 28.09% vs. 24.03%, with a difference of only 4 percentage points, instead, presenting percentages that are only slightly higher, if we consider those who have no employment (11.24% vs. 10.08%).

Figure 2.23: Employment by Gender of Graduates attaining a Laurea Triennale (equivalent to bachelor of science) in 2016 at one year after Graduation – Detail of Areas (1,241 respondents)

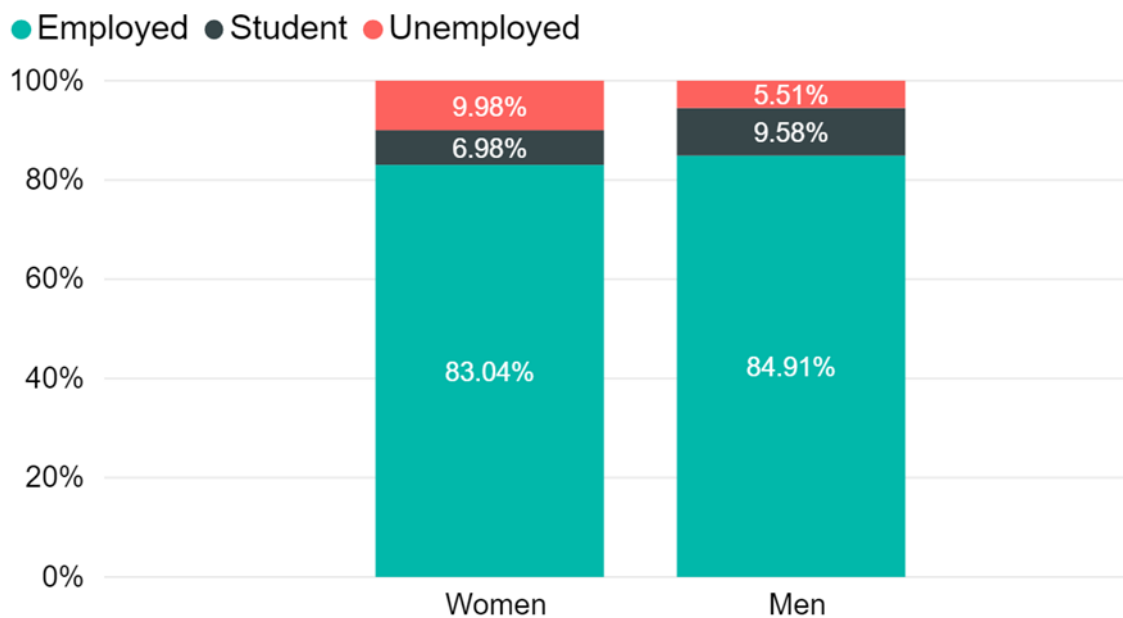


#### EMPLOYMENT STATUS OF THOSE WHO ATTAINED A LAUREA MAGISTRALE (equivalent to master of science) IN 2016

Figure 2.24 reports the results of the question on the employment status addressed to those who attained a Laurea Magistrale at Politecnico di Milano in 2016. The 3,464 respondents are 72.34% out of the 4,788 to whom the survey was administered. The sample of these respondents is representative by geographical area and area of studies (Engineering, Architecture and Design); instead, it is not representative by gender, as women are slightly fewer in the sample, compared to the population to whom the survey was administered. However, this under-representation was verified to be smaller and with no impact at all in practice on the

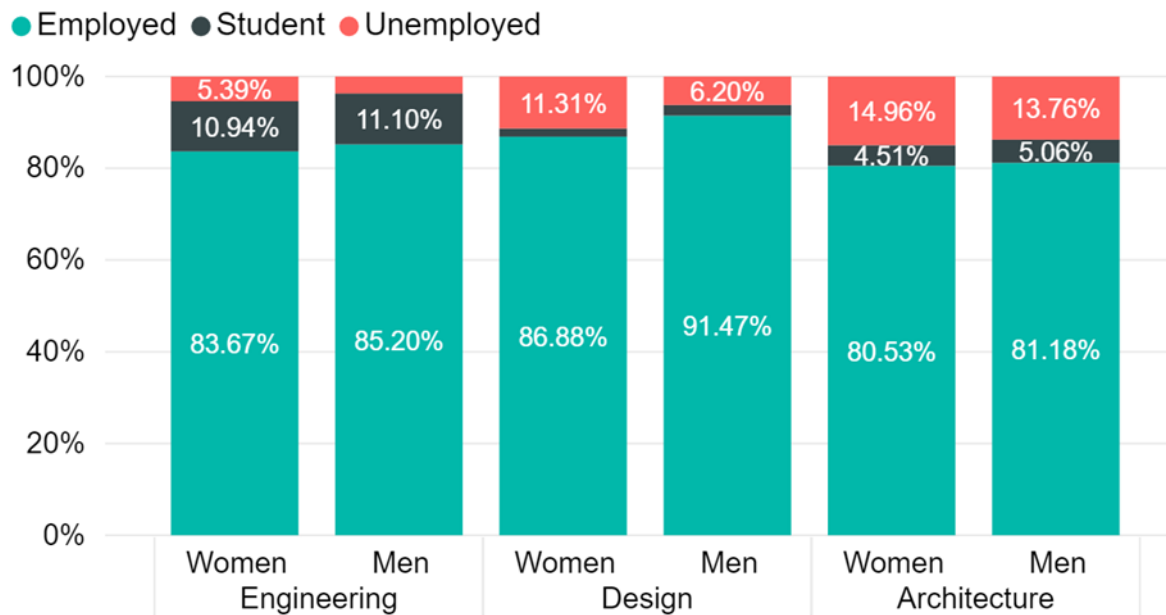
final results (see the introductory notes again). Hence, the results without adjusting the sample are given below. Compared to the situation observed above regarding those who attained a Laurea Triennale (equivalent to bachelor of science), the differences between men and women in the employment status were rather less evident, though they are statistically significant. The percentages of employed subjects remain very good. At one year after attaining a Laurea Magistrale (equivalent to master of science) at Politecnico di Milano, 84.21% of those who responded to the survey have found employment. Particularly, 83.04% of female graduates has found employment vs.84.91% of male graduates, women continue to study in a higher percentage (9.58% vs. 6.98%). It is interesting to observe that a difference of almost 5 percentage points surfaces between men and women regarding those who still have no employment. Almost 10% of women and less than 6% of men are unemployed at one year after graduation. The disadvantage of women regarding access to the Job Market, which was minimum at the time of the Laurea Triennale, expands when they reach the Laurea Magistrale, when continuing to study understandably becomes a less attractive option, and women have reached the age, presumably between 24 and 30 years, at which the possibility of forming a family becomes either concrete or perceived as such.

Figure 2.24: Employment by Gender of Graduates attaining a Laurea Magistrale (equivalent to master of science) in 2016 at one year after Graduation (3,464 respondents)



Observe the detail of study areas shown in Figure 2.25, the differences between employed men and women are less evident for the area of Engineering (83.67% vs. 85.20%) and Architecture (81.18% vs. 80.53%), and slightly more evident in the area of Design (86.88% vs. 91.47%). Moreover, while those who have no employment are mostly unemployed for Architecture and Design, the male and female non-employed subjects in Engineering are mostly studying. Moreover it surfaces that women who have no employment are almost two-fold the percentage of men in the same condition for Design (11.31% vs. 6.20%) and Engineering (5.39% vs. 3.70%), while the percentage is comparable in Architecture (13.76% vs. 14.96%), where both sexes find it harder to enter the job market.

Figure 2.25: Employment by Gender of Graduates attaining a *Laurea Magistrale* (equivalent to master of science) in 2016 at one year after Graduation – Detail of Areas (3,464 respondents)



#### EMPLOYMENT STATUS OF THOSE WHO ATTAINED A RESEARCH DOCTORATE IN 2015 AND IN 2016

The employment data of those who attained a Research Doctorate, see Figure 2.26, is calculated on 460 answers out of the total number of subjects (579) to whom the questionnaire was administered. The response rate to this question and this population was 79.45%. The sample is representative for gender but not for area of studies and geographical area. In fact, subjects who attained a research doctorate in the Area of Design and those from foreign countries are slightly under-represented. As mentioned above, the under-representation is minor and, hence, the decision to present the data without corrections. Compared to the negligible percentage of those who still study after the Research Doctorate (0.34% of men and 0.60% of women), a difference of almost 6 percentage points (89.9% vs. 95.5%) surfaces among employed subjects, along with a percentage of women seeking employment that is more than two-fold the number recorded for men (4.12% vs. 9.52%). This difference is statistically significant. The Research Doctorate generally prepares for an academic career or for a career in research centres and, despite the need for due caution, data can be interpreted as an indication of the greater difficulty experienced by women, compared to men, in obtaining such a position (e.g., post-doctoral offers or positions as *assistant professor*) in universities and research centres. The *leaky pipeline*<sup>15</sup> that characterises women's careers in science seems to already commence from here. This consideration is underpinned by the detail of the professional framework in which male and female PhD graduates are employed, as reported in Figure 2.27. Proportionately, a higher number of male PhD graduates (95.5%) succeeds in continuing the academic career, compared to their female counterparts (89.9%). The differences in employability of male and female PhD graduates must be interpreted also considering the age group of this population: approx. 30 years. This is the age when, in Italy, the major part of women gets married (in 2015 the mean age of the first marriage for women was 32 years according to ISTAT), and has a child (always according to ISTAT, in 2015 the mean age of women at the birth of children was 31.7 years).

<sup>15</sup> "The leaky pipeline": the metaphor widely used to indicate how women leave the job market or remain blocked at the lowest levels of managerial and academic hierarchies at every step of their career.

Hence, the age when the burden of family duties becomes significant for women seems to have repercussions on access to the job market also for those who have reached the highest levels of studies.

Figure 2.26: Occupation by Gender at one year after attaining the qualification of PhD Holders in 2016 – Polimi all (460 respondents)

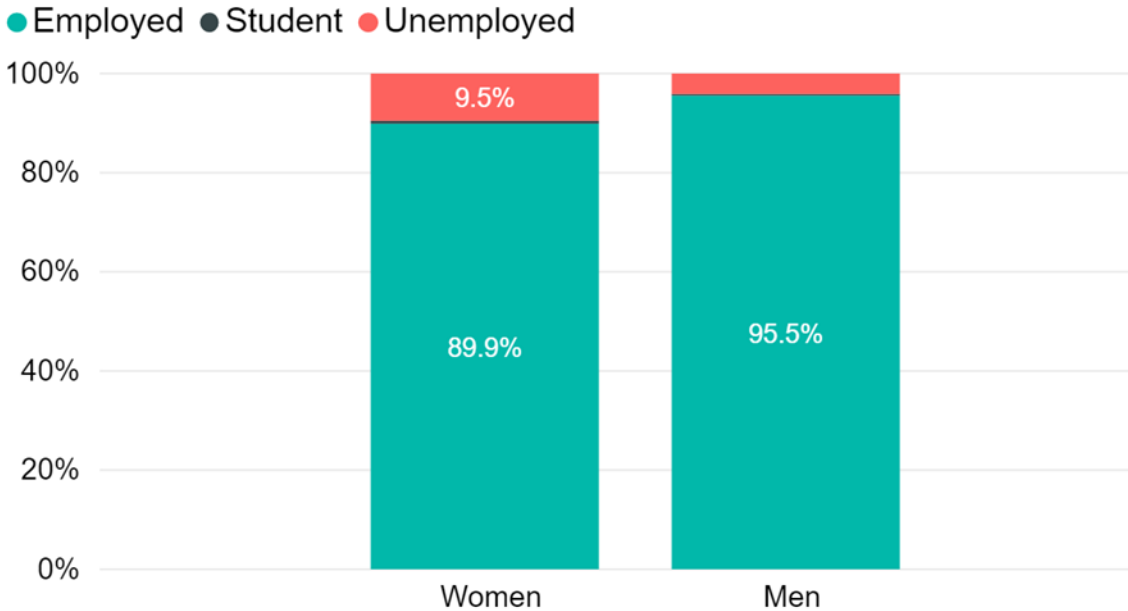
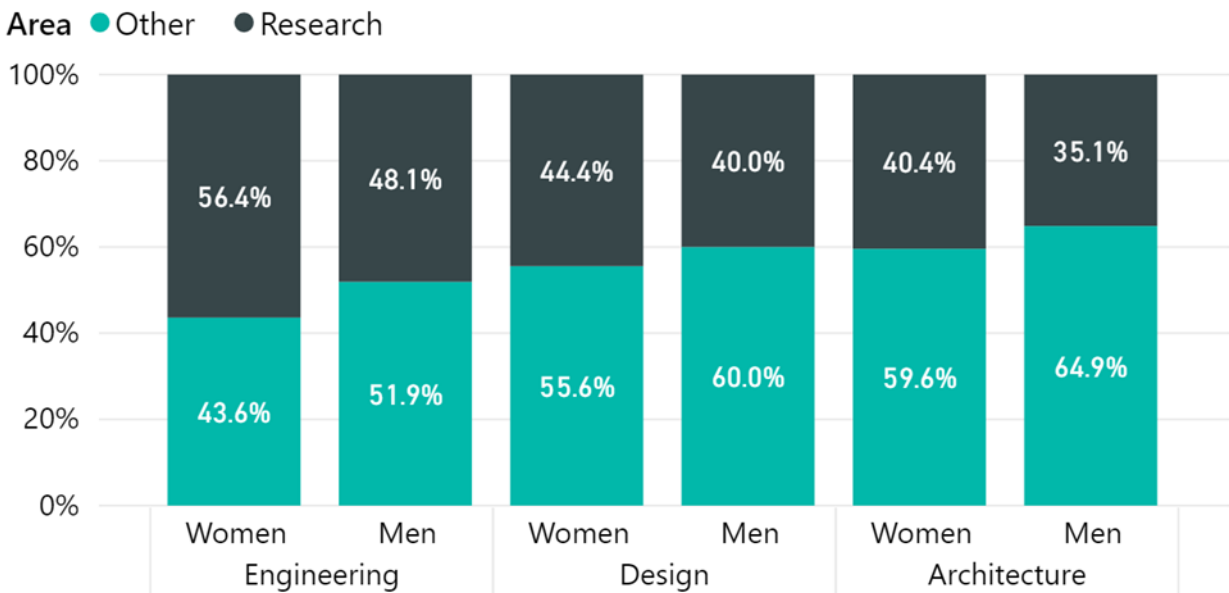
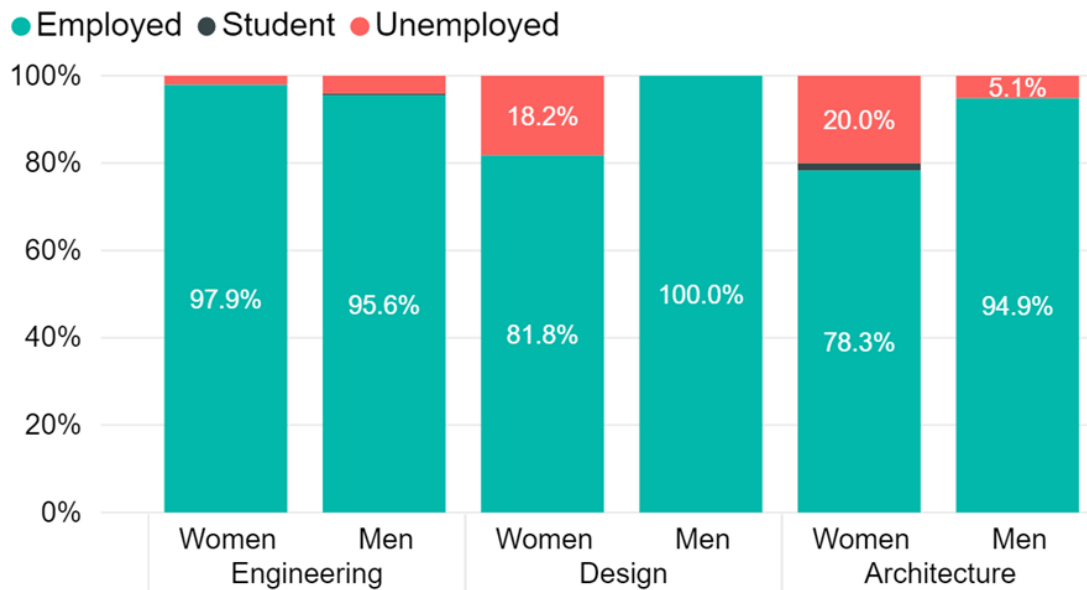


Figure 2.27: Employability for PhD Holders (427 respondents)



Data disaggregation for areas analysed in Figure 2.28 shows that the most evident differences between genders especially concern Architecture and Design. In fact, in these areas, the differences between non-employed male and female subjects are particularly evident, though the interpretation of data must take into account the small number of the population, which prevented statistical tests. In particular, for the Design area the sample includes 11 women and 5 men, while for Architecture the sample includes 60 women and 39 men.

Figure 2.28 Employment by Gender at one year after attaining the qualification of PhD Holder – Detail of Areas (460 respondents)



#### TYPE OF EMPLOYMENT CONTRACT AND SALARY GRADE OF SUBJECTS WHO HAVE ATTAINED A QUALIFICATION AT POLITECNICO DI MILANO

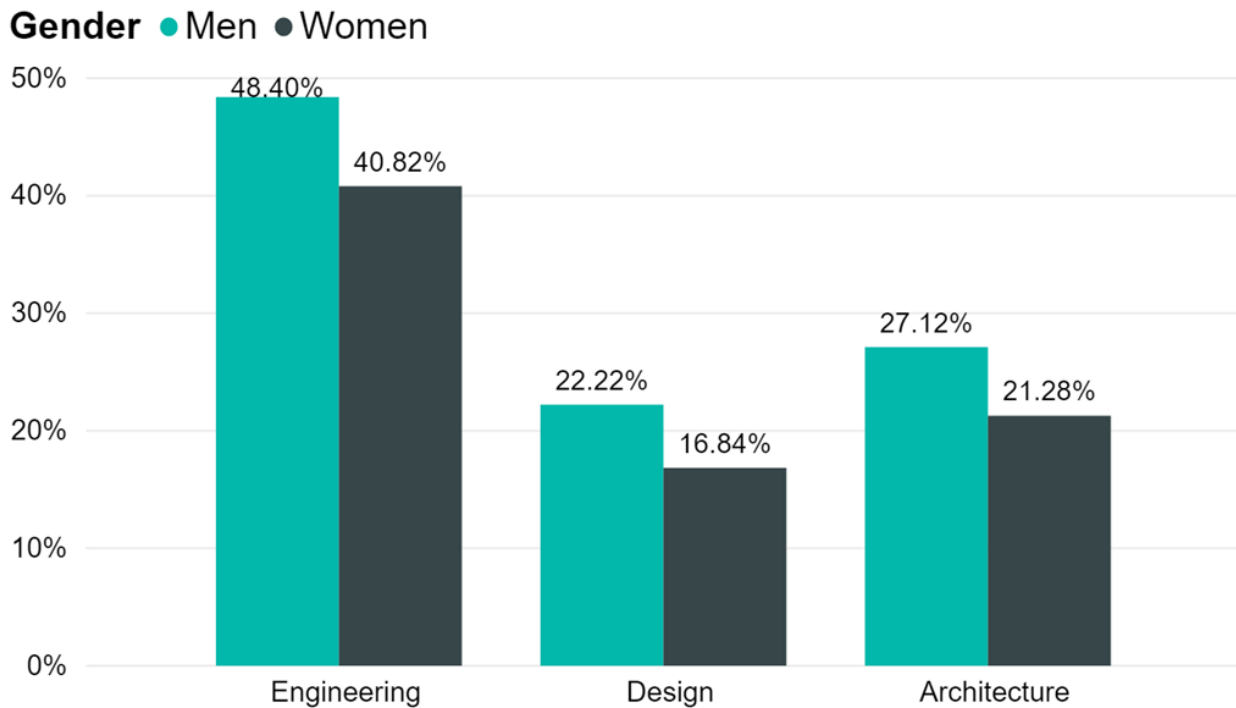
Subjects who attained a Laurea Triennale or Magistrale (equivalent to bachelor/master of science) in 2016 and declared that they found employment were asked to specify the type of employment contract. For simplification purposes, the various answer options were classified by distinguishing between permanent contracts and fixed term contracts<sup>16</sup>. Regarding the Laurea Triennale, 594 answers were obtained out of a total of 698 persons to whom the question was placed. The response rate to this question and this population was 85.10%. This sample is representative of the population to whom the question was placed, in terms of gender (Fisher's Exact Test = 0.598); however, it is not representative of the study area and geographical origin. In fact, subjects from North Italy outside Lombardy are under-represented, while those who have attended an Engineering programme are slightly over-represented. The percentage of those who have a permanent contract is higher for men (41.19%) than for women (24.08%). A difference of more than 16 percentage points, which is statistically significant, indicates that female graduates have more difficulty finding stable employment than their male colleagues.

Distinguishing between the three study areas, Figure 2.29 reveals that the percentage of subjects with a permanent contract is significantly higher for male and female graduates in Engineering (the percentage of graduates with a permanent contract is, in fact, overall 47.27% at Engineering vs. 18.99% and 24.53% for Design and Architecture, respectively). This evidence is related to the specificities of the professions associated with Architecture and Design where forms of employment, such as self-employment, are rather common. It has also been observed that the discrepancy between men and women in this type of contracts (see Figure 2.29) is typical of all areas: it is almost 8 percentage points for Engineering (40.82% for women vs. 48.40% for men), and drops to less than 6 percentage points for Design (16.84 vs. 22.22%) and Architecture (21.28% vs. 27.12%).

<sup>16</sup> Particularly, both full time and part time contracts belong to the category of permanent contracts. Fixed term contracts include both full time and part time, reintegration contracts, apprenticeship, temporary employment, project-based/coordinated and ongoing employment, occasional professional services and training contracts/work experience.

However, the difference between men and women with a permanent contract is statistically significant only in the area of Engineering. Conversely, the difference is not statistically significant in the areas of Architecture and Design.

Figure 2.29: Percentage of Permanent Contracts of Graduates attaining the Laurea Triennale (equivalent of bachelor of science) in 2016 (594 respondents)

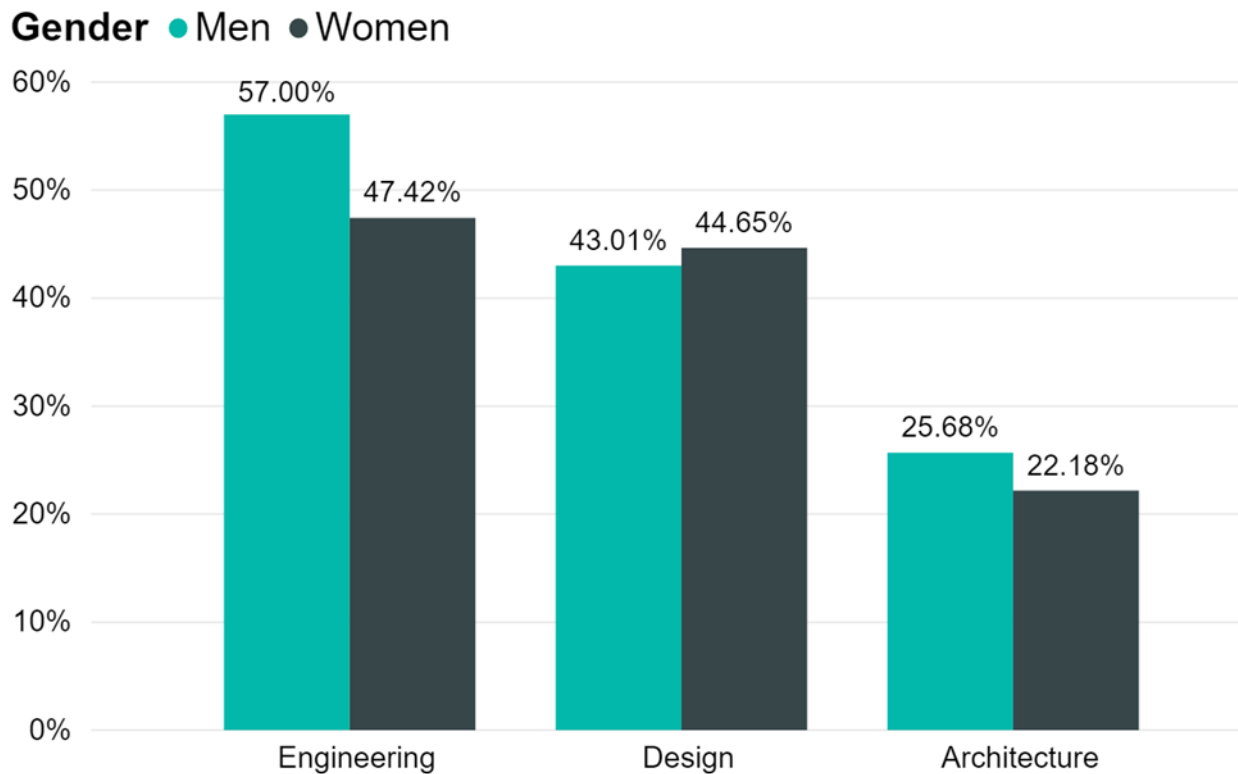


Switching to male and female graduates attaining the Laurea Magistrale (equivalent to master of science), 2,493 subjects responded to the question on the type of contract out of 2,917 of those to whom the question was placed. The response rate is, therefore, 85.46% in this case. The percentage of those who have a permanent contract is 54.53% for Engineering, 44.05% for Design and 23.64% for Architecture. The discrepancy between men and women overall for the Politecnico is 13 percentage points: 52.64% vs. 39.57% for women. This difference is statistically significant, thus showing the greater difficulty experienced by women, even with high human capital, to achieve a stable employment status. The diminishing difference between men and women in the transition from Laurea Triennale and Laurea Magistrale (from approx. 16 to approx. 13 percentage points) seems to suggest that women are more penalised when they are younger and have lower qualifications. Evidence seems to move in the direction of underscoring the cumulative effect of two potentially disadvantageous conditions (young age and being a woman)<sup>17</sup>.

If we distinguish between three study areas (see Figure 2.30), we notice that the above discussed discrepancy is basically to be blamed on the area of Engineering, where the difference between men and women who have a permanent contract is approx. 10 percentage points (47.42% vs. 57.00%), and is statistically significant. The differences become very slender and lack statistical significance for the areas of Architecture and Design. Differences in trend observed in the three areas can be related to the different degree of horizontal segregation in the industries and in the frameworks of competence that absorb male and female graduates in the three areas. In fact, while male and female graduates in Engineering are absorbed by sectors, such as mechanics, chemistry, aerospace, in which the major part of workers are men, male and female graduates in Architecture and Design typically find work in more equal sectors and frameworks. Literature reports the greater difficulty experienced by women in obtaining equal employment and salary conditions in traditionally male environments (see again Blau F., Ferber M., 2018, *The Economics of Women, Men and Work*).

<sup>17</sup> The sum of conditions of potential disadvantage is a phenomenon known in literature as intersectionality.

Figure 2.30: Percentage of Permanent Contracts of Graduates attaining the Laurea Magistrale (equivalent of master of science) in 2016 (2,493 respondents)



Finally, male and female graduates, both from the Laurea Magistrale and Triennale, were requested to specify their net monthly wages by choosing from “less than 1,000 € a month”, “between 1,001 € and 1,500 €”, “between 1,501 € and 2,000 €”, “between 2,001 € and 3,000 €”, “over 3,000 €”. As indicated in the data in Table 2.28, both for Laurea Triennale and for Laurea Magistrale, women are proportionately more present in lower income categories.

Table 2.28: Net monthly wages of Graduates one year after Graduation

Engineering												
Income category	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	n°	%	n°	%	n°	%	n°	%	n°	%	n°	%
Up to 1000€	21	7.47%	6	12.00%	27	8.16%	54	4.05%	34	7.23%	88	4.88%
From 1,001 to 1,500€	149	53.02%	27	54.00%	176	53.17%	540	40.51%	235	50.00%	775	42.98%
From 1,501 to 2,000€	73	25.98%	14	28.00%	87	26.28%	525	39.38%	152	32.34%	677	37.55%
From 2,001 to 3,000€	31	11.03%	3	6.00%	34	10.27%	156	11.70%	42	8.94%	198	10.98%
Over 3,000€	7	2.49%	0	0.00%	7	2.11%	58	4.35%	7	1.49%	65	3.61%
<b>Total</b>	<b>281</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>331</b>	<b>100%</b>	<b>1333</b>	<b>100%</b>	<b>470</b>	<b>100%</b>	<b>1803</b>	<b>100%</b>

Architecture												
Income category	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	n°	%	n°	%	n°	%	n°	%	n°	%	n°	%
Up to 1,000€	17	25.37%	16	32.00%	33	28.21%	104	39.69%	156	45.88%	260	43.19%
From 1,001 to 1,500€	29	43.28%	26	52.00%	55	47.01%	79	30.15%	134	39.41%	213	35.38%
From 1,501 to 2,000€	15	22.39%	6	12.00%	21	17.95%	46	17.56%	27	7.94%	73	12.13%
From 2,001 to 3,000€	5	7.46%	1	2.00%	6	5.13%	27	10.31%	16	4.71%	43	7.14%
Over 3,000€	1	1.49%	1	2.00%	2	1.71%	6	2.29%	7	2.06%	13	2.16%
<b>Total</b>	<b>67</b>	<b>100%</b>	<b>50</b>	<b>100%</b>	<b>117</b>	<b>100%</b>	<b>262</b>	<b>100%</b>	<b>340</b>	<b>100%</b>	<b>602</b>	<b>100%</b>

Income category	Design											
	Laurea Triennale (equivalent to Bachelor of Science)						Laurea Magistrale (equivalent to Master of Science)					
	Men		Women		Total		Men		Women		Total	
	n°	%	n°	%	n°	%	n°	%	n°	%	n°	%
Up to 1000€	29	37.66%	44	45.83%	73	42.20%	11	10.28%	47	26.26%	58	20.28%
From 1,001 to 1,500€	35	45.45%	44	45.83%	79	45.66%	52	48.60%	90	50.28%	142	49.65%
From 1,501 to 2,000€	10	12.99%	4	4.17%	14	8.09%	30	28.04%	27	15.08%	57	19.93%
From 2,001 to 3,000€	2	2.60%	4	4.17%	6	3.47%	12	11.21%	13	7.26%	25	8.74%
Over 3,000€	1	1.30%	0	0.00%	1	0.58%	2	1.87%	2	1.12%	4	1.40%
<b>Total</b>	<b>77</b>	<b>100%</b>	<b>96</b>	<b>100%</b>	<b>173</b>	<b>100%</b>	<b>107</b>	<b>100%</b>	<b>179</b>	<b>100%</b>	<b>286</b>	<b>100%</b>

Regarding the Laurea Triennale, 621 graduates responded out of 698 (88.97%). 15.76% of students earn less than 1,000 €. This percentage rises to 33.67% in the case of female students. The percentage of those who earn more than 3,000 € is 2.12% for male students and only 0.51% for female students. The differences reported are statistically significant.

For the Laurea Magistrale, the number of subjects who responded rises to 2,691, namely 92.25% of those to whom this question was placed (2,917). 23.96% of respondents earn less than 1,000 €, this percentage drops below 10% for men (9.93%). Conversely, the percentage of subjects who earn more than 3,000 €, however small, is two-fold for men (3.88%) vs. women (1.62%). Likewise, 91.20% of women earn less than 2,000 €, while 84.66% of men are in the same situation. The above differences were all statistically significant.

The pay gap between men and women, which is an invariance in statistics on wages, is thus confirmed for subjects who have obtained a qualification at Politecnico di Milano.

This pay gap is especially high for female students of Engineering and Architecture. 7.23% of graduates with a Laurea Magistrale (equivalent to master of science) in Engineering earn less than 1,000 €, compared to 4.03% of Engineers, while 4.35% of male Engineers and only 1.49% of female Engineers earn more than 3,000 €. The differences are once again statistically significant. The wages of subjects who have attained a Laurea (equivalent to bachelor of science) in Architecture seems on average lower: while only 4.88% of male and female graduates in Engineering earn less than 1,000 €, this percentage rises to 43.19% for Architecture. The lowest income category includes 45.88% of female graduates in Architecture vs. 39.69% of male graduates. Percentages are reversed in the highest income category: 6.71% of women and 12.6% of men earn more than 2,000 €. The differences seem to be less evident if we consider subjects who have attained a Laurea Magistrale (equivalent to master of science) in Design, though these differences are statistically less significant. 26.26% of female graduates earn less than 1,000 € vs. 10.28% male graduates, while the difference is less evident, though always present (8.38% of women vs. 13.08% of men) for those who earn more than 3,000 €.

As indicated by data in Table 2.29, even in the case of PhD holders we notice, though to a lesser degree, the same pattern observed for male graduates. The small number of the population does not allow more detailed analyses.

Table 2.29: Net monthly wages of PhD Holders one year after attaining the qualification

Income category	Engineering					
	Men		Women		Total	
	n°	%	n°	%	n°	%
Up to 1,000€	7	3.14%	4	4.71%	11	3.57%
From 1,001 to 1,500€	28	12.56%	19	22.35%	47	15.26%
From 1,501 to 2,000€	94	42.15%	38	44.71%	132	42.86%
From 2,001 to 3,000€	63	28.25%	15	17.65%	78	25.32%
From 3,001 to 4,000€	18	8.07%	7	8.24%	25	8.12%
Over 4,000€	13	5.83%	2	2.35%	15	4.87%
<b>Total</b>	<b>223</b>	<b>100%</b>	<b>85</b>	<b>100%</b>	<b>308</b>	<b>100%</b>



Architecture						
Income category	Men		Women		Total	
	n°	%	n°	%	n°	%
Up to 1,000€	2	5.88%	8	19.51%	10	13.33%
From 1,001 to 1,500€	12	35.29%	20	48.78%	32	42.67%
From 1,501 to 2,000€	14	41.18%	11	26.83%	25	33.33%
From 2,001 to 3,000€	2	5.88%	0	0.00%	2	2.67%
From 3,001 to 4,000€	1	2.94%	2	4.88%	3	4.00%
Over 4,000€	3	8.82%	0	0.00%	3	4.00%
<b>Total</b>	<b>34</b>	<b>100%</b>	<b>41</b>	<b>100%</b>	<b>75</b>	<b>100%</b>

Design						
Income category	Men		Women		Total	
	n°	%	n°	%	n°	%
Up to 1,000€	0	0%	0	0%	0	0%
From 1,001 to 1,500€	0	0%	4	44%	4	29%
From 1,501 to 2,000€	5	100%	4	44%	9	64%
From 2,001 to 3,000€	0	0%	1	11%	1	7%
From 3,001 to 4,000€	0	0%	0	0%	0	0%
Over 4,000€	0	0%	0	0%	0	0%
<b>Total</b>	<b>5</b>	<b>100%</b>	<b>9</b>	<b>100%</b>	<b>14</b>	<b>100%</b>

This chapter provided a detailed description of the student population of Politecnico di Milano, considering the entire career, from the entrance test right up to graduation, with a sectional view of access to the job market. Obviously, the analysis was carried out from a gender-based perspective to highlight differences between men and women in this pathway.

Briefly summarising the key points of the data, the following can be observed:

- considering the university overall and the period 2000-2017, a slow but continuous rise in female enrolments can be noticed, shifting from 26.37% in the academic year 2000-2001 to 34.42% of 2017-2018;
- the situation of the three areas of the university is highly diversified: in the academic year 2017-2018 female enrolments in Architecture programmes were 57.84% of the total, in Design 60.97% and in Engineering 22.69%
- in all three areas, and both in the laurea triennale and in the magistrale (with the exception of a few sporadic fluctuations), the rates of female withdrawals were consistently lower than those of men, and the percentages of female graduates out of all enrolled subjects are higher;
- the analysis of the mean graduation marks too shows a slightly but stably higher performance in women than in men; the analysis of the postgraduate pathway reveals a population of enrolments to the Research Doctorate that is consistent, in terms of percentage values, with that of students attending laurea programmes (in the last cycle, the thirty-third, female enrolments to the Research Doctorate in Architecture were 58.62% of the total, in Design 60.00% and in Engineering 29.64%;
- finally, shifting to monitor the parameters of access to the job market, it is evident that at 12 months after the laurea magistrale (equivalent to the master of science) women generally had more difficulty finding employment than their male colleagues in all three areas, with more evident differences in the area of Design; at Engineering, particularly, at 12 months after graduation female graduates have a significantly lower percentage of permanent contracts (57.00% of men have one vs. 47.42% of women) and, generally, lower wages (the pay gap particularly affects all three areas). Given the

ANALYSIS OF THE STUDENT

sample considered, this pay gap seems scarcely justifiable with objective factors, considering the identical academic origin of the sample considered and the fact that female performance was in line with, if not better than, that of males.



### 3. ANALYSIS OF PROFESSORS

This chapter reports data on professors at Politecnico di Milano<sup>18</sup>, with special focus on composition by gender, careers, performance measured in terms of scientific productivity and of technological transfer activities (patents and *spin-offs*). Particularly, the presentation of the data of the whole university is followed by an analysis of the gender dynamics of the twelve Departments comprising the university and of its Governing Bodies.

#### 3.1 THE FACULTY AT POLITECNICO DI MILANO

On 31 December 2018, 1,403 professors, namely 403 women and 1,000 men, were in service at Politecnico di Milano; the female population was, therefore, 28.7% of the total. The comparison of this data against the national situation is not simplified by the specific disciplines of the university. As we could expect, being a technical university, the percentage of female professors is below the national percentage of 40.2%<sup>19</sup>, as per the MIUR's report headed "Focus sulle carriere femminili" ("Focus on female careers") (2019). The percentage of female professors at the Politecnico is also less than the 36% mentioned by the above MIUR report for STEM areas. However, this divergence is supposedly related to the fact that STEMs also include disciplines where women are well represented (e.g., biological sciences), which are not present among the scientific/disciplinary sectors of professors at the Politecnico. Also considering IdeaLeague's partner universities, the comparison is not instantly evident for the different definition of the Faculty adopted by the various universities. In 2018, TU Delft has 26% of women in the scientific staff, however, also including Post-Doctoral researchers; on 31 December 2017, the Faculty at RWTH Aachen, once again spanning *non-tenured* levels to *full professors*, counts 32.04% of women, while ETH in Zurich has 15.1% of women in its *permanent scientific staff*, which only include *associates* and *full professors*, and 30.6% *temporary* staff.

Table 3.1 shows the evolution of female presence in the Faculty, from 2000 to 2018. We notice that the percentage of women has steadily increased in time, reaching little less than 10% overall from 2000 to 2018.

Table 3.1: Evolution of Faculty by Gender from 2000 to 2018

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>No.</b>	202	217	249	242	245	296	305	315	341	334
<b>% Women</b>	19.8%	20.3%	21.7%	21.3%	21.6%	23.3%	23.7%	24.1%	24.4%	24.3%
<b>No. Men</b>	818	852	901	892	891	972	980	992	1059	1042
<b>% Men</b>	80.2%	79.7%	78.3%	78.7%	78.4%	76.7%	76.3%	75.9%	75.6%	75.7%
<b>Total</b>	1020	1069	1150	1134	1136	1268	1285	1307	1400	1376

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>No.</b>	334	368	359	355	349	359	379	387	403
<b>% Women</b>	24.3%	26.6%	26.6%	27.0%	26.8%	27.2%	28.1%	28.4%	28.7%
<b>No. Men</b>	1042	1018	991	962	952	961	971	978	1000
<b>% Men</b>	75.7%	73.4%	73.4%	73.0%	73.2%	72.8%	71.9%	71.6%	71.3%
<b>Total</b>	1376	1386	1350	1317	1301	1320	1350	1365	1403

<sup>18</sup> The term Professors (or Faculty) designates both Full Professors and Assistant Professors, Tenured Researchers and Untenured Researchers, either untenured assistant professors or tenure-track assistant professors.

<sup>19</sup> The data is relative to 2017.

The mean age of Professors at Politecnico di Milano is 49.1 years, with women slightly younger on average (48.6 years) than men (49.3 years). This evidence is also underpinned by Figures 3.1 and 3.2, which describe the distribution of male and female professors by age group, stating their number and percentage. As we can see, at Politecnico di Milano, 59.0% of female professors are younger than 50 years vs. 54.4% of male professors, while 9.7% of women are aged over 60 years, and 17.8% of men.

Figure 3.1: Number of Professors by Age Group

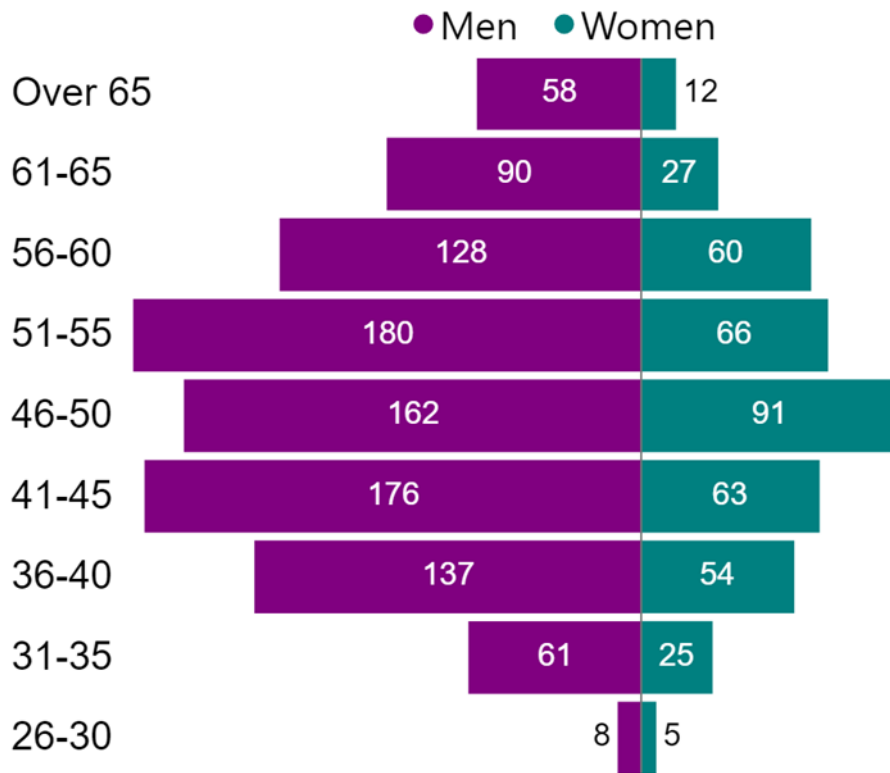
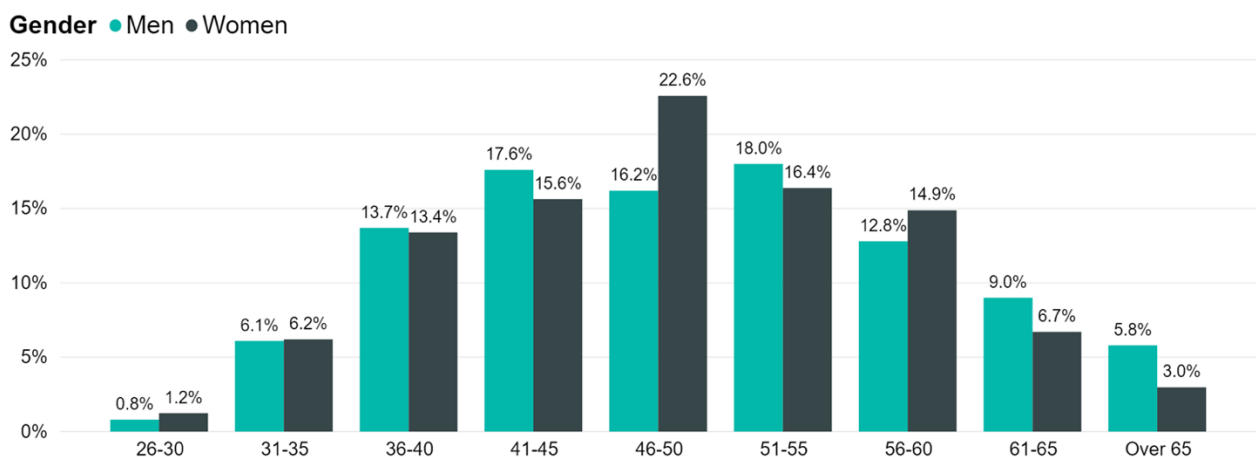


Figure 3.2: Percentage of Professors by Age Group



Regarding the academic position, Politecnico di Milano counts 388 full professors (27.66% of the total), 597 assistant professors (42.55% of the total) and 418 professors holding the position of researcher (29.79% of the total). The latter group comprises tenured positions (42.82%, 179), fixed term positions (25.64%, 103) and permanent positions (32.54%, 136).

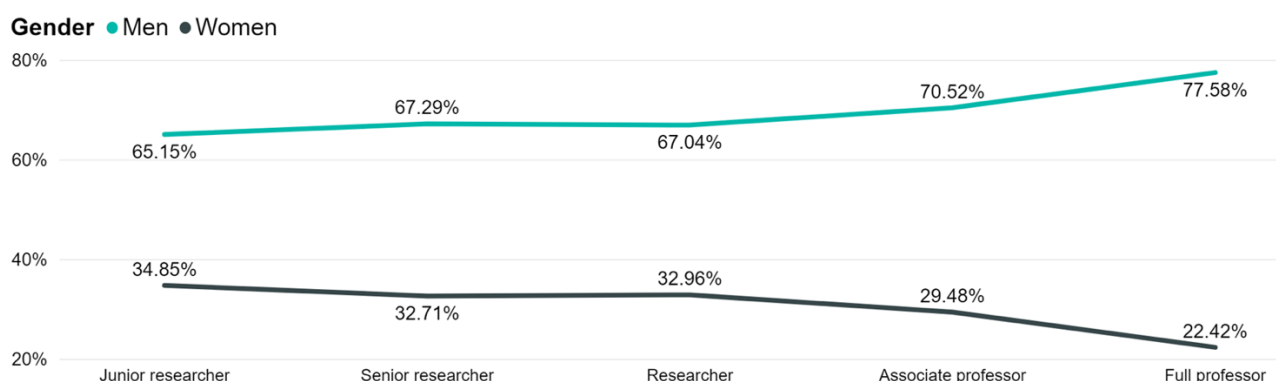
Table 3.2: Distribution of Professors by Position

Position	Men		Women		Total	
	n°	%	n°	%	n°	%
<b>RTDa [untenured researcher with permanent contract]</b>	89	8.90	47	11.66	136	9.69
<b>RTDb [untenured researcher with fixed term contract]</b>	69	6.90	34	8.44	103	7.34
<b>Tenured Researcher</b>	120	12.00	59	14.64	179	12.76
<b>Associate Professors</b>	421	42.10	176	43.67	597	42.55
<b>Full Professors</b>	301	30.10	87	21.59	388	27.66
<b>Total</b>	1,000	100.00	403	100.00	1,403	100.00

The percentage of men and women is similar in the various positions for Associate Professors (42.1% of men, compared to the total of the male population, and 43.7% of women, compared to the total of the female population). There are more men in the group of full professors (30.1% of men, compared to the total male population, and 21.6% of women, compared to the total female population), more women holding the position of researcher (particularly 14.6% of women, compared to the total female population, are tenured researchers vs. 12% of men, 11.7% are untenured assistant professors vs. 8.9% of men, 8.4% are tenure-track assistant professors vs. 6.9% of men).

The graph below reports the percentage of men and women in the various career positions. Figure 3.3 reveals the well known vertical segregation<sup>20</sup> and *leaky pipeline phenomena* that characterise the academic careers. As occurs nationally and internationally, with different degrees of intensity in the various scientific disciplinary sectors, the percentage of women diminishes as career levels rise. Two aspects of the graph are worthy of note. Firstly, the percentage of women diminishes by almost two points already comparing the positions of untenured assistant professor and of tenure-track assistant professor. Considering that, though both are fixed term positions, the role of untenured assistant professor does not envisage any form of stabilisation, while the position of tenure-track assistant professor, in accordance with the law<sup>21</sup> and with certain requisites, can evolve into the role of associate professor, data indicated the more precarious academic career of women. Secondly, it must be observed that the presence of women diminishes by almost 7 percentage points in the transition from associate professor to full professor. Data is consistent with that of the MIUR report of the Italian situation, according to which the percentage of female full professors is 23% of the total number of full professors.

Figure 3.3: Scissor graph of Professors by Position

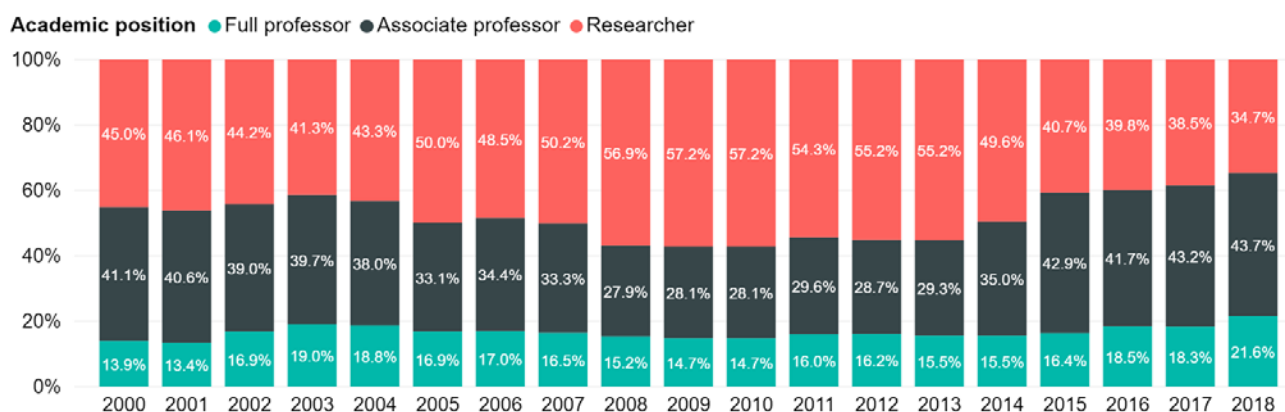


<sup>20</sup> The term “vertical segregation” underscores the fact that leading positions are mainly held by men in organisations.

<sup>21</sup> Gelmini Law no. 240/2010.

The graph below, Figure 3.4, reports the evolution in time of the female component of professors by position. It is evident that the percentage of female full professors has increased in time, with slight fluctuations in the various years, reaching 21.6% of the total number of female professors at the Politecnico in 2018. This percentage is consistent with the information contained in the MIUR's document, which reports 23% as national mean in all sectors for the percentage of female full professors, and shifts to 19%, if only STEM subjects are considered. Regarding Idea League's partner universities, the percentage of women among *full professors* at RWTH Aachen is 23.14%, while it is 13.14% at ETH, Zurich, and rises to 21.9%, if all "Professor" positions are considered, and for Zurich, "Full" and "Associate" Professor.

Figure 3.4: Distribution of Female Professors by Academic Position



Regarding career transitions (Tables 3.3 and 3.4), the historical 2001-2018 series shows that the evolution of career pathways was strongly influenced in time by the *turn-over block*, which is particularly limited during the period 2008-2013. In the five-year period 2014-2018, 29.92% of career transitions to the position of associate professor concerned women. In fact, there were 391 promotions to associate professor, out of which 117 concerned women and 274 regarded men. A lower percentage can be observed in the case of transitions to the position of full professor. Particularly, from 2014 to 2018, the Politecnico recorded 239 transitions from associate professor to full professor, with 41 (17.15%) women and 198 (82.84%) men becoming full professors.<sup>22</sup> Data must naturally be interpreted considering the lower presence of women among professors and in the position of associate professor (29.84%); however, it provides a rough idea of the greater difficulty experienced by women in reaching the highest level of the academic career, also considering the lower percentage of women potentially hoping for the position.

Finally, regarding the recruitment of untenured researchers, there are currently 136 untenured assistant professors and 103 tenure-track assistant professors (table 3.2) in service, but the rather small numbers of new recruits and the high turnover, typical of this position, prevent the definition of a precise and reliable picture of the dynamics in progress.

<sup>22</sup> Art.16 of Gelmini Law no. 240/2010 states the mandatory requirement to possess the Italian scientific qualification to participate in the selection process for associate professor and full professor: the first public competition that applied this regulatory indication was held at the university in 2012.

*Table 3.3: Number and Percentage of Career Transitions from Researcher to Associate Professor out of the Total Number of Professors*

Year	Men		Women		Total
	no.	%	no.	%	no.
2001	28	13.08	8	8.79	36
2002	47	20.09	15	15.00	62
2003	21	8.43	8	7.27	29
2004	12	5.26	1	1.00	13
2005	30	13.22	9	8.49	39
2006	15	5.17	9	6.08	24
2007	10	3.36	5	3.38	15
2008	3	0.97	1	0.63	4
2009	0	0.00	1	0.52	1
2010	18	4.37	10	5.24	0
2011	33	8.01	18	9.42	79
2012	0	0.00	0	0.00	0
2013	1	0.23	3	1.52	4
2014	76	17.84	25	12.76	101
2015	109	30.19	36	20.81	145
2016	16	5.71	15	10.27	31
2017	16	5.33	17	11.26	33
2018	57	18.81	24	16.11	81

*Table 3.4: Number and Percentage of Career Transitions from Associate Professor to Full Professor out of the Total Number of Professors*

Year	Men		Women		Total
	no.	%	no.	%	no.
2001	28	9.46	3	3.61	31
2002	42	14.63	12	13.64	54
2003	10	3.48	5	5.15	15
2004	8	2.68	2	2.08	10
2005	34	11.26	6	6.45	40
2006	21	7.19	3	3.06	24
2007	7	2.52	1	0.95	8
2008	4	1.44	4	3.81	8
2009	0	0.00	0	0.00	0
2010	9	3.54	4	4.26	0
2011	16	6.30	7	7.45	36
2012	0	0.00	1	0.92	1
2013	1	0.39	2	1.94	3
2014	9	3.59	3	2.88	12
2015	13	4.15	5	4.10	18
2016	32	7.82	13	8.44	45
2017	13	3.32	6	3.80	19
2018	35	8.84	17	10.18	52



Shifting attention to seniority in the position and considering subjects who obtained a career transition from associate professor to full professor starting from the year 2000, with an active career in 2018 (309 professors out of the total number of 1,403 professors currently in service, 22.02%), it can be noticed that women have 6.44 years of seniority in the position of full professor vs. 8.95 of their male colleagues. 44 female full professors out of 87 (50.57%) and 103 male full professors out of 301 (34.22%) have held the position of full professor for less than 5 years. The difference of almost 15 percentage points must be interpreted considering the anagraphic age of subjects who obtained a career transition to full professorship starting from 2000. Women in this group have a mean age of 51.86 years, while the mean age of men is 51.58 years; hence, the numbers are comparable. Briefly, this evidence indicates the fact that women access the highest position of the career at a later age.

The subsequent analyses combine the information on the anagraphic age of professors with information on the position: the differences between men and women are minimum. As reported in the table below (Table 3.5), the mean anagraphic age of male full professors is 56.63 years, while that of female full professors is 55.52 years. Women are slightly older, if we consider the position of associate professor (49.85 vs. 48.98). The same is true for the category of researchers (36.48 vs. 35.98 for untenured assistant professors, 40.14 vs. 38.19 for tenure-track assistant professors, 49.59 vs. 35.98 for tenured researchers).

*Table 3.5: Mean Age of Professors by Gender and Position*

<b>Position</b>	<b>Men</b>	<b>Women</b>
<b>RTDa [untenured researcher with permanent contract]</b>	35.98	36.48
<b>RTDb [untenured researcher with fixed term contract]</b>	38.19	40.14
<b>Tenured Researcher</b>	48.88	49.59
<b>Associate Professors</b>	48.99	49.86
<b>Full Professors</b>	56.63	55.52
<b>Total</b>	49.38	48.67

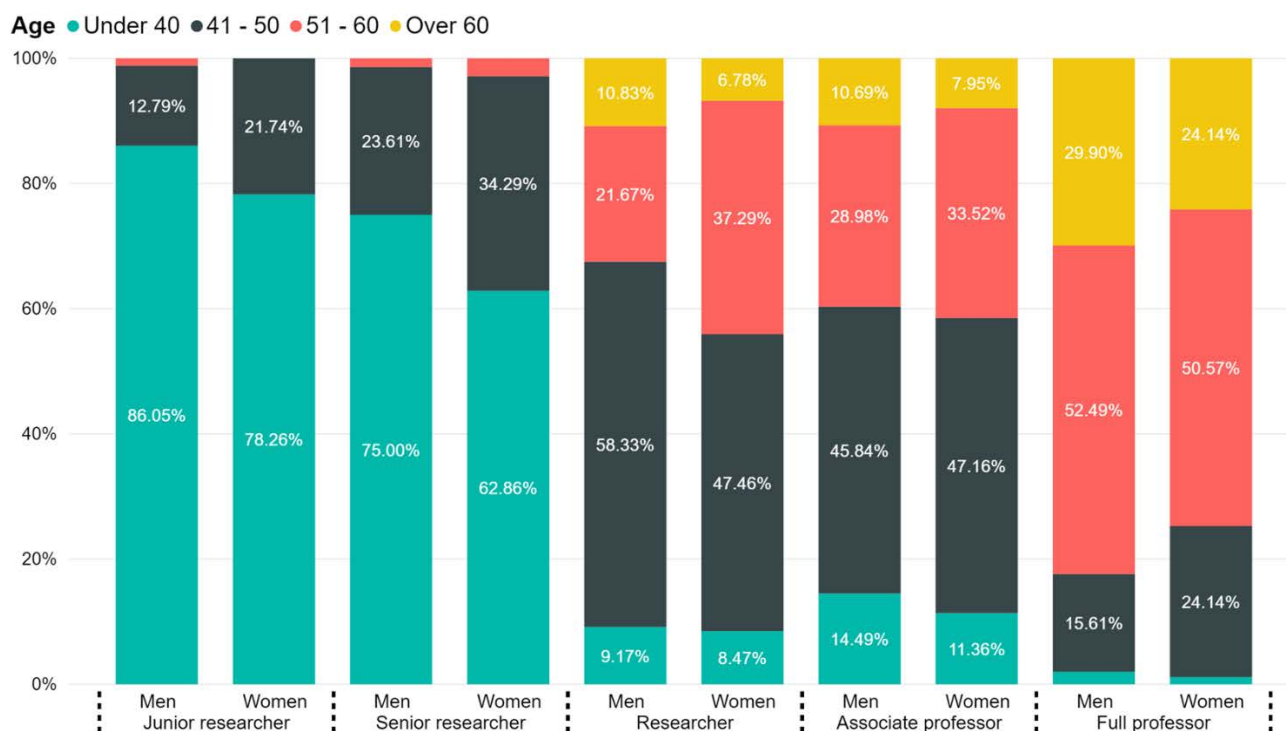
A detailed analysis of graph 3.5, which reports the distribution of professors by age groups in the various positions, reveals that men and women are distributed in a relatively homogeneous manner in terms of percentages occupying the positions.

The greatest differences can be noticed in the position of researcher with a slight prevalence of men in the younger age group (under 41 years) both among untenured assistant professors (86.05% vs. 78.26% women), and among tenure-track assistant professors (75.00% vs. 62.86% women) and tenure-track assistant professors with permanent contract (9.17% vs. 8.47% women).

Shifting to the position of associate professor, the percentage distribution in the age groups presents less evident variations. The distribution of female associate professors presents 11.36% in the age group under 41 years, 47.16% in the age group 41-50 years, 37.29% in the age group 51-60 years and 6.78% aged over 60 years. The distribution of male associate professors is 9.17% in the age group under 41 years, 58.33% in the age group 41-50 years, 21.67% in the age group 51-60 years, and 10.83% aged over 60 years.

25.29% of female full professors are 50 years or younger vs. 17.59% of men in the same age group. The presence in other age groups has less important differences.

Figure 3.5: Professors as of 31/12/2018 by age group and position



### 3.1.2. PERFORMANCE OF PROFESSORS

This section analyses the performance of faculty in terms of scientific publications and projects subjected to a competitive evaluation. Each professor enters all his or her publications in the university's application IRIS. The Politecnico then assigns a score to each publication entered, taking into account the type of publication (e.g., review or conference), site of publication (Italian or international) and other parameters, such as, for instance, number of co-authors, presence of co-authors outside the university and presence of co-authors from foreign universities. The data below refer to scientific publications entered in the database as of 31 December 2017 and relative to the calendar year 2017<sup>23</sup>. Table 3.6 shows that the great majority of professors at Politecnico di Milano has at least one publication with a positive score in 2017. Percentages do not present remarkable dissimilarities among positions, regarding which there is a slightly lower percentage for full professors and a slightly higher one for researchers. This can perhaps be due to differences in incentives to publication between subjects who are starting the academic career and, presumably, are making an effort to attain a national qualification, and subjects who, instead, have already reached the highest levels of their career and, therefore, also have a heavier load of institutional duties to be carried out.

<sup>23</sup> The table does not present publications of untenured assistant professors. In fact, the small timeline of this position and its volatile features do not allow to obtain comparable data.

Table 3.6: Number and % of Professors with at least one Publication with Positive Score vs. the Total number of Professors

Positio	Men			Women			Total		
	no.	%	Total	n°	%	Total	no	%	Total
<b>RTDb [untenured researcher with fixed term contract]</b>	50	96.15	52	20	100.00	20	70	97.22	72
<b>Researchers</b>	145	88.41	164	78	96.30	81	223	91.02	245
<b>Associate Professors</b>	356	89.90	396	147	88.02	167	503	89.34	563
<b>Full Professors</b>	246	88.17	279	59	83.10	71	305	87.14	350
<b>Total</b>	797	89.45	891	304	89.68	339	1101	89.51	1230

Considering the 1,101 professors who have obtained a positive score, Table 3.7 reports the mean score by position. The mean score is higher for full professors. This result indicates the positive effect of experience in the quality of scientific research. In each position, women have a slightly lower score than their colleagues. This is consistent with the literature that reports how women pay, even in terms of scientific productivity, for the need to balance work with the greater family commitment<sup>24</sup>. It is, however, interesting to observe how the difference diminishes as career progresses, shifting from +0.47 for male and female researchers to +0.27 for male and female full professors. This evidence seems interesting, though it must be evaluated with caution. In fact, it might suggest that their greater experience helps female professors to better manage their scientific production and/or that female professors reach the position of full professors when they have passed the phase of the birth and early infancy of their children, which require the woman's more dedicated parental care.

<sup>24</sup> The ISTAT calculates that, on average, adult women spend 5 hours and 13 minutes a day (ISTAT, 2014, "I tempi della vita quotidiana" [The times of daily routine]) caring for home and family (family work).

Table 3.7: Analysis of the Overall Scores obtained by each person with at least one publication having a positive score

<b>RTDa</b>			
<b>[untenured researcher with permanent contract]</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>Min Score</b>	0.10	0.13	0.10
<b>Max Score</b>	15.54	6.80	15.54
<b>Mean Score</b>	2.86	2.55	2.77
<b>Variance</b>	7.31	2.89	5.95

<b>RTDb</b>			
<b>[untenured researcher with fixed term contract]</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>Min Score</b>	0.34	0.10	0.10
<b>Max Score</b>	8.44	6.30	8.44
<b>Mean Score</b>	3.14	2.42	2.94
<b>Variance</b>	3.72	2.29	3.38

<b>Researchers</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>Min Score</b>	0.08	0.08	0.08
<b>Max Score</b>	15.60	8.20	15.60
<b>Mean Score</b>	2.59	2.28	2.48
<b>Variance</b>	5.60	3.22	4.77

<b>Associate Professors</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>Min Score</b>	0.08	0.09	0.08
<b>Max Score</b>	52.93	16.35	52.93
<b>Mean Score</b>	3.27	2.82	3.14
<b>Variance</b>	15.60	6.26	12.90

<b>Full Professors</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>Min Score</b>	0.04	0.04	0.04
<b>Max Score</b>	49.52	22.96	49.52
<b>Mean Score</b>	3.42	3.19	3.38
<b>Variance</b>	18.95	10.36	17.26

Another important indicator of scientific productivity is requesting and obtaining funds for projects subjected to a comparative evaluation. In recent years, the Politecnico has encouraged and supported the participation of its professors in H2020 projects, with specific actions designed to expand structures supporting research.

Table 3.8 reports the number and percentage of professors who have submitted a project proposal within the scope of the European Community's H2020 framework programme.

In the course of 2017, 1,365 professors employed by the Politecnico presented a total number of 320 proposals for project H2020<sup>25</sup>; precisely, 23.44% of those in service that year presented at least one proposal. Of these 320 proposals, 241 (75.31%) were presented by men, and 79 (24.68%) by women.

The percentage of women presenting at least one proposal (20.41%) is approx. 4 percentage points lower than the male percentage (24.64%). If we consider the distribution by position, we notice that the percentage of those presenting at least one proposal increases as the position's level rises. Only 10.62% of professors holding the position of researcher presented a proposal, vs. 35.71% of full professors, thus underscoring the importance of experience in this type of activity. Moreover, the difference in percentages of proposing women and men grows slender in the transition from associate to full professor, dropping by more than 6 percentage points to less than 3. It would be interesting to study how the difference in this type of activity depends on anagraphic age differences and, subsequently, on the family-related burden of women holding the positions of associate and full professor<sup>26</sup>.

Table 3.8: Number and Percentage of Proposals for Project H2020 in 2017 out of the total

Position	Men			Women			Total		
	n°	%	Total	n°	%	Total	n°	%	Total
<b>Researchers</b>	29	9.57	303	19	12.75	149	48	10.62	452
<b>Associate Professors</b>	111	28.03	396	36	21.56	167	147	26.11	563
<b>Full Professors</b>	101	36.20	279	24	33.80	71	125	35.71	350
<b>Total</b>	241	24.64	978	79	20.41	387	320	23.44	1,365

The proposals funded were 46 out of the 320 presented, with a success rate of 14.38%, which is more than two percentage points higher than the national mean (12.20%), and is consistent with the European mean (14.59%)<sup>27</sup>. Success rates are comparable for men and women: 11 out of the 79 proposals presented by women were funded (13.92%); 35 out of a total number of 241 proposals submitted by men were funded (14.52%). The small numbers make it scarcely significant to compare success rates between genders in the various positions. But it is interesting to notice that 4 proposals out of the 19 presented by researchers were successful, compared to only 1 out of 29 for researchers. Data is reversed for male and female full professors: none of the 24 proposals presented by female full professors was successful.

Besides participating in European public competitions, professors at Politecnico di Milano are strongly committed to technological transfer. In the course of 2018, 57 patent applications were presented, counting professors from the Politecnico among the proposing subjects. 21 (36.84%) of these applications counted women in the group of inventors. Data appears encouraging since this percentage is higher than the percentage of female professors at the university.

Female professors are scarcely represented in technological transfer activities based on the creation of enterprise. If we consider the Politecnico's spin-offs, as of 2018, there were 54 established and operating spin-offs at Politecnico di Milano, and only 4 of them had a woman as proposing person. Future editions of this document will collect data on the corporate structure of the *spin-offs* in order to define a more exhaustive picture of female entrepreneurship among professors at Politecnico di Milano.

<sup>25</sup> The possibility of the same professor presenting more than one proposal must naturally be considered.

<sup>26</sup> The next edition of the Gender Budget will better explore, with appropriate tools, these aspects of the university's Faculty to improve the overall picture defined by this document and to design targeted supportive actions, where appropriate.

<sup>27</sup> Data were collected from the last APRE report, which presents information updated as of March 2018, <https://www.apre.it/en>

### 3.2 DEPARTMENT PROFESSORS

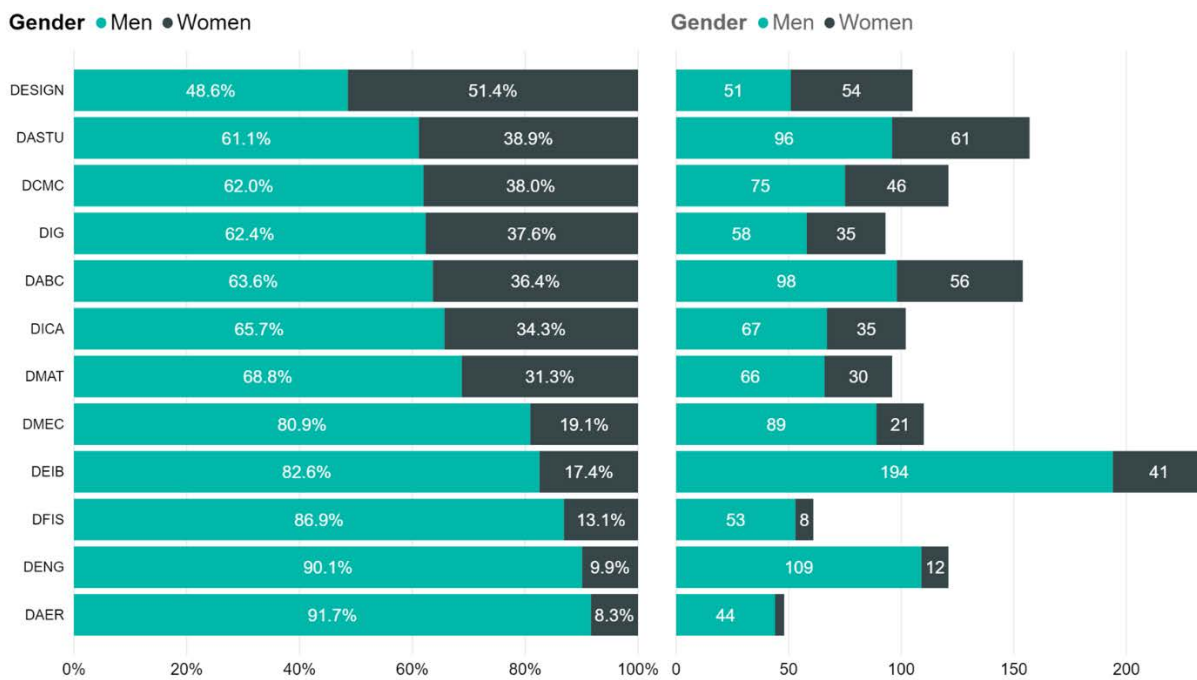
Professors of Politecnico di Milano belong to the twelve departments that form the university, precisely:

- Architecture and Urban Studies (DASTU);
- Architecture, Construction Engineering and Built Environment (DABC);
- "Giulio Natta" Chemistry, Materials and Chemical Engineering (DCMC);
- Design (DESIGN);
- Electronics, Information and Bioengineering (DEIB);
- Energy (DENG);
- Physics (DFIS);
- Civil and Environmental Engineering (DICA);
- Management, Economics and Industrial Engineering (DIG);
- Mathematics (DMAT);
- Mechanics (DMEC);
- Aerospace Sciences and Technologies (DAER).

The largest of the twelve departments is the Department of Electronics, Computer Science and Bioengineering with 235 professors, as of 31 December 2018, while the Department of Aerospace is the smallest, with 48 professors.

Figure 3.6 presents the gender-based distribution of professors in the various departments, showing both percentage values and absolute values, the latter (also) to explain the different dimensions of the departments.

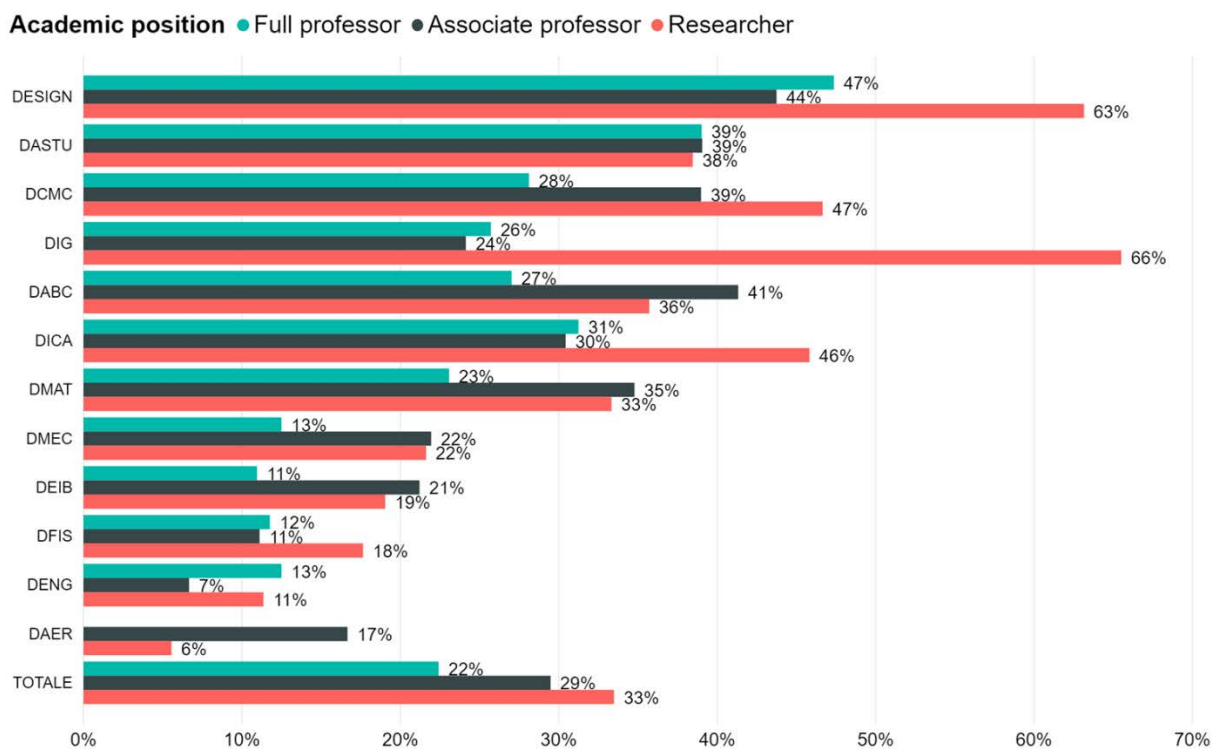
Figure 3.6: Number and Percentage of Professors by Department



The percentage of women among professors is over 30% in seven departments out of twelve, reaching and exceeding men in the Department of DESIGN and verging on 40% in the DASTU Department. Only two departments, DENG and DAER, have a percentage of women that is (barely) under 10%. It is interesting to note that the percentage of women is lower in departments where professors teach and conduct research on themes with greater technological content and which are near *hard science*. This pattern once again suggests that the problem of gender equality is more evident in STEM areas. These percentages are consistent with observations made abroad: TU Delft has a 10.6% percentage of female professors at Mechanical Engineering, 13.20% at Electrical and Information Engineering and, instead, 66.70% at Architecture.

Figure 3.7 too uses the departments as analysis units and shows, with reference to data of 2018, the percentage of women out of the total number of professors, distinguishing the various roles: hence, a value of 50% would indicate perfect gender equality in the various positions. Considering Full Professors, it is evident that five departments out of twelve (DAER, DEIB, DENG, DFIS and DMEC) have a percentage of female full professors below 20%; moreover, these departments are those in which the percentage of women is generally below 20%. In another four departments (DABC, DCMC, DIG and DMAT), the percentage of female full professors is below 30%, being 31.25% at the DICA. Only at the DASTU and DESIGN Department female full professors are present in a percentage that is comparable to that of their male colleagues: 39.02% and 47.37%, respectively. The gender-based distribution is much more equal for male and female researchers. Regarding this position, four departments (DESIGN, DMCM, DICA and DIG) reach or approach equality, and only four (DAER, DEIB, DENG, DFIS) count less than 20% of female researchers out of the total number of professors in this position. Moreover, at DEIB and DFIS the percentages are 19% and 18%, respectively. Given the likely young age and low seniority of professors holding the position of Untenured Assistant Professor and Tenure-Track Assistant Professor, this indicates that there might be a greater gender balance in departments in the course of time.

Figure 3.7: % Women by Department and by Professional Position of Professors



The analysis of gender disparity in departments closes with the calculation of the *Glass Ceiling Index* (GCI), always referring to 2018. This index relates the percentage of women in a facility (in our case the twelve departments into which the university is divided) in all positions, with the percentage of women holding the highest position, who work in the same facility, namely Full Professors. Hence, this index is evaluated as specified below:

$$\text{GCI} = \frac{\frac{\text{Female Professors}}{\text{Total Female Professors}}}{\frac{\text{Female Full Professors}}{\text{Total Female Full Professors}}}$$

An index value in excess of 1 indicates that the percentage of female full professors is less than the percentage obtained by taking all job positions into account, thereby suggesting the presence of a *glass ceiling effect*, precisely of the difficulty women face in reaching the highest level of the academic career.

The value of the GCI must be interpreted considering the incidence of the female presence in each department, as reported in Table 3.9<sup>28</sup>. Note that the GCI for the Department of Aerospace Sciences and Technologies (DAER) could not be calculated as there are no female full professors.

The overall value of the university's GCI in 2018, equal to 1.28, is better than the European mean calculated by the study *She Figures* for 2018, which is equal to 1.75<sup>29</sup> (the one expected for EU28 for 2016 is 1.64, which presents a slight improvement). Data reliability must be evaluated with caution, since the CGI must be interpreted based on the number of women at the university. The MIUR reports, for the overall Italian situation, a CGI of 1.63 in 2017, and Politecnico di Milano seems consistent with this. Specifically, the three departments with the highest (hence, the worst) CGI score are DEIB, DMEC and DIG. While a high GCI value is accompanied by a percentage of women not exceeding 20% (17.45% and 19.09%, respectively) in the first two departments, at the DIG the percentage of women is 37.63%, but women are only 25.71% of full professors. A similar situation can be observed in the three departments with lowest CGI values. DESIGN reaches and surpasses equality for the percentage of women, and women are 47.37% of full professors. DASTU's percentage of women is 38.85% and the percentage of full professors is 39.02%, thus indicating the absence of the Glass Ceiling Effect. The absence of the Glass Ceiling Effect can also be observed in the Department of Energy, where the percentage of women is very low. In this department, considering the percentage of 9.92% of female professors, 12.5% of full professors are women.

<sup>28</sup> Note that the GCI cannot be calculated for DAER where there are no female full professors.

<sup>29</sup> European Union – Directorate-General for Research and Innovation (2016), *She Figures 2015*, Brussels, p. 136.



Table 3.9 Glass Ceiling Index of Professors by Department

Women Department	Percentage of Women out of Total (%)	Percentage of Female Full Professors (%)	GCI Women
<b>DABC</b>	36.36	27.03	1.35
<b>DAER</b>	8.33	0	nc*
<b>DASTU</b>	38.85	39.02	1.00
<b>DCMC</b>	38.02	28.13	1.35
<b>DEIB</b>	17.45	10.96	1.59
<b>DENG</b>	9.92	12.5	0.79
<b>DESIGN</b>	51.43	47.37	1.09
<b>DFIS</b>	13.11	11.76	1.11
<b>DICA</b>	34.31	31.25	1.10
<b>DIG</b>	37.63	25.71	1.46
<b>DMAT</b>	31.25	23.08	1.35
<b>DMEC</b>	19.09	12.5	1.53
<b>TOTAL</b>	28.72	22.42	1.28

### 3.3 PROFESSORS IN THE UNIVERSITY GOVERNING BODIES

The fact that the percentage of female professors is below 30% and that female full professors are only 22.42% of professors holding that position<sup>30</sup> is mirrored in the gender-related composition of University Governing Bodies, shown in Table 3.10. On 31 December 2018, Politecnico di Milano has a male Rector, while the position of Executive Vice Rector is held by a woman. The five campuses (Como, Cremona, Mantua, Lecco and Piacenza) count four male Vice Rectors and one female Vice Rector, in the Como campus. Twelve of the eleven Department Directors are men. The only woman directs the Department of Design where the female population is highest, as mentioned above and in the chapter on the student population. The number of women slightly increases, if we consider the position of Deputy Head: there are three women, vs. twelve men.

The gender-based composition of the above-mentioned university governing bodies influences the gender-related composition of the Academic Senate. Indeed, it is made up of twenty-five members who, besides the elected students' representatives, professors and technical-administrative staff, include the Rector and Vice Rectors, Director General and his Deputy, and the twelve Department Directors. There are twenty (80%) male senators, and five (20%) women. Of the latter, besides the Director of the Department of Design, two were elected as representatives of technical-administrative staff, one was elected as students' representative, and one as Faculty representative.

The number of women rises, if the position of study programme coordinators is considered. The PhD School has a male coordinator, while the nineteen Research Doctorate programmes of Politecnico di Milano are guided by four (21.0%) female coordinators and fifteen (78.9%) male coordinators. The percentage of women at the head of the forty-two study programmes (26.19%) is similar to that of women in the Faculty. Indeed, there are eleven female coordinators vs. thirty-one (73.8%) male coordinators.

<sup>30</sup> Some governing positions, such as, for instance, the position of male or female Department Director, can only be held by full professors.

As expected, the gender-related composition changes in the case of the Guarantee Committee<sup>31</sup>, which counts seven women and four men.

Table 3.10 Composition of University Governing Bodies as of 31.12.2018

	Men		Women		Total
	no.	%	no.	%	no
<b>Rector</b>	1	100	0	0	1
<b>Executive Vice Rector</b>	0	0	1	100	1
<b>Vice Rector</b>	1	100	0	0	1
<b>Rector's Delegates</b>	24	67	12	33	36
<b>Campus Vice Rectors</b>	4	80	1	20	5
<b>Academic Senate</b>	20	80	5	20	25
<b>Board of Governors</b>	9	75	3	25	12
<b>Deans of Schools</b>	3	75	1	25	4
<b>Department Directors</b>	11	92	1	8	12
<b>Vice Department Directors</b>	9	75	3	25	12
<b>Study Programme Board Coordinators</b>	31	74	11	26	42
<b>Doctoral Programme Coordinators</b>	14	74	5	26	19
<b>Guarantee Committee*</b>	4	36	7	64	11

This chapter analysed members of the university's Faculty, underscoring their gender-based distribution in the various positions. The main points are summarised below:

- the percentage of women in the Faculty has steadily risen in the course of time from 19.8% in 2000 to 27.8% in 2018, recording an approx. 10 percentage point growth that is promising for the future; despite the difficulties experienced by technical schools in this regard, and, generally, by STEM areas, the Politecnico has undertaken a pathway that, however slowly, is constantly moving towards greater gender equality;
- the fact that the percentage of women is over 30% in the entrance positions to the academic career contributes towards the above-mentioned positive trend: the positions of Untenured Assistant Professor and Tenure-Track Assistant Professor; in three departments, female researchers exceed 40% of the total number; given the young age typical of subjects occupying these positions, we expect greater equality in the future because more women will be entering the system as members of a prevalently male Faculty retire;
- consistently with the situation in Italy and in the international scene, women are still less represented than their male colleagues in the positions of Associate Professor: female full professors are 22.42% of the total number of full professors; this percentage is below 15% in five departments out of twelve, while only in two departments the percentage of full professors is comparable to that of full professors; these are the departments of DESIGN and of Architecture and Urban Studies in which the percentage of women is particularly high both among professors and in the student population; this confirms a consideration made in the literature: it is easier for women to advance in their career in areas where their numbers are high;
- always regarding the previous point, it is comforting to notice that the university's Glass Ceiling Index is 1.28, which is less than the European value indicated for 2013 by the study She Figures (1.75);

<sup>31</sup> The CUG is a joint body made up of three representatives elected by professors and technical-administrative staff, three representatives elected by students and PhD students, three full members (and three alternative members) from trade union organisations.

- even productivity data are encouraging. Regarding scientific publications, the productivity of professors is only little lower than that of their male colleagues. Despite their higher burden of family-related duties, female professors at the Politecnico keep up with the pace, especially female full professors who have most likely reached an age when the burden of family duties is diminishing. The H2020 programme's success rate in European projects is also comparable with the above, while women are reasonably active in clerical work.



## 4. ANALYSIS OF TECHNICAL-ADMINISTRATIVE STAFF

This chapter analyses technical-administrative staff (PTA) at Politecnico di Milano with regard to certain key criteria and characteristics, and presents any gender-related differences. Particularly, after an overall view, it analyses the PTA's layout in the organisational structures where its professional duties are performed: university Administration, Departments, Laboratories and Campuses. Finally, it studies absences and access to flexible work opportunities, always in terms of gender diversity.

### 4.1 AN OVERALL VIEW

As of 31 December 2018, the technical-administrative staff (PTA) at Politecnico di Milano was made up of 1,233 persons working in the seven campuses distributed in the cities of Milan (Leonardo and Bovisa campus), Como, Lecco, Cremona, Mantua and Piacenza. 732 (59.37%) of them are women and 501 (40.63%) are men. Women are predominant among PTA staff, unlike the university's student population and professors. The mean age of PTA staff is 47.57 years; women are, on average, 47.48 years, and men are 47.71 years. Hence, the difference in age between the two genders is very small. Moreover, the mean age of PTA staff is in line with that of professors.

Figures 4.1 and 4.2 report PTA staff composition by age groups and gender, respectively. Data presented in the tables and figures do not include managers who are discussed in the next chapter. We can notice how women are concentrated in the central age groups, from 41 to 55 years, while they are less present in the younger and older age groups. In fact, only 3.1% of women is 30 years or younger, and only 6.7% is over 60 years. The distribution of male PTA staff by age groups is, instead, more uniform, with a higher presence than women in the extreme age groups. Men aged 30 or less are 4.2% of the total, those aged over 60 years are 10.3% of the total. The difference between men and women in this age group is probably due to the differences in retirement age which, despite changes in the course of years, was always lower for women than for men.

Figure 4.1: Technical-Administrative Staff (PTA) Distribution by Age Group (absolute values)

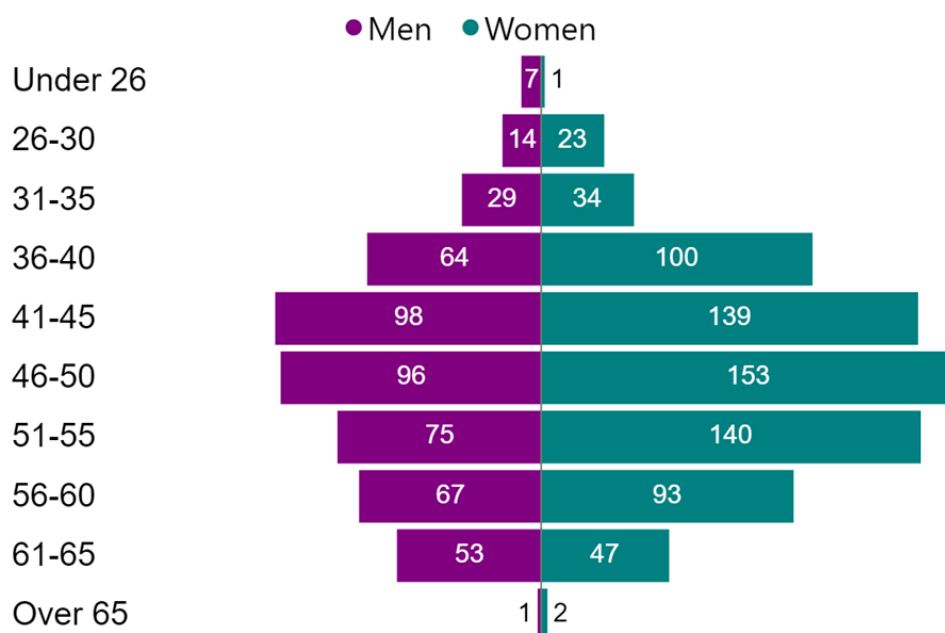
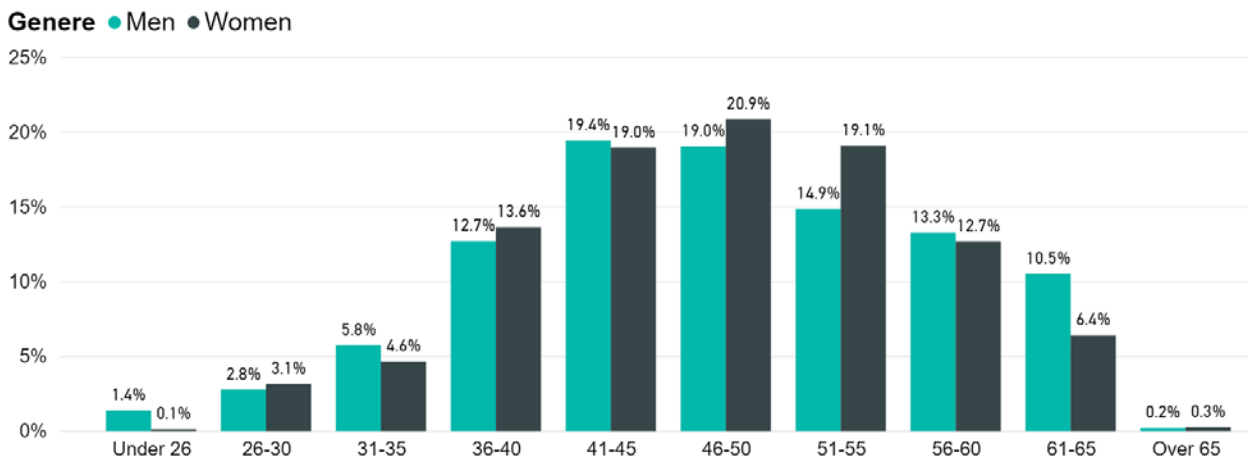


Figure 4.2: Technical-Administrative Staff (PTA) Distribution by Age Group (% out of the total by gender)



Technical -Administrative Staff belong to various categories with a specific degree of autonomy and responsibility, described in Table 4.1, as established by the National Collective Labour Agreement<sup>32</sup>.

Table 4.1: Technical-Administrative Staff (PTA) Categories and their Operative Description

CATEGORY	Degree of autonomy	Degree of responsibility	Qualification required for external access
B	Performance of duties based on established procedures	Relative to fair implementation of procedures	Compulsory education and professional qualification, if any
C	Performance of activities related to procedures, with various levels of complexity, based on criteria partly established in	Relative to the overall fairness of the procedures managed	Diploma of upper secondary school
D	Performance of functions implying various solutions not established in	Relative to technical and/or managerial fairness of the solutions	Laurea (equivalent to bachelor of science)
EP	Relative to the solution of complex organisational and/or professional problems	Relative to the quality and cost-effectiveness of the results obtained	Laurea (equivalent to bachelor of science) and professional qualification, or laurea and particular

Figure 4.3 indicates that category B includes less than 5% of PTA staff members, categories C and D are, instead, larger, including respectively, approx. 47% and 40% of members. Finally, approx. 9% of PTA staff belong to the higher category, which is EP.

A cross comparison of gender-related data and of contractual data (Figure 4.4 and Figure 4.5) reveals the interesting fact that there are more women in lower contractual categories.

<sup>32</sup> National Collective Labour Contract 9.8.2000.

In fact, category B includes 5.21% of women vs. 3.43% of men, just as category C includes 50.41% of women vs. 41.21% of men, an almost 10 percentage point difference. The percentages are reversed for the higher categories. There are 42.22% of men in category D vs. 38.22% of women. The higher category is reached by little less than 6% of women vs. about 2-fold that percentage (13.13%) among men. This proves that the *leaky pipeline* phenomenon also concerns PTA staff, as expected.

Figure 4.3: Technical-Administrative Staff (PTA) Distribution by Contractual Category

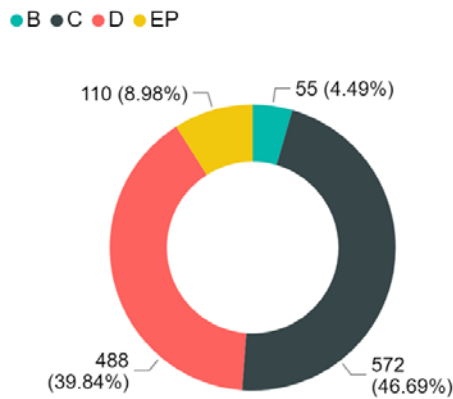


Figure 4.4: Technical-Administrative Staff (PTA) Distribution of Women by Contractual Category

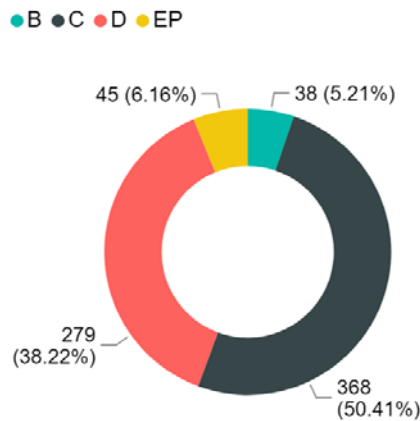
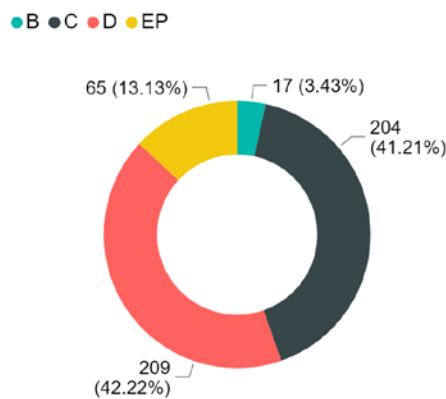
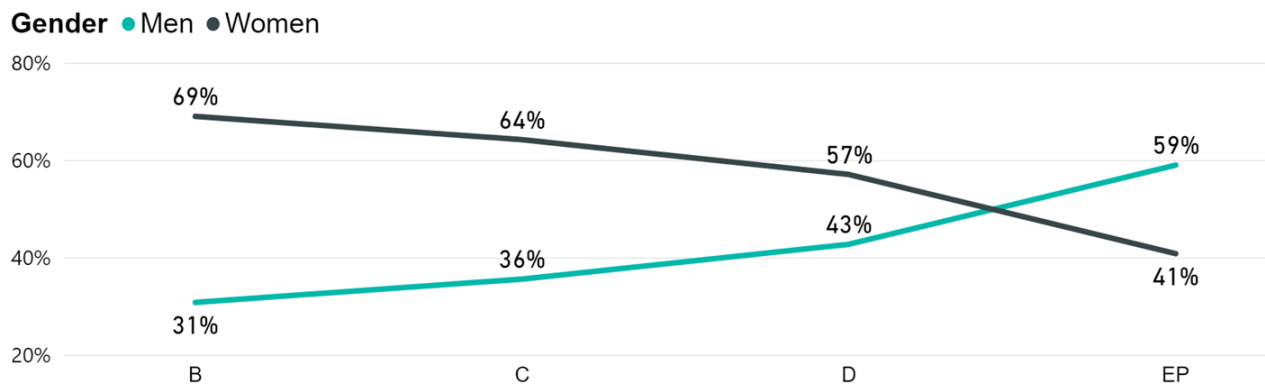


Figure 4.5: Technical-Administrative Staff (PTA) Distribution of Men by Contractual Category



Instead, Figure 4.6 reports the percentage of women out of the total number in the individual contractual categories. The graph presents the typical shape of the “scissor diagram”, which is widely used to analyse female careers vs. male ones, and was already observed when analysing the careers of professors. In fact, as the contractual category progresses, the female population – which presents a higher percentage than the male one in the lowest position of the career (category B) – diminishes up to the point when the scissor opens for category EP, the leading category for PTA staff. In fact, this category comprises 59.09% of men and 40.91% of women.

Figure 4.6: Scissor Diagram of Technical-Administrative Staff (PTA)



A cross comparison of data concerning anagraphic age with those of contractual details reveals a substantial homogeneity between the two genders, with the exception of PTA staff in category B, whose female members have a higher mean age than males, as indicated by data reported in Table 4.2.



Table 4.2: Mean Age of Technical-Administrative Staff (PTA) by Contractual Category

<b>B</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>No. of</b>	17	38	55
<b>Min. age</b>	36	35	35
<b>Max. Age</b>	62	64	64
<b>Average age</b>	50.82	55.65	54.16
<b>Variance</b>	64.52	42.44	53.28

<b>C</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>No. of</b>	205	368	573
<b>Min. age</b>	21	25	21
<b>Max. Age</b>	65	66	66
<b>Average age</b>	46.27	46.12	46.17
<b>Variance</b>	110.76	71.48	85.37

<b>D</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>No. of</b>	208	279	487
<b>Min. age</b>	26	26	26
<b>Max. Age</b>	66	66	66
<b>Average age</b>	48.11	47.60	47.82
<b>Variance</b>	77.58	68.29	72.16

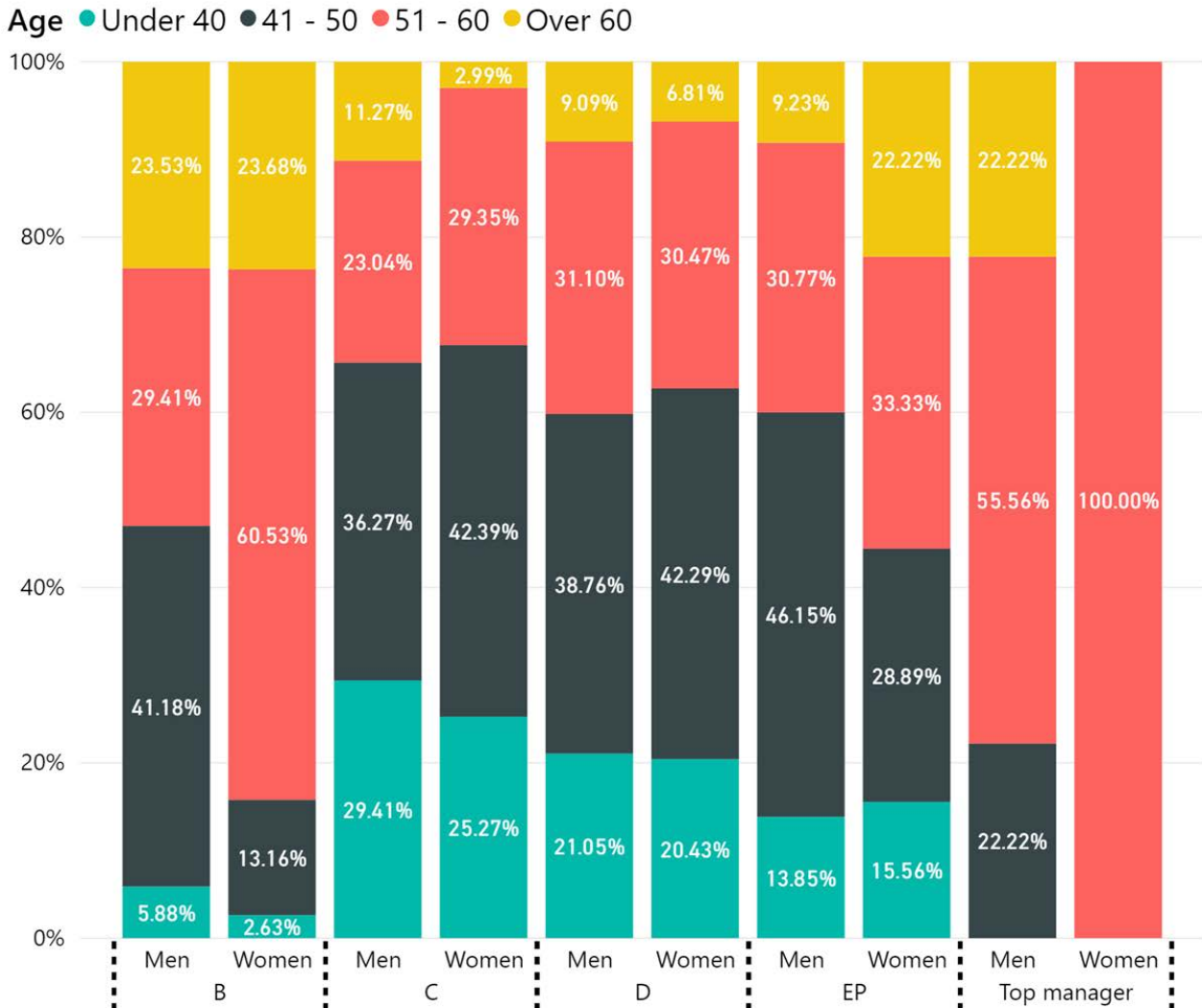
<b>EP</b>			
	<b>Men</b>	<b>Women</b>	<b>Total</b>
<b>No. of</b>	65	45	110
<b>Min. age</b>	28	32	28
<b>Max. Age</b>	64	64	64
<b>Average age</b>	49.03	50.84	49.78
<b>Variance</b>	70.99	80.66	75.11

The analysis will now consider, within each age group, the PTA distribution of male and female staff members by contractual category (Figure 4.7).

In most age groups, the percentage of female PTA staff in the EP category is less than the corresponding male percentage. This under-representation of women seems to suggest that they access higher levels of the contractual career later than their male colleagues, thus underscoring the greater difficulty experienced by women in achieving vertical career progression. The information must, anyhow, be interpreted by also taking into account the fact that, during the past decade, given the regulatory and contractual bonds related to resources available for PTA staff, the trend of Politecnico di Milano's General Management was to prioritise the addition of new staff. This, subsequently, entailed a reduction in resources allocated in favour of vertical progression.

The distribution has a tendency to vary and return to balance – in terms of gender - if we, Instead, consider recruitment for middle management positions (Heads of Service, Staff Function Managers and Managers) into the organisational structure, as better described in the sections below.

Figure 4.7: Technical-Administrative Staff (PTA) by Age Group and by Contractual Category



#### 4.2 TECHNICAL-ADMINISTRATIVE STAFF (PTA) IN THE GENERAL MANAGEMENT AND IN UNIVERSITY ADMINISTRATION AREAS

PTA staff are headed by the Director General who, besides being the guarantor of legality, impartiality, transparency and good progress of the university’s administrative activity, channels, manages, directs, coordinates and controls technical-administrative staff. There is also a Deputy Director General chosen from the Managers. Currently, both the position of Director General and of Deputy Director General are held by men.

The General Management staff perform the following services:

- General Affairs and Institutional Regulation
- Legal Affairs Department
- Collective Bodies

- Partnerships and Framework Agreements
- Planning and Control
- Prevention and Protection
- Sustainability
- Studies
- Director General's Secretariat
- Rector's Secretariat

The University Administration, which guarantees quality services that are necessary for the university's development with a managerial approach, is divided into ten Administrative Areas assigned to Managers, specifically:

- Administration and Finance (AAF)
- Communication and External Relations (ACRE)
- Infrastructures and Services Management (AGIS)
- Human Resources and Organisation (ARUO)
- Students and PhD Students Services (ASED)
- Archiving and Library System (ASAB)
- ICT Services (ASICT)
- Research and Teaching Innovation Supporting Services (ARICID)
- Development and Relations with Companies (ASVI)
- Technical and Construction Matters (ATE)

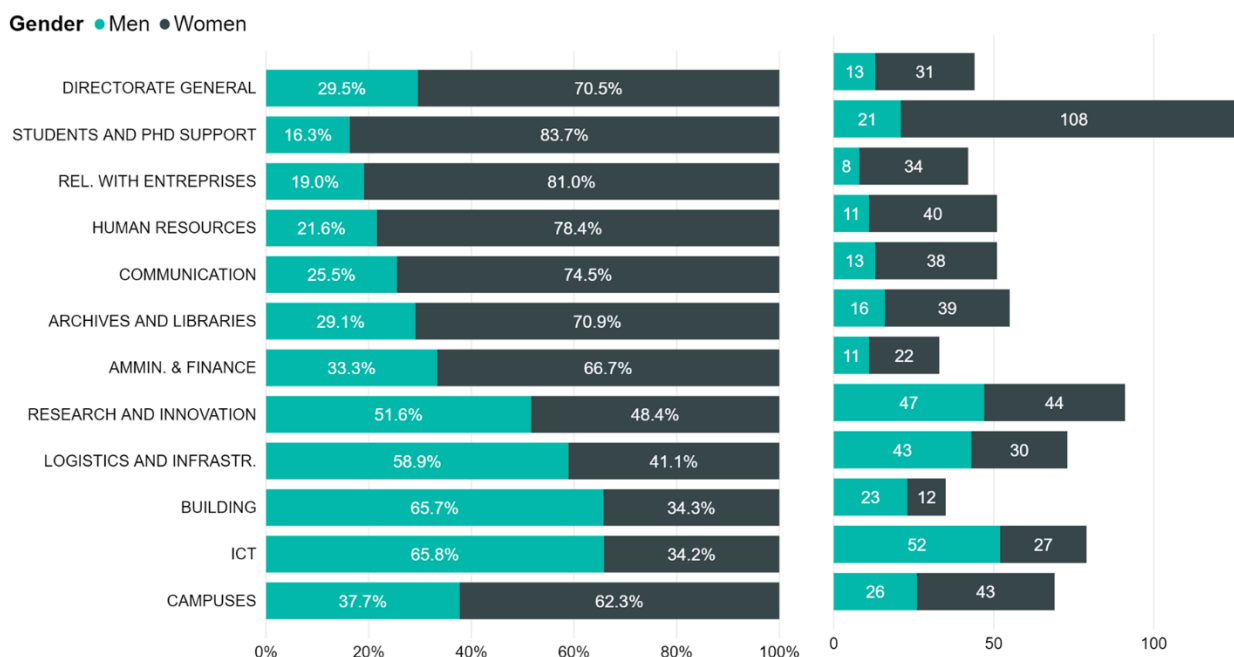
The individual Administration Areas are organised into services and staff functions, respectively guided by *heads of service* and by *staff function managers*. Both positions (Head of Service and Staff Function Manager) have managerial responsibilities over the governed structures, and report to the managers. There are six managers (four men and two women) currently in service at Politecnico di Milano - heading the ten areas; two managers (one man and one woman) and the Director General have duties entailing responsibility over more than one area, to compensate for the absence of three managers who are at present on leave of absence, pending appointments as director general of other universities. Three areas are headed by women: Communication and External Relations, Archiving and Library System (ad interim), and Students and PhD Students Services.

The distribution has a tendency to vary – from a gender-related perspective - considering the overall heads of service and staff function managers present in the university's administration: out of the 62 PTA staff members holding this position, 27 (43.5%) are men and 35 are women (56.4%).

From Figure 4.8, which considers the gender-based distribution of PTA staff in the various areas of the administration, we can notice that in eight structures out of eleven (ten areas plus the general management with its staff services) the percentage of women out of the total number of PTA staff present exceeds 60%, which is the university's mean. In five structures (Students and PhD Students Services Area, Development and Corporate Relations Area, Human Resources and Organisation Area, Communication and External Relations Area, Archiving and Library System Area, General Management), the female PTA staff exceed 70% of the structure's staff, reaching 83.7% in the Students and PhD Students Services Area. Conversely, it can be noticed that in the three areas (Infrastructural and Services Area, Technical-Construction Area, ICT Services Area) the male presence exceeds the female one (AGIS 58.9% vs. 41.1%, ATE 65.7% vs. 34.3% and ASICT 65.8% vs. 34.2%).

In the Research and Teaching Innovation Supporting Services Area the distribution between the two genders is balanced, each constituting approx. 50% of the total. This mirrors the typical situation also in the corporate context, where there is very often a horizontal segregation by function. In fact, as revealed by the above analyses, in the university, as commonly occurs in companies, areas responsible for external relations, staff management and communication have a female predominance, while technical ones have a male prevalence.

Figure 4.8: Percentage and Number of PTA Staff by Gender and Area



#### 4.3 TECHNICAL-ADMINISTRATIVE STAFF (PTA) IN CAMPUSES

Campuses (Como, Cremona, Lecco, Mantua, Piacenza) are the university's governing structure in non-metropolitan branches to which, in compliance with the university's scientific and teaching development programme, a long-term project is associated, implemented with multi-year development plans designed to integrate teaching, research and technological transfer activities, consistently also with the specific features, needs and opportunities of the local area. The responsibility of campuses is assigned to campus managers. They too hierarchically depend on the general management and assist the vice rector of the campus in defining and implementing development projects and in managing the campus.

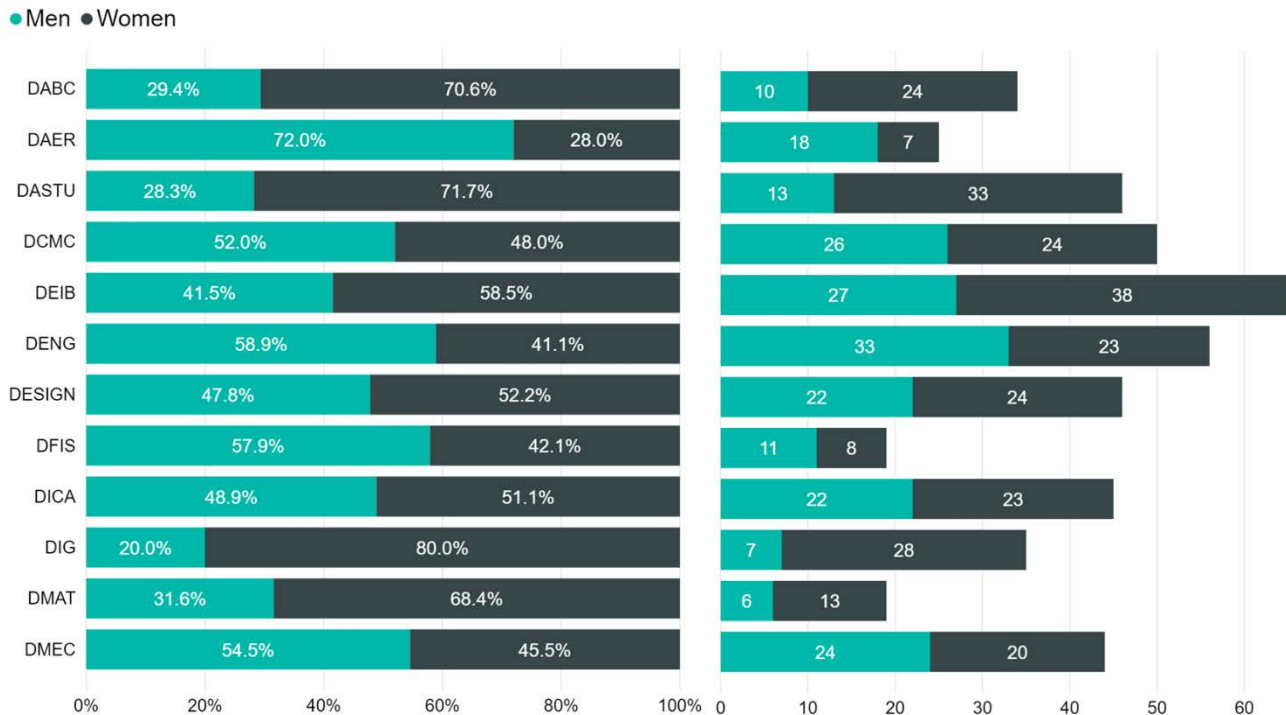
As reported in Figure 4.8, the majority of Technical-Administrative Staff (PTA) in campuses is female: 62.3% are women and 37.3% are men. The campus managers, namely PTA staff members assigned to manage these structures, are women in four cases out of five.

#### 4.4 TECHNICAL-ADMINISTRATIVE STAFF (PTA) IN DEPARTMENTS AND LABORATORIES

From an administrative perspective, the twelve departments (for the list of university departments, see section 3.2 of this document) are headed by the department managers, who ensure the achievement of goals and the integration of *policies* defined by the general management through management of PTA staff, organisation and optimal use of the resources available. Managers assist the department's management in defining and implementing development projects and in running the department, balancing academic needs and compliance with the university's management policies. The gender-based distribution of managers is rather fair, despite a slight prevalence of women: out of the seventeen RG<sub>33</sub> category staff, ten (58.82%) are women and seven (41.18%) are men.

Observing the gender-based composition of department staff, both in terms of absolute value and of percentage (Figure 4.9), it is evident that the percentage of women out of the total of PTA staff exceeds 50% in seven out of twelve departments. In three departments (DIG, DASTU, DABC), female PTA staff are more than 70% of the structure's staff; in four departments (DESIGN, DICA, DCMC and DMEC) the distribution between the two genders is rather balanced with a range of 45-55%. The male gender is decidedly higher in terms of numbers and percentage at the DAER where women are approx. 28% of the total.

Figure 4.9: Percentage and Number of Technical-Administrative Staff (PTA) by Gender and Departments



There is a total number of 245 laboratories at Politecnico di Milano (208 Departmental Laboratories, 33 Interdepartmental Laboratories, 4 Large Infrastructures that belong to the University Administration)<sup>34</sup>, and most of them (over 160) belong to the Engineering sector (mechanics, physics, energy, aerospace, chemistry, electronics).

Laboratory staff perform quantitative and qualitative analyses, tests and measurements supporting research groups that are active in laboratories, both in the field of research and in the creation of services/products for third parties. These staff are expert in using instruments and equipment, and train other technical staff or students, graduating students, PhD students and researchers to use them.

In Figure 4.10, which shows the number of male and female PTA staff members assigned to laboratories in the various departments requiring their presence, it can be noticed that laboratory staff are prevalently male, with the exception of one department, DASTU, where the presence of female technical staff exceeds 50%. There are three departments (DMEC, DFIS and DMAT) in which technical staff comprise only men.

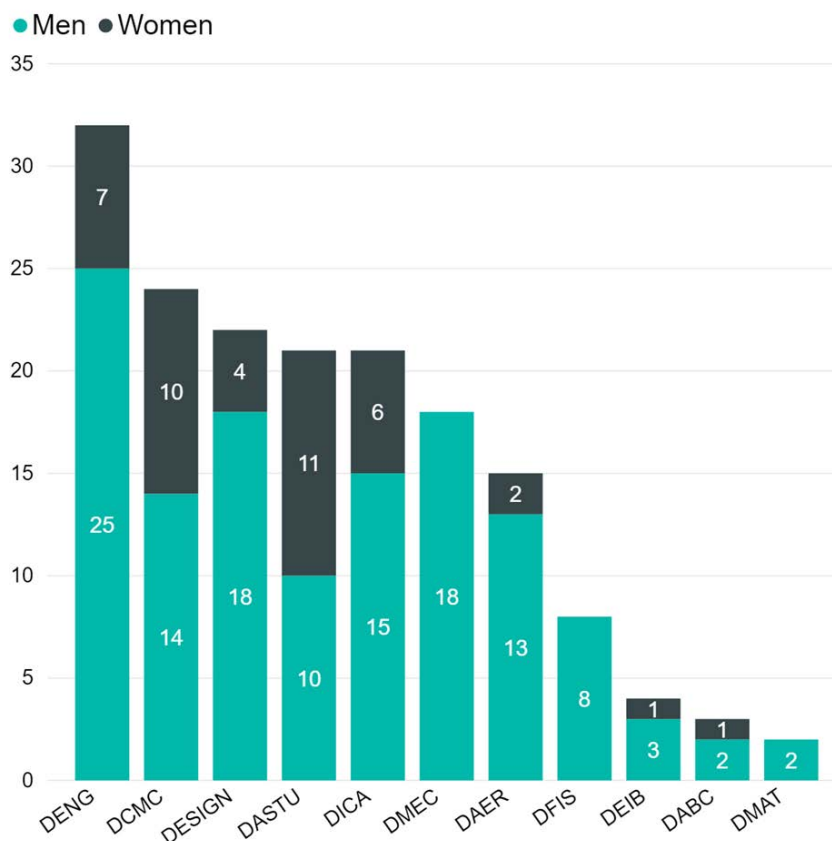
The technical professional area is strongly defined by the type of laboratory where these technicians work.

<sup>33</sup> 1 for each of the Departments plus 5 for the Campuses.

<sup>34</sup> <https://www.polimi.it/en/scientific-research/research-at-the-politecnico/laboratories/departmental-laboratories/>

To perform the activity of laboratory technician and to participate in the relative public competitions, it is important to have a specific diploma or a technical laurea (equivalent to bachelor of science) relative to the sector of the laboratory. This requisite can better explain the reason for the male prevalence, considering the lesser tendency of women to undertake studies in STEM areas, in a broad sense, and technological programmes, in particular.

Figure 4.10 Number of Technical Laboratory Staff by Departments



Finally, to complete the above analyses, Table 4.3 presents the *Glass Ceiling Index* (GCI) referred to the university's technical-administrative (PTA) staff. This index, which indicates the difficulty experienced by women in reaching higher career positions, compares the percentage of women holding the highest position in the particular structure, namely EP category women, compared to the overall percentage of women. Hence, 1 indicates the lack of differences in career advancement of women vs. men. The GCI value must, therefore, be interpreted based on the percentage of women in each structure. It can be said that the GCI is higher (1.58) than in the Departments for the University Administration (within which staff in all campuses are also counted). The university's mean (1.45) is still decidedly far from the hoped for value 1.

Table 4.3 Glass Ceiling Index of Technical-Administrative Staff (PTA) by Structures

AREA	Percentage of Women out of Total (%)	Percentage of Women EP (%)	GCI
University Administration	62.80	39.71	1.58
Departments	54.66	42.86	1.28
<b>Total</b>	59.37	40.9	1.45

#### 4.5 ANALYSIS OF ABSENCES AND OF ACCESS TO FLEXIBLE EMPLOYMENT OPPORTUNITIES

This section analyses Technical-Administrative Staff (PTA) access to the various types of leave envisaged by the National Collective Labour Contract for Universities, to identify any gender-based features. Parental leave, leave and permits established by Law 104/92 (to care for family members with severe disabilities, for parents with children presenting severe disabilities), leave for family reasons and for study-related reasons are particularly considered. In this regard, Table 4.4 reports the number and percentage of PTA staff members who, in the course of 2018, were absent for certain types of leave envisaged by the National Collective Labour Contract for Universities.

The above types of leave were taken by 758 employees out of 1,231, equal to 59.95% of the total. The percentage of women using authorised absences for all types of leave and permits is always higher than that of men. Of the 758 employees who took leave, 208 were men (27.44%) and 550 (72.56%) were women. Women who take leave are 75.14% of the total number of employees, while 41.68% of male employees take leave. The different percentage is probably due to the greater family burden of women. In fact, the absences of women are mostly for family reasons (58.23% vs. 32.12% of men) and for parental leave (10.79% vs. 4.24%).

*Table 4.4: Number and Percentage of Technical-Administrative Staff (PTA) Members who took Leave out of the total number of PTA Staff, divided by type of leave*

	Men			Women		
	no.	%	Total	no.	%	Total
<b>Parental Leave</b>	21	4.19		78	10.66	
<b>Law 104/92 art. 33</b>	28	5.59	501	51	6.97	732
<b>Leave for Family Reasons</b>	159	31.74		421	57.51	
<b>Study Leave</b>	2	0.40		6	0.82	

Considering the mean number of hours per person for type of leave (Table 4.5), it can be noticed that the number of hours of absence per person used by female PTA staff is much higher than that of their male colleagues for parental leave (297.91 hours vs. 155.23), study leave (294.17 vs. 110.00), and remains higher also in the case of leave for family reasons (28.90 vs. 21.82). Men, instead, record on average more hours of absence for leave and permits related to Law 104/92 art. 33; 326.75 vs. 191.06. It is quite impossible to interpret this data from a gender-based perspective: cases related to permits established by Law 104/92 are miscellaneous and cannot be traced to a single reason.

*Table 4.5: Mean number of hours of leave per person<sup>35</sup> divided by type of leave*

	Men	Women
<b>Parental Leave</b>	155.23	297.91
<b>Law 104/92 Art.33</b>	326.75	191.06
<b>Leave for Family Reasons</b>	21.82	28.90
<b>Study Leave</b>	110	294.17

Briefly, the above analyses reveal that, broadly speaking, the percentage of women making use of leave and permits is always higher than that of men, consistently with the traditional allocation of support and family caregiving to women.

<sup>35</sup> Calculated on the sample of PTA staff that took leave in 2018.

The same pattern can be noticed analysing flexible working methods (telework, satellite work, smart working), namely that women use them more. These points are considered below.

The university already has a consolidated history on the theme of “telework”, precisely the employee working from home, when certain requisites are met:

- activities assigned that are compatible with telework;
- special personal or family needs;
- suitable fixed workstation;
- constant connection to the employing structure;
- compliance with working hours.

It can be noticed that 73 persons are currently teleworking (with variable time percentages of 20-100%), equal to 5.93% of the total, and 63 (86.30%) of them are women. The data are significant, considering that the request for telework on the part of the staff is based on personal or family reasons, also related to support and family caregiving.

*Table 4.6 Active teleworkers - percentage of days at home*

<b>Gender</b>	<b>20%</b>	<b>30%</b>	<b>40%</b>	<b>50%</b>	<b>60%</b>	<b>80%</b>	<b>90%</b>	<b>100%</b>	<b>Total</b>
<b>Women</b>	9	0	25	1	17	3	1	7	63
<b>Men</b>	1	1	3	0	3	1	1	0	10
<b>Total</b>	10	1	28	1	20	4	2	7	73

Also regarding “Satellite Work”, which allows to work in a Structure of Politecnico di Milano that is other than the habitual workplace, equipped with temporary workstations, the offer witnesses the intensive participation of female staff, though the use of this form of flexible work is generally related to the commute time from home to work.

Finally, starting from 2018, Politecnico di Milano launched a pilot project to test innovative organisational methods of working activities, precisely “smart working”, which is characterised by certain traits:

- spatial flexibility of the work provided, namely work carried out partly in the university’s premises and partly outside, without there being necessarily a fixed workplace when work is performed outside the habitual side;
- flexible working hours, namely the performance of work strictly within the maximum duration of daily and weekly working hours, established by the law and by the National Collective Labour Contract, and coverage of the periods of joint presence and on-call service defined by the employing structure;
- value enhancement of the employee’s behavioural characteristics, of the degree of reliability, of organisational skills, of the inclination to accept responsibility;
- possibility of using personal technological devices or those assigned by the employer to carry out the work.

Politecnico di Milano is part of the 8% of Public Administrations that have activated structured projects, as described in the report 2018 “Smart Working: una rivoluzione da non fermare” [Smart Working: a revolution that must not be prevented] of Politecnico di Milano’s Smart Working Observatory<sup>36</sup>.

<sup>36</sup> [https://www.osservatori.net/ww\\_en/?\\_\\_from\\_store=it\\_it](https://www.osservatori.net/ww_en/?__from_store=it_it)



Smart Working project implementation targets PTA in service at the university and is conducted under the supervision of the Human Resources and Organisation Area that, along with the managers and persons involved, ensures constant and targeted monitoring of the process. The project's specific purposes include:

- a) promoting an organisational culture of work by goals and results, strongly enhancing the responsibility of employees regarding their work in order to increase both individual and organisational productivity;
- b) favouring reconciliation between working life and family life.

The first test (December 2018 – March 2019) involved 47 persons, over 3% of staff, whose majority was made up of women; particularly, women were 29 (61.70%), and men were 18 (38.30%).

The expansion, if any, of the project into subsequent phases in the course of 2019 will depend on the impact and actual efficacy of the new organisational models proposed.

Initial qualitative monitoring of the project seems to indicate that the project's goal to favour reconciliation between work and family life should remain one of the benefits of this form of work organisation.

This chapter analysed the university's PTA staff members, underscoring their gender-based distribution in the various positions. Unlike what occurs for university professors, there is a predominance of women among PTA staff but function-based differentiation is observed in this framework too: the female presence is more concentrated in the central administrative structures and, particularly, in areas with responsibilities of relations with the outside environment, personnel management and communication; purely technical structures and laboratories, instead, had a strong male prevalence.

Cross comparing gender-related data with data concerning the professional position reveals that a larger number of women is present in the lowest professional categories, while the female population becomes thinner as career levels progress. This evidence is confirmed by a university GCI of 1.45.

On the other hand, the analyses of data relative to the use of leave established by the law reveals that the percentage of women making use of leave and permits is always higher than that of men, in line with the traditional allocation of support and family caregiving to women.

The promotion of actions increasingly oriented at favouring more flexible working hours focuses on fostering greater gender equality when performing duties and in career advancement.

In fact, these actions aim not only to tackle a mere issue of reconciliation, but especially to create an efficient organisational and work management system that promotes and defends making the most of the worker's skills, competencies and individual traits, allowing dynamic adaptation of the working conditions to the latter's needs during the working life.

This chapter analysed the university's PTA staff members, underscoring their gender-based distribution in the various positions. Briefly, the following points can be underscored:

- unlike the situation of the university's professors, women are the majority of PTA staff (approx. 60% of the population);

- but function-based differentiation has also been observed in this framework: the female presence is more concentrated in the central administrative structures and, particularly, in areas responsible for relations with the outside environment, personnel management and communication; purely technical structures and laboratories, instead, have a strong male prevalence;
- cross comparing gender-related data with data concerning the economic position, it can be noticed that there are more women in the lowest professional categories, while a thinning of the female component can be noticed as career levels progress; this evidence is confirmed by a university GCI of 1.45;
- the analyses of data relative to the use of leave established by the law reveals that the percentage of women making use of leave and permits is always higher than that of men, in line with the traditional allocation of support and family caregiving to women;
- promoting actions that increasingly favour more flexible working hours is implemented to foster greater gender equality in the performance of duties and in career advancement. In fact, these actions aim not only to tackle a mere issue of reconciliation, but especially to create an efficient organisational and work management system that promotes and defends making the most of the worker's skills, competencies and individual traits, allowing dynamic adaptation of the working conditions to the latter's needs during the working life.



## 5. ACTIONS SUPPORTING EQUAL OPPORTUNITIES

This chapter describes the initiatives promoted and implemented by Politecnico di Milano during the last two-years and in the early part of 2019 to favour equality in the workplace and study environment between men and women, to promote gender culture and equality in all its aspects, and to encourage and support the admission of an increasing number of girls to study programmes relative to STEM subjects - Science, Technology, Engineering and Mathematics, consistently with the specific traits of the Politecnico's scientific frameworks (Architecture, Design and Engineering). The activities described were promoted and implemented by the university's competent bodies and sectors, whose actions and goals include gender equality and well-being in the workplace.

They are presented below, divided by type, and not by proposing body, to underscore the fact that reaching complete gender equality is a common goal that is shared at all levels and by all actors involved in the individual initiatives, precisely university managers when defining strategies, particularly through POP - Pari Opportunità Politecniche [Politecnico Equal Opportunities] (initiative launched in 2018), the various central administrative structures, the Guarantee Committee (CUG), along with the Confidential Counsellor and the counselling desk for work-related issues, and professors involved in teaching and research initiatives on these themes.

The working map of actions implemented during the past two years at Politecnico di Milano to promote gender equality was the first structured occasion converging activities already promoted in this framework. This first systematic monitoring process can be an important starting point to review, if necessary, actions already supported and to define new initiatives, some of which are already developed in the PAP - Positive Action Plan 2019-2021 - promoted by the CUG (available on page: [http://www.cug.polimi.it/?page\\_id=183](http://www.cug.polimi.it/?page_id=183)).

The main actions concerned:

- strategic programmes and collaborations;
- promoting STEM subjects and student orientation to choose them upon admission;
- teaching and research activities;
- training and development for staff;
- support and assistance;
- welfare;
- events.

### 5.1 STRATEGIC PROGRAMMES AND COLLABORATIONS

#### POP - Pari Opportunità Politecniche (Politecnico Equal Opportunities)

Politecnico Equal Opportunities is the strategic programme launched by the university's Rector in 2018 with which Politecnico di Milano commits to ensure a study and work environment that respects and values gender identities, different skills, cultures and origins. The POP project unfolds along five lines of strategic action: gender identity, intercultural, nationality and religious differences, sexual diversity, support for various disabilities and psychological well-being.

For each of the five action lines the university promotes and organises a plan of training initiatives and services (assistance, listening and support) designed to create an inclusive environment that allows male and female students, researchers, professors and administrative staff to follow their career successfully, both inside and outside the university.

Focus on gender equality is implemented through Gender POP, the action line that promotes equal opportunities, in order to encourage girls to choose STEM subjects, to attract more women to the Politecnico's study programmes, to guarantee female students a warm environment that supports them during their study pathway, to assist female PhD students and female researchers along their professional pathway with supportive and training actions so that they can even become role models for future female students, and to open a shared space for discussions with stakeholders to improve equal opportunities both inside and outside the university.

The first annual event in the framework of the POP programme with focus on gender-related themes and on the inclusion of women was held on 18 June 2018: the first [Diversity Data Report](#) with focus on female presence in laurea (equivalent to bachelor of science) pathways at Politecnico di Milano and on the entrance of new graduates into the job market was presented during the *Gender POP Day*.

### Collaborations

Politecnico di Milano partners companies and institutions that work for gender equality and have decided to play an active part in the development of inclusive work and study environments accommodating everyone, regardless of sexual orientation, identity and gender expression.

In this regard, Politecnico di Milano:

- partners *Parks - Liberi e Uguali* [Parks - Free and Equal], a non-profit association created to help partner companies understand and optimise the business potential associated with the development of strategies and good practices that respect diversity;
- partners *Valore D*, a grouping of companies committed to gender balance and in favour of an inclusive culture in organisations, through an integrated approach that provides companies with tools and opportunities for discussion between companies and with institutions;
- participates in the *CRUI [Conference of Italian University Rectors] Working Group on gender-related themes*, and in round table conferences on guiding themes identified by the working group (language and gender; female population following STEM careers; gender budget and method, etc.);
- participates along with another five Milanese Universities in the "Inter-University Gender Culture Research Centre" set up with the aim of lending permanent impulse to studies, researches and positive actions relating to the topic of gender cultures, and thereby contributing to the growth and dissemination of respect for women's dignity and skills. The Centre promotes and coordinates research programmes on the topic, in partnership with other institutes, both universities and governmental and international. Politecnico di Milano's member of the Scientific Committee is Professor Valeria Bucchetti from the Department of Design.

## 5.2 PROMOTING STEM SUBJECTS AND STUDENT ORIENTATION TO CHOOSE THEM UPON ADMISSION

The university organises several initiatives and allocates funds, also in partnership with companies, to encourage girls to approach STEM subjects in order to attract more women to Politecnico di Milano's study programmes. Particularly, the following concrete actions were implemented in 2018:

- a corporate scholarship (sponsored by Amazon) was promoted in favour of an enrolled female student;
- scholarships (sponsored by Politecnico di Milano) were funded to allow 20 female students of upper secondary schools to attend the technological summer school TechCamp@PoliMI organised at Politecnico di Milano ([www.techcamp.polimi.it](http://www.techcamp.polimi.it));
- a storytelling programme was offered to thirteen young female researchers/PhD students for them to learn to talk about themselves and their research, and thus become role models for future female students;

- the *Menzione speciale Ragazze STEM* [honourable mention for STEM girls] in “Politest Top Schools” was introduced to award upper secondary schools throughout Italy, whose male and female students obtain the best results at Entrance Tests to Politecnico di Milano; a special acknowledgement for the best performing senior high schools, based on the ratio between the number of female students coming from them and the standard of the entrance test mark was established in 2018;
- participation in the Milan Municipality’s project, “*Stem in the City 2018*” with three initiatives: *Presentation of TechCamp@PoliMi*; *PoliMi Open Labs*; “*Conversation with Maria Gaetana Agnesi: woman, mathematician, Milanese*”.

Moreover, through the Career Service the university organises training meetings for male and female students on themes of *diversity* and of inclusion in the job market, in partnership with companies. Five training meetings particularly focused on themes of female leadership and professionalism were organised in 2018, namely:

- 26 February 2018: Breakfast for Women with Accenture;
- 27 March 2018: Female Leadership by Boston Consulting Group;
- 04 April 2018: Women and Professional Positions – Barilla leadership Talks;
- 09 May 2018: Women’s public speaking - McKinsey workshop;
- 30 November 2018: Women at Oliver Wyman.

Other training meetings were organised in the early part of 2019, precisely:

- 08 March 2019: The Business Consulting Group consultant – comparing “role models”;
- 15 March 2019: Get inspired with Microsoft Women;
- 10 April 2019: Women’s public speaking - McKinsey workshop.

### 5.3 TEACHING AND RESEARCH ACTIVITIES

Introducing teaching and research activities at Politecnico di Milano is in line, once again, with the university’s specific themes, and meets the latest requests of the European Community, which acknowledges its growing importance to access funds for research. In our university, teaching initiatives are mainly organised by the group *DCxCG – Communication Design for Gender Cultures*, with the recent addition of activities related to Research Doctorate programmes and to other transversal ones.

The *DCxCG* group, made up of theorists and communication designers, semiologists and media sociologists of the Department of Design at Politecnico di Milano, organises research and teaching projects to promote the social responsibility of Communication Design regarding Gender Cultures. Its activity focuses on designing awareness-raising actions, information and training to define the company’s vision, contributing towards the development of communication projects that rethink “Gender Oriented” communication formats and rules. Group activities include basic research, research on training, theme and project-based research, laboratory teaching and workshops, supervision of graduation theses and more than 30 scientific publications. The main activities can be consulted at <http://www.dcxcg.org/>.

Moreover, the laurea triennale (equivalent to bachelor of science) study programme “*Communication Design and Gender Cultures*” is active from the academic year 2014-2015 to develop and favour integration between Visual Cultures (Communication Design) and Social Sciences represented by *Gender Studies* (Gender Cultures). The programme is studied to underscore the designer’s joint responsibilities in producing images and image-objects that define our daily routine, with special reference to the theme of a non-stereotypical gender representation.

As part of the university's strategic actions for the Research Doctorate programme, an inter-department scholarship was assigned in 2018 on themes related to gender bias: *“Assessing gender biases through data analytic techniques for promoting diversity and inclusion in entrepreneurial and organization contexts”*, organised by the Department of Management, Economics and Industrial Engineering and the Department of Electronics, Information and Bioengineering. Moreover, the programme *Complementary Doctoral Skills* was added within the scope of the Manifesto of interdisciplinary doctoral programmes offered by the PhD School for academic year 2018-19. This modular programme offers training centred on gender prejudice, gender culture, discrimination and technologies.

Transversal initiatives include the teaching project conceived in partnership between Politecnico di Milano, Sevensgrams 7Gr Srl, an innovative coffee manufacturer with an all-female governance, CGM Cooperative Group, leading Italian network of social cooperatives, and Spazio Aperto, which has conducted business throughout Italy for the past 5 years. Starting from October 2018, the Department of Management, Economics and Industrial Engineering has hosted *Tilde's - Coffee and Stories*, an entrepreneurial project designed to promote female occupational inclusion in Italy to ensure the economic independence of disadvantaged women.

Finally, the transdisciplinary research unit *“Promoting diversity and gender equality in education, science, and in society as a whole: a multi-disciplinary approach”* was started up in February 2018, with the Rector's approval. It develops tools that detect, characterise and quantify gender bias, whether intentional or unintentional, and identify the short and long-term consequences in order to design mitigating actions and to avoid activating them in the future. These tools are also used to promote policies leading to inclusive organisations and - broadly speaking - contribute to create an inclusive society. This unit involves six university departments: Management, Economics and Industrial Engineering, Electronics, Information and Bioengineering, Design, Architecture, Construction Engineering and Built Environment, Architecture and Urban Studies, and Mathematics.

#### 5.4 LEARNING AND DEVELOPMENT FOR STAFF

The Guarantee Committee and Human Resources Area have launched several activities to prevent and fight the various forms of discrimination, raising awareness and informing male and female students and workers about gender-related themes and activities organised by both the university and the Committee.

The following initiatives are particularly indicated:

- well-being in the university, 3rd Seminar: mobbing, discrimination, organisational dysfunction and other situations of a *“sick working environment”*. Events, prevention, the test and damages, by Maria Grazia Ciperio, contact person at the Counselling Desk for work-related issues, and Annalisa Rosiello, Confidential Counsellor of Politecnico di Milano (23 January 2017);
- the professional development project *“Knowing people”*, conducted by the Human Resources and Organisation Area for all university staff. The project uses group meetings, individual interviews and diagnostic assessment meetings to broaden the knowledge of staff in terms of characteristics, expectations and motivation. The project (held in 2016 and 2017) witnessed the participation of 75 women and of 35 men, and conveyed, particularly to women, an important message of attention, involvement and *commitment* towards their professional development.

The Politecnico also offers training centred on themes of *diversity* and *inclusion*, based on the collaborative use of new technologies. The METID service (Innovative Teaching Methods and Technologies) actively participated in this specific setting, cooperating in the organisation of online courses within the framework of the following funded projects:

- 2017: MOOC Embracing Diversity Polimi Open Knowledge (POK); funded by Project Erasmus+ IN2IT (Internationalization by Innovative Technology), sponsored by the European Commission to promote internationalisation of universities by exploiting the potential partnership and interaction offered by the latest technologies, raising awareness particularly regarding gender issues and sexual orientation;
- 2019: *Project D-STEM – MOOC Embracing Diversity T.I.M.E. Special Edition*, funded by *TIME Association (Top Industrial Managers for Europe)*, which envisages a special edition of the MOOC, enriched with new contents focused on the negative effects of stereotypes regarding both gender and STEM. Online activities are proposed, inviting participants to reflect on their bias, sharing them and comparing notes to adopt a new inclusive approach to guide them through the process of overcoming these issues.

Finally, initiatives implemented in partnership with the Association Valore D must be mentioned:

- 2017: *Unconscious Bias, Energy management, Meeting management*;
- 2018: Cross-Company Mentorship pathways;
- 2018: Research “Ageless Talents” on the knowledge of workers over 50 years;
- 2019: *Managing the x factor, Happiness in the company, Learning to Trust*.

## 5.5 SUPPORT AND ASSISTANCE

### Economic support

In the framework of actions implemented by the strategic plan POP (Pari Opportunità Politecniche [Politecnico Equal Opportunities]), economic support will be provided for female researchers who decide to return to research work soon after maternity leave by guaranteeing the Politecnico’s crèche service, which is offered free of charge to PhD students who have become mothers. Particularly, for 2018 our university guaranteed a contribution of 15,000 € for four researchers returning from maternity leave, and coverage of the Politecnico’s crèche fees for five PhD students who became mothers, for a total of 16,720 €.

### Assistance upon returning to work

The Human Resources and Organisation Area, following the results attained by “Project Maternity and Work - a possible enterprise” (2010-2015), continues to favour a positive reintegration into the work context, dedicating a moment of professional counselling to female employees who return to work after maternity leave or after a medium-long period of absence. The themes discussed during these meetings concern reconciliation of family and professional life, work-related expectations and/or concerns, and any criticalities concerning the organisation of work upon returning. Between 2016 and 2017 twelve interviews were conducted with female members of the Technical-Administrative staff who participated of their own free will.

## 5.6 WELFARE

Politecnico di Milano has internally organised a series of welfare initiatives in various sectors for staff: organisational well-being, healthcare, cultural and training events, life-work reconciliation. The university’s most significant commitments in the welfare sector, in terms of resources and economic investment, are measures designed to improve the work-life balance with crèches and hospitality centres for the staff’s children.

### Crèches

Two crèches have been opened at Politecnico di Milano, one at the Leonardo Campus and one at the Bovisa Campus. Moreover, since 2014 there has also been an agreement with a private crèche at the Lecco Campus.



Starting from academic year 2013/2014, the ISEE income category system has been introduced to determine the fees of the Politecnico's students, and the service has been extended to users not employed by the university (male and female research fellows, PhD students and students). Early monitoring processes (2015) have revealed the initiative's positive effect in increasing the service's internal users, with a subsequent rise in the overall occupation of the crèches. In 2017-2018 the two crèches accepted overall thirty-eight children, with a very high percentage of internal users (94%); the service was used by two children in Lecco.

### Hospitality Centres

During the summer and Easter school holidays a hospitality service is organised for employees' children aged 4 years (first year of nursery school) to 13 years (final year of lower secondary school). The cooperative "Il Melograno" runs the summer camp from 2015 and the Easter camp from 2016. The service is provided in the two Milan campuses. In 2017 the summer camp was used by one hundred and twelve users; in 2018 the number rose to one hundred and twenty-five. In 2017 the Easter hospitality centre was attended by twenty-one users, and by twenty-two children in 2018.

## 5.7 EVENTS

Politecnico di Milano promotes gender-related themes even with a series of events targeted at all staff and residents of the city, often organised in close cooperation with other local institutions and various agencies. The events proposed in 2018 and in the early part of 2019 centred on issues related to gender equality from multi-faceted perspectives spanning historical-political reconstructions, fighting gender violence, homophobia and discrimination, gender health and regulations concerning the salary gap. The main points are enlarged on below.

### Meetings on the fight against discrimination, in partnership with CUB Donne

- Gender discrimination: judgement actions. Reflections on Italian and European legislation, Tatiana Biagioni - lawyer, president of CPO avvocati Milano, former Councillor for Equal Rights (province of Milan, 25 September 2017)
- History of women's thought and movements, Eleonora Cirant - journalist and essayist, librarian at the National Female Union (5 October 2017)
- anti-discrimination policies in the workplace, Grazia Morra - trade unionist CUB Padua, former Councillor for Equal Rights (province of Venice, 19 October 2017)
- Gender Health, Tiziana Vai – Occupational Medicine Specialist at Milano Città Metropolitana LHA - The salary gap in women's pay slip Maternity and paternity leave: rules and rights, Maria Quarato, trade unionist CUB Milano (9 November 2017).

### Conferences on gender-related themes

- Gender perspective: an opportunity to grow that cannot be missed. Study day organised in partnership with the Inter-University Gender Culture Research Centre (10 November 2017).
- AIDIA. 60 years without ageing, conference organised in partnership with the Italian Association of Female Engineers and Architects (23 November 2017).
- Symposium: gender perspective in research and university (15 March 2019).

### Other meetings

- Three Politecnico women, with Carmen Giordano, Simona Chiodo, Camilla Colombo. Three women, three research pathways, three stories to be heard. Meeting organised as part of the review Tempo di Libri [Time for Books] (8 March 2018).

- Fascists, partisans, nuns, housewives, spies, poor devils: women forced to choose. The Resistance Movement in Milan: itinerant seminar (24-25 April 2018).
- International Day against Homophobia. For an inclusive culture that respects differences (16 May 2018).
- Well-being, fair treatment and fighting discrimination (13 December 2018).

### Drama

- Natalia and the profession of writing, with Itala Cosmo, Ida Spalla and Giulia Ucheddu (7 March 2017).
- Barbie's version, with Alessandra Faiella (5 March 2018).
- Malanova, produced by Sciarra Progetti Teatro and Teatro Verdi of Fiorenzuola d'Arda with Ture Magro (29 January 2018).
- Le Maschie [The Tomboys], La Baracca Theatre, written and interpreted by Maila Ermini (7 March 2018).
- Nora – Beyond the Silence (5 December 2018).

## 5.8 ECONOMIC RESOURCES ALLOCATED FOR WELFARE AND EQUAL OPPORTUNITIES

As already mentioned, the university has allocated dedicated funds for actions designed to improve the well-being of employees and collaborators of Politecnico di Milano and to support equal opportunities.

Regarding initiatives generally related to the area of organisational well-being, the university has implemented several welfare actions<sup>37</sup> in all fields allowed by the National Collective Labour Contract:

- the university annually arranges funds, approx. 75,000 € a year, that facilitate the purchase of ATM season tickets;
- economic aid is issued based on specific requests;
- from 2016, healthcare insurance has been taken out for university staff, at a cost of 90,000 € a year;
- experimental implementation of a university Welfare portal has been launched. It will be published online in 2019. Every employee may use a "virtual purse" of approx. 200 € per person (with overall university funds of approx. 200,000 €) to freely access services and initiatives organised within the scope of the aid, as established by the regulation.

Specifically referring to actions designed to support equal opportunities, the table below (table 5.1) reports evidence of funds allocated in the past three-year period (budget 2016-2018) and the main one-off allocations arranged by the 2018 financial statement.

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<sup>37</sup>With due regard to the regulation in force, some services are targeted at all employees and collaborators of Politecnico di Milano, while others are only for Technical-Administrative staff.

*Table 5.1: Resources allocated in favour of equal opportunities*

	2016	2017	2018	2018 ad hoc funding	Funder
Contribution to crèche and summer	130,000	130,000	130,000		university
Support for Guarantee Committee activities	40,000	40,000	40,000		university
Project POP - Pari opportunità Politecniche				500,000	university (biennium 2018-2019)
Counselling service desk	11,000	11,000	11,000		
Telework	90,000	162,500	200,000		university
Smart working			92,500		university
Project IN2IT – MOOC Embracing Diversity				45,000	Erasmus Plus
Project D-STEM – MOOC Embracing Diversity T.I.M.E. Special Edition				15,000	T.I.M.E. Association
Agreement on value D	5,000	6,000	6,000		university
<b>TOTAL</b>	<b>276,000</b>	<b>349,500</b>	<b>479,500</b>	<b>560,000</b>	

The university specifically funds the activities of the Guarantee Committee, with which it implements training initiatives, events and specific activities: annual contribution are provided to co-fund the fees of the crèche and summer camps organised when schools are closed - these are always managed through the CUG; investments are made for specific resources required to startup workstations for telework and smart working and for counselling service desk management. Moreover, in 2018 a huge three-year ad hoc funding scheme was arranged to support all activities implemented as part of the POP project (activation of scholarships, economic support schemes, training activities and events). Always in 2018, as mentioned above, the university received external contributions for specific projects promoting equal opportunities.



## CONCLUDING NOTES

This first edition of Politecnico di Milano's Gender Budget provides a formal report of the university's situation in terms of gender equality, creating an effective quantitative analysis tool that can be used as a starting point both to evaluate the future evolution and to monitor the impact of concrete actions implemented by the university on this topic.

Moreover, by drawing up this document, Politecnico di Milano has applied the indications of CRUI and of MIUR, actively participating in open round table conferences held at the CRUI on gender-related themes.

Starting from preliminary internal experiences conducted at the university to explore gender equality in view of drawing up the document, the gender budget thus presents a photograph of the university's current situation, particularly analysing population, employment and study pathways of the subjects involved. Specifically, the student population, professors and technical-administrative staff were analysed in detail, showing, where possible, the evolution in time of proportions between men and women observed by the various studies conducted in a broad timeline (2000-2018). In addition to the above analyses, the policies, measures and positive actions adopted and funded by the university to promote equal opportunities are also presented from various perspectives.

Furthermore, preliminary work and data collection carried out to draw up the document revealed the good practices that must be followed to collect and rationalise the data of interest, thus also starting internal processes to edit and integrate the existing databases. This may obviously benefit the university's organisation and effectively support decisional processes for the implementation of gender policies, and more besides.

In the future, data presented this year will be collected and processed to identify any variations in the current situation and for an in-depth study of certain important themes. For instance, the next edition will study the position of international students in terms of gender equality, evaluating the impact of the flow of students to and from other universities during the study pathway. Instead, regarding professors, the position of research fellows and of untenured assistant professors will be explored in detail. In fact, the university's recent decision to fund one hundred positions for untenured assistant professors during the next three-year period will increase this population, and it will be interesting to monitor its impact on gender equality. Finally, regarding technical-administrative staff, the effect of policies supporting flexibility will be actively monitored to verify their efficacy and influence on the well-being of those who make use of them.

Overall, the experience of drawing up the Gender Budget has doubtless enriched the university in terms of awareness of its situation. It has established firm grounds to share its commitment both inside and outside the university in order to promote gender equality and values related to diversity and inclusion, founding factors for the life of both the institution and its people.

