POLITECNICO MILANO 1863

School of Industrial and Information Engineering

The training experience offered to the students of the Master's Degree in Materials and Nanotechnology Engineering

What does a Materials and Nanotechnology Engineer do?

A Materials and Nanotechnology Engineer is a highly specialized professional who can work in industries that produce, transform, refine, analyze, and recycle materials, in sectors related to the chemical, mechanical, electrical, electronic, telecommunications, energy, construction, transportation, medicine, environment, and cultural heritage industries. In these sectors, they can work as:

• materials expert, capable of conceiving, designing, and developing new products using both traditional and nanotechnologies;
• process technologist, capable of designing, programming, and managing systems and equipment for the production and transformation of materials; • product designer, with skills ranging from the atomic scale to large civil and industrial infrastructures.

The main activities in which he may be involved include:

• research and development on all classes of materials;
• design of production plants and machinery; • technical management of production, finishing, and recycling plants; • process and product innovation; • safety and environmental protection; • design of innovative applications.

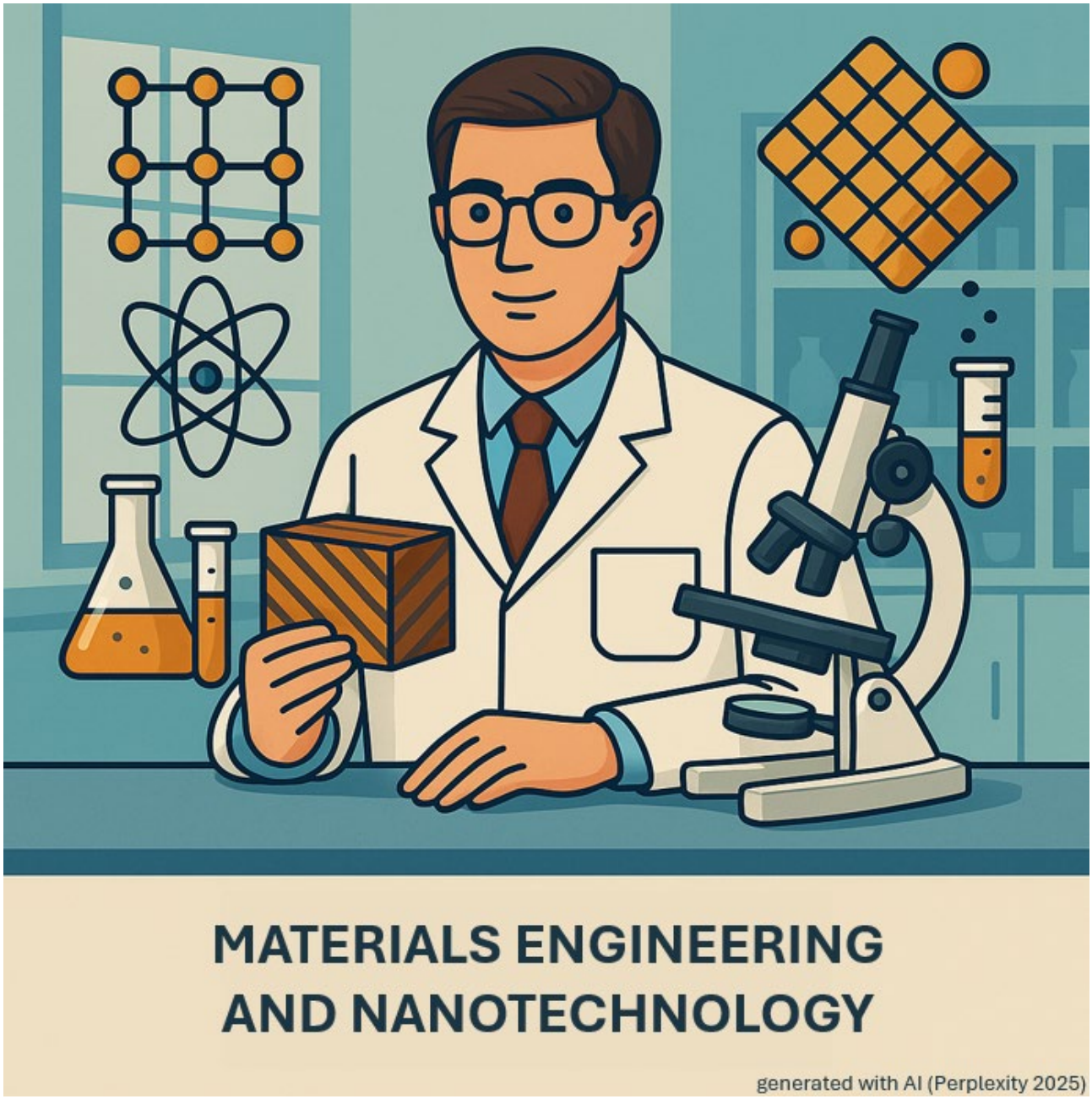
Within the company, the materials and nanotechnology engineer collaborates effectively with various functions, including:

• safety and environment manager;
• purchasing manager; • human resources manager.

It can also coordinate research and development projects, participate in technical discussions of trade associations, and contribute to the work of national and international standards bodies.

MSc graduates in Materials Engineering and Nanotechnology can practice as a freelance Senior Engineer, join the Order of Engineers after passing the State Exam, and perform all professional activities required by current legislation.

This engineer has the knowledge to continue their studies with a doctorate in Materials Engineering or related disciplines such as materials science, nanotechnology, and others. Furthermore, if they have sufficient credits in certain areas, they can take the entrance exam to become a secondary school teacher, according to current regulations.


MATERIALS ENGINEERING
AND NANOTECHNOLOGY
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What do you study?

The **Degree Program** (*Manifesto degli Studi*), divided by academic years and semesters, is the set of educational activities (courses, laboratories, internships, final examinations), either compulsory or elective, that make up the educational offer of a Study Program (*Corso di Studi*).

The **Study Plan** (*Piano degli Studi*) is the list of educational activities that the student intends to undertake during each academic year. The Study Plan is normally compiled by selecting educational activities from the offer defined in the Degree Program (*Manifesto degli Studi*) of the student's own Study Program. In this case, the Study Plan is automatically approved.
Students may also request to include, for the purpose of obtaining their degree, courses/laboratories offered by Study Programs other than their own. In such cases, the request is subject to approval by a dedicated committee, which assesses its consistency with the educational objectives described in the Academic Regulations (*Regolamento*) of the Study Program.

The *Credito Formativo Universitario* - *CFU* (**University Educational Credit - ECTS)** is the unit of measurement of the workload required in terms of learning activities. One credit conventionally corresponds to 25 hours of work, including both self-study/individual work and assisted teaching activities, meaning all educational activities in which the student interacts with the instructor (lectures, group exercises, laboratory activities, etc.).

Every year, at the beginning of the academic year, students starting their MSc program are offered a Lesson Zero, during which the program coordinator explains the organization of the study program. The meeting aims to explain to new students, many of whom come from foreign universities, how the University is organized, its governing bodies, and the most important contact persons for students, whom they can turn to in case of need. The specific features of the program are also explained during this meeting.

All MSc courses maintain a clear distinction between theoretical lectures and exercises (numerical, practical, or laboratory). This approach is essential to helping students understand the difference between theoretical concepts and their practical application, and to learn the most effective methods for putting them into practice.

Teaching materials also follow this logic. Instructors provide texts and handouts for theoretical study, along with exercises with solutions to support the practical application of concepts. In some courses, exam samples from previous years are also provided to help students familiarize themselves with the required level of depth and practice independently.

Finally, the degree program includes numerous laboratory-based courses, both experimental and numerical, which allow students to explore advanced topics and innovatively address the most current challenges in materials engineering and nanotechnology.

As for the contents, a brief presentation divided by year follows.

1. First year

From the first year, the study program offers specialized courses in six different areas: engineering applications, nanostructured materials, polymeric materials, surface engineering, sustainability, and materials for electronics. Students have a total of 15 elective credits, of which at least 5 credits must be chosen for laboratory activities within the already extensive and continually expanding program. The introduction of laboratory activities reflects, on the one hand, the consistently expressed desire of students to develop greater hands-on practical skills, and, on the other, the need to provide students with training through activities other than traditional study. The laboratory program includes both project experiences and computer labs and practical workshops.

Additionally, students are beginning to have access to seminars and visits organized by individual instructors with relevant industrial companies. For example, in 2024, three company visits were organized as part of curricular training activities.

The assessment methods mirror those already seen in the bachelor program, i.e., a majority of written exams with the possibility of supplementary oral exams.

2. Second year

The second year consists of a first semester of mandatory exams, which complete the curriculum common to all materials and nanotechnology engineers, followed by a second semester of 10 credits of elective courses and 20 credits dedicated to the thesis project. The thesis can be completed in one of the University's laboratories, or alternatively in a company or external research center, in both cases consistent with the educational objectives of the degree program. Seminars in collaboration with companies continue in the second year, at the initiative of individual professors within their courses.

The assessment of learning in the courses offered is similar to that described above. Additionally, some courses offer group project work as an additional cross-curricular learning opportunity to develop teamwork and achieve deadlines. The thesis is completed with a discussion of the completed work before a committee of faculty members from the study program, experts in the specific field of the thesis, with the aim of strengthening the candidate's soft communication skills.

Interdisciplinary Programs

- **PoliMI Ambassador**

The PoliMI Ambassador programs are four advanced university-level training paths designed to create new professional profiles in Green Technologies, Smart Infrastructures, Inclusivity Design, and Creative Thinking. The objective is to foster the acquisition of:

- skills in specific areas consistent with the selected educational path;
- enabling digital technologies relevant to the profile;
- interdisciplinary tools and methods, and a systemic vision mindset;
- the ability to work in interdisciplinary and multi-sectoral contexts, developed through exposure—also in team settings—to case studies and challenges.

For a detailed description of the objectives of each PoliMI Ambassador program, please refer to the PoliMI Ambassador webpage.

Each educational path is developed throughout the *Laurea Magistrale* (equivalent to Master of Science) and defines, within 130 *Crediti Formativi Universitari* (University Educational Credits – ECTS), of which at least 10 must be extra credits, the minimum number of credits required to obtain the selected *Laurea Magistrale* degree and, at the same time, to receive the PoliMI Ambassador certification in the selected field.

The student must acquire at least 30 *CFU* (ECTS) in educational activities relevant to the chosen PoliMI Ambassador profile, selected from two course tables listed in the *Regolamento Didattico del Corso di Studi* (Study Program Educational Rules) of their program. In particular, the student must obtain at least 10 CFU from the first table (Table A) and 20 CFU from the second (Table B), in accordance with the procedures described in the Study Program **Educational Rules**.

The "PoliMI Ambassador" certification will be included in the Diploma Supplement and will be officially recognized through the issuance of a specific digital badge.

Failure to earn the 10 extra *CFU* (ECTS) and the minimum 30 *CFU* (ECTS) in activities related to the Ambassador profile does not preclude the student from obtaining the *Laurea Magistrale* (Master of Science) degree.

Since its inception, the program has participated in the interdisciplinary "Polimi Ambassador" project, aimed at training students in the field of "Green Technologies." Program faculty, in collaboration with faculty from other study programs, have proposed courses included in this program, available as electives in the degree program.

What are the teaching methods?

Teaching and learning models

The educational model of the Politecnico di Milano includes five types of assisted teaching:

- Transmissive / Lecture-Based Teaching (Didattica trasmissiva/frontale – DT): the student listens to the delivery of content that will then be consolidated independently;
- Interactive / Participatory Teaching (Didattica interattiva/partecipativa - DI): the student, under guidance, is involved individually or in groups in carrying out or participating in an activity proposed by the instructor, also through the use of suitable digital tools;
- Laboratory-Based Teaching (Didattica laboratoriale - DL): the student is involved, individually or in groups, in a practical experience aimed at applying the concepts and methodologies presented by the instructor, typically with the aid of appropriate tools and equipment in computer or experimental laboratories;
- Project-Based Teaching (Didattica progettuale – DP): the student is involved, individually or in groups, in the development of a complex project or product, which is gradually enriched as awareness and the ability to use theoretical, technical, and metacognitive tools are acquired;
- Evaluation-Based Teaching (Didattica valutativa - DV): the student is directly involved in an evaluation or self-evaluation activity followed by appropriate feedback (quantitative or qualitative, and either named or anonymous).

The MSc Study Program adopts a more complex teaching approach than the BSc Study Program, based on different teaching methods that are adapted over time to meet specific learning objectives.

As highlighted in the Teaching Mix Table, while maintaining a significant share of traditional lecture-based teaching, the course offers a good balance between the various forms of teaching, including exercises, laboratory activities and other active methodologies.

The data shown in the table is representative, as the degree program includes numerous elective courses. This allows students to customize their educational path based on their interests and professional goals.

TABLE OF TEACHING METHODS

	DT	FROM	DL	DP	DV
Year 1 – Semester 1	75%	19%	0%	4%	2%
Year 1 – Semester 2	66%	7%	11%	16%	0%
Year 2 – Semester 1	79%	14%	0%	7%	0%
Year 2 – Semester 2	55%	45%	0%	0%	0%

What are the assessment methods?

Assessment methods and exam sessions

The assessment methods are described in the course syllabus (scheda dell'insegnamento) and are made available at the beginning of each academic year. By including a course in their Study Plan, students acknowledge and accept the related assessment methods.

Student performance is assessed through exam sessions held during the dedicated periods specified in the Academic Calendar (*Calendario Accademico*), and may also be evaluated through ongoing assessments (*valutazioni in itinere*) conducted during the semester in which the course is delivered.

For each academic year, there are five exam sessions scheduled for all courses. Specifically, two exam sessions take place at the end of the semester in which the course is taught, two at the end of the other semester, and one in September.

Ongoing assessment

Ongoing assessment may take place through various methods, such as: written and/or oral and/or laboratory tests, projects, reports, assignments, and other types of activities assigned by the instructor, carried out either in class or independently, also through the use of digital and online tools.

Ongoing assessment based on two partial exams. For courses that include an ongoing assessment based on two partial exams, the tests are generally held during the breaks in teaching activities specifically scheduled in the Academic Calendar. The date of the second exam coincides with that of the first exam session in the session immediately following the teaching semester. On that date, the student may take either the second partial exam or the regular *exam session*.

Other forms of ongoing assessment. Forms of ongoing assessment other than those described above may take place at any time during the teaching semester. For courses that include them, some assessed activities, clearly indicated in the course syllabus, may be mandatory or required in order to receive a full evaluation. Failure to participate in such activities may result in restrictions during the exam sessions, either in terms of grading or in the ability to take the exams.

Registration for exam sessions

In order to take part in an exam session, students must register via the Online Services within the specified deadlines. Exam registration is permitted only if the student is up to date with tuition fee payments and the course is included in his/her Study Plan. If the regular registration deadline is missed, it is still possible to register until 11:59 PM on the day of the exam, subject to approval by the professor. Students who decide not to take the exam must cancel their

registration no later than the day before the exam, except in cases of unforeseeable last-minute impediments.

In the compulsory courses of the first semesters of the Degree Program, the written exam still represents the predominant assessment method, as highlighted in the following table.

Conversely, elective exams offer a greater variety of exam formats, selected based on the learning objectives and specific content of each course. In these cases, assessments tend to be more interactive: written tests are often replaced by oral exams or supplemented by practical activities.

In particular, in courses that include numerical or computer labs, written tests may include the use of specific software learned during the course, thus introducing more practical and professionally relevant assessment methods.

The summary table shows the percentages for the different assessment methods, calculated based on the number of course credits. This data is intended to be representative, but may vary depending on the student's personalized study plan.

The final exam is not included in this analysis and will be treated separately.

TABLE OF ASSESSMENT METHODS

	Written exam	Mandatory oral exam	Optional oral exam	Mandatory project	Optional project	Exam using software
Year 1 – Semester 1	100%			40%		
Year 1 – Semester 2	25%	50%	25%			13%
Year 2 – Semester 1	100%	33%		33%		
Year 2 – Semester 2	0%	100%				

What does the final exam consist of?

On the website of the School of Industrial and Information Engineering, under the section Bachelor's and Master's Degree Exams, the following resources are available:

- The regulations for Bachelor's and Master's degree exams, along with the *Regolamenti Integrativi* (supplementary regulations) for each *Corso di Studio* (Study Program);
- Information on how the examination sessions are conducted, key deadlines, and the procedures for submitting the thesis;
- Thesis templates: formats for traditional and article-style theses, as well as the executive summary template, which must be submitted together with the thesis in case a *Controrelatore* (Examiner) is required.

The final exam consists of writing a thesis describing the work undertaken during the internship or research period. The thesis is developed under the supervision of a supervisor, usually a university professor with expertise in materials engineering and nanotechnology.

The thesis must address a theoretical and/or applied research topic, with innovative content compared to the current state of the art. The work may be experimental or computational modeling in nature. The proposed topics are generally related to the basic or applied research lines developed in the laboratories associated with the program. Students encounter these topics both during teaching activities and through direct discussions with faculty.

The thesis can be carried out at the University laboratories or, with the prior authorization of the Study Programme Council, at external institutions such as industrial or public research laboratories, or other Italian or foreign universities.

The work completed is presented and discussed before a graduation committee. During the discussion, the candidate must demonstrate mastery of the topics covered, the ability to work independently, and the ability to communicate clearly and effectively.

The evaluation methods and details on the final exam are specified in the Educational Rules of the Study Program.

At the beginning of the second year, the program coordinator organizes a meeting for all students. During this meeting, representatives of the main research groups active in the program present the general themes of their activities.

The aim of the meeting is to offer a comprehensive overview of available research opportunities, also for the benefit of those students who, having not chosen certain

elective courses, may not have had the opportunity to directly experience certain professors or research areas.

Can I get help with my studies?

Tutoring

In order to guide and support students throughout their studies, particularly during the first three years, the School of Industrial and Information Engineering offers various tutoring opportunities, with the aim of providing each student with the most suitable support for their needs. The approach includes peer-to-peer tutoring services, activated on demand based on student requests, as well as more traditional tutoring services offered on fixed dates and times.

- **Learn how to Learn (Information and guidance tutoring)**

Targeted at first-year students who scored below 60 on the TOL, this is an optional program consisting of three thematic webinars designed to help students immediately identify effective strategies for managing typical university situations, such as attending lectures, studying independently, managing study time, and handling distractions.
To complement the live component, asynchronous activities are provided to deepen the topics addressed during the webinars.
The program is delivered in September (over the course of one week), before the start of classes. Interested students receive a notification email inviting them to participate.

- **Peer to Peer Tutoring**

In this form of tutoring, experienced student tutors provide support, either individually or in small groups of 3–4 students, on the core courses taught during the first two years of all *Corsi di Laurea Triennale*(Bachelor's Laurea Programs). Students may request tutoring for up to two courses per semester.
Those who wish to request a tutor must apply through the "Peer-to-Peer Tutoring" platform available on their Online Services.
For further information, please contact: tutorato-ingegneria@polimi.it.

- **Tutoring for first-year students**

For many of the first-year courses of the *Bachelor's degree program*, tutoring sessions are available and led by PhD students or experienced instructors.

The calendars are available on the School's website at the page: Calendario Tutorato Matricole (*First-Year Tutoring Calendar*).

- **Specific tutoring activities**

The School also promotes specific tutoring initiatives:

Equalization peer-to-peer tutoring: this service is intended for students coming from Bachelor's degrees not strictly aligned with the chosen *Master's degree program*, or for international students. More experienced student tutors provide support, either individually or in small groups of 3–4 students, on courses within the Master's *Study Programs*.

Tutoring in support of specific courses: tutoring sessions held by PhD students and experienced instructors on selected courses from various study programs, also based on student feedback.
The schedule for these activities is available on the website at: *Calendario tutorato specifico* (*Specific Tutoring Calendar*).

Polimi Open Knowledge (POK)

POK (Polimi Open Knowledge) is the first Italian university MOOC (Massive Open Online Courses) platform, offering free online courses open to everyone. The main objective of the platform is to support students, not only from Politecnico di Milano, throughout their university and professional journey: from high school to university, from the *Bachelor's degree* to the *Master's degree*, and from university to the job market.
In addition, many other courses are available for teachers, researchers, professionals, and the general public.

First-year students who wish to strengthen their foundational knowledge in mathematics and physics are encouraged to follow the modules: Introduzione alla matematica per l'università: Pre-Calculus, *Introduction to Experimental Physics: Electromagnetism, Optics, Modern Physics*.

Like all study programs at Politecnico di Milano, Materials Engineering and Nanotechnology also offers a tutoring service designed to support students throughout their entire education. The goal is to support them in their studies and overcome any difficulties related to course attendance.

Tutoring includes personalized initiatives, designed based on students' specific needs, with a particular focus on the Bachelor. The service is managed by student tutors and faculty and covers various areas: from orientation on study organization (such as the structure of study plans and the services offered by the Politecnico) to support in resolving teaching-related issues or assessment procedures.

There are various types of tutoring available to specifically address students' needs: from peer tutoring, available upon request, to traditional tutoring, organized at pre-established times and dates.

Specifically, a peer-to-peer tutoring service is available, where expert student tutors offer individual or small group support (3-4 people) on core courses for the first two years of the bachelor study program. In the 2023-24 academic year, 10 students took advantage of the service for a total of 300 hours of tutoring, with the involvement of 8 tutors. In the first semester of the 2024-25 academic year, 10 requests have already been received, for a total of 200 hours, again with 8 active tutors.

In recent years, some MSc courses have introduced specific tutoring activities with the aim of offering greater opportunities for in-depth study and more effectively managing the high number of course attendees.

These activities primarily consist of additional exercises, during which students can complete exercises with the support of a tutor. The tutor is also available to clarify doubts, answer questions, and provide explanations on the topics covered in the course.

Are there any extracurricular activities?

Passion in Action

"Passion in Action" is the catalogue of open-participation educational activities offered by Politecnico di Milano to its students, aimed at fostering the development of transversal skills, soft and social skills, and at encouraging/facilitating a personalized enrichment of each student's personal, cultural, and professional background.
Those who are interested can take advantage of this opportunity and choose which activities to attend, exploring different subjects according to their interests and personal inclinations.

Students who participate in *Passion in Action* may register for any activity in the catalogue, regardless of its thematic relevance to their *study plan*, provided that any specific prerequisites for individual activities are met.
The skills and competencies acquired are recognized through the awarding of a digital badge and will be reported in the *Diploma Supplement*.

The catalogue is updated regularly. Since the educational modules are activated asynchronously with respect to the semesters, interested students are advised to check the *Passion in Action* page periodically.

Student Associations

Student associations are organizations formed by students with the aim of promoting cultural, technical, social, and recreational activities, and creating opportunities for personal and professional growth within the academic environment.
Participating in a student association allows for greater engagement in university life, making the academic experience more dynamic and stimulating. It also fosters the development of transversal skills such as leadership and teamwork, as well as the expansion of one's network, valuable both during university and in professional life.
At Politecnico di Milano, several student associations are active, each with different goals and areas of interest. The full list is available at: *Student Associations*.

Extracurricular activities take place primarily at the MSc level and include seminars, workshops, and visits to industrial sites, organized in collaboration with leading companies in the sector. Some examples: a visit to the Isover production plant (glass wool); a workshop with SAP (management software); and a workshop with H&M (fashion materials).

A "Passion in Action" course was also launched in the past, focusing on the Six Sigma methodology, a cross-disciplinary skill highly valued by companies when recruiting. The possibility of offering a new edition is being evaluated in the future. These initiatives are also based on individual instructor suggestions.

On a more structured level, an annual meeting is organized with the Corporate Reference Committee of the Study Program, offering students the opportunity to interact directly with representatives of companies operating in the fields of Materials Engineering and Nanotechnology.

Finally, thanks to the collaboration with the JRP Chanel Project Management Committee, every year second-year MSc students are invited to participate in the Hackathon organized by Chanel, dedicated to the themes of circularity and sustainability in fashion. In the 2024 edition, one of the two winning teams included one of our students.

While not strictly speaking extracurricular activities, there are numerous initiatives promoted by student associations. In particular, we'd like to highlight some of the associations that best represent our program and the typical experience of a Materials Engineering and Nanotechnology student.

NINE – Nanoscience Innovation and Nanotechnology Engineering: the network for students interested in nanotechnology. Collaborations with professionals, startups, research institutions, and companies in the sector will allow you to learn and develop knowledge on the most current research and development topics in the nano world! Fun fact: the association's logo recalls both the more famous fullerene and the characteristic hexagon of graphene!

ENACTUS: Enactus is a global nonprofit network present in over 30 countries, engaging students, faculty, and professionals to address the world's most pressing challenges. Through entrepreneurship, Enactus teams implement projects inspired by the United Nations Sustainable Development Goals (SDGs), aiming to build a more sustainable future for all by fostering skills development, talent discovery, and increased awareness of professional opportunities.

ESN: ESN Italy is an organization that supports international students arriving in Italy through the Erasmus program. It welcomes them, organizes social and cultural events, and helps them with everyday life (such as finding accommodation or navigating bureaucracy). It operates in many Italian universities and also offers opportunities to meet other students and make new friends. Italian students can volunteer to help others and learn new things.

Can I go and study abroad for a period?

Students who wish to take part in an exchange experience must apply through one of the two international mobility calls, which are published in November and April. The University's Mobility Call covers various types of international experiences: simple exchange (1 or 2 semesters) in EU and non-EU countries, Double Degree programs, and Special Programs for students enrolled in specific Study Programs (e.g. Alliance4Tech).

Due to procedural timelines, interested students must apply the year before the planned mobility period.
The choice of possible exchange destinations must be made at the same time as submitting the application to the mobility call. Students are therefore encouraged to gather all the necessary information about each selected destination, out of respect for all applicants.

In fact, declining an assigned destination due to inadequate research into the educational offer results in a lost opportunity, not only for the student who withdraws, but also for other students who could have taken advantage of that placement.

Once they have applied to the call, candidates must carefully follow the deadlines, monitor the rankings, and confirm or decline their interest in the assigned destination, if any. Dates vary for each call, but this phase of the process generally takes place between January and March for the first call, and between May and July for the second call.

Only after the candidate has confirmed the assigned destination, the International Mobility Unit will proceed with the official nomination of each student to the selected host institution. Delays in confirming the destination will result in exclusion from the exchange program.

To view the list of available destinations, students can refer to:

- the section of the Polimi website dedicated to the mapping of all partner universities. By filtering by School and Study Program, students can access useful information about each destination;
- the Exchange your Mind section of the Polimi website, which collects testimonials, useful information, presentations, and in-depth materials on the topic.

An international experience is valuable in its entirety, it allows students to discover new countries, cultures, people, and languages. These aspects should be taken into account when choosing a destination.
At the same time, it is important to remember that it is not always possible to obtain one of the top-listed choices; therefore, each option included in the list of preferred destinations should be selected carefully and thoughtfully.

Students who independently organize their period of study abroad are referred to as *"Free Movers."* This type of mobility is not part of any structured exchange program organized by Politecnico di Milano, such as Erasmus.
Since it is not a structured and formal program, *Free Mover* candidates must take care of all aspects of their stay abroad on their own (contact with the host university, meals, accommodation, health insurance, etc.), and no financial support is provided for expenses related to the mobility period.
The activities eligible for recognition within a *Free Mover* experience include course attendance or thesis work, with different requirements applying to the application and approval process by the Study Program/thesis supervisor.
The application for a *Free Mover* mobility may be approved by the student's *Corso di Studi* (Study Program) only if certain criteria are met. These include an evaluation of the student's CV and an assessment of the reputation of the host institution where the mobility is intended to take place. The specific criteria are detailed below:
• The host institution for the mobility cannot be one for which there are existing exchange agreements with Politecnico di Milano for the School to which the student is enrolled;
• The host institution must be recognized as a quality institution within the student's Study Program, and applicants must describe and demonstrate the validity of the proposed institution (a high ranking position in international university rankings can be one criterion, although not the only one);
• The Free Mover candidate must have a specific weighted average exam grade of at least 24 out of 30.
Students enrolled in a Degree Program who have already earned at least 60 University Educational Credits (ECTS) in their academic record may apply for a *Free Mover* mobility.
Similarly to the institutional mobility organized by Politecnico di Milano, Free Mover mobility is not permitted during the first semester of the Master's degree. However, students may submit their application during their first semester for mobility periods in subsequent semesters.

The Politecnico di Milano offers students numerous international mobility opportunities, starting with the Erasmus+ program, promoted by the European Commission to encourage cooperation between European universities. Furthermore, it has numerous agreements with partner universities outside Europe.

The Study Programme has a dedicated Erasmus coordinator who supports interested students in defining their study plan and assessing equivalencies.

Participation in the Erasmus program is significantly higher among MSc students than among BSc students. Following the COVID-19 pandemic, mobility has seen a renewed

increase: over the past three years, approximately 150 students have participated in international programs, with a clear preference for Erasmus, while participation in non-EU exchanges also remains high.

The most popular destinations are France and Spain, followed by Germany and Norway. Furthermore, the percentage of female and male exchange students is increasing, reaching 38% in the 2023-2024 academic year.

The updated list of locations is available on the internationalization page. Currently, 63 Erasmus agreements and 34 bilateral agreements outside the EU are active.

For the most motivated students with excellent academic records, double degree programs with partner universities are also available, governed by specific agreements (6 non-EU and 11 EU). In recent years, an average of four students per year have participated in these programs, equally distributed between European and non-European destinations.

Many students also choose to complete their theses at international universities, research institutes, or companies, primarily in Europe. Over the past three years, approximately 15 students have chosen this path.

Can I do an internship?

The stage, also referred to as internship (*tirocinio*), is an educational experience in the professional world, allowing students to put into practice the skills acquired during their academic path, and to guide them toward making informed future career choices.

It can take place either in Italy or abroad, in companies, professional firms, foreign universities, or public and private research institutions.

The stage is considered as **curricular** when it is aimed at students. Specifically, it can be:

- *curriculare obbligatorio* (compulsory curricular), linked to the acquisition of University Educational Credits (ECTS) and included in the Study Plan;
- *curriculare opzionale* (elective curricular), linked to the acquisition of University Educational Credits (ECTS) and included in the Study Plan at the student's discretion;
- *curriculare facoltativo* (curricular but voluntary), not involving the acquisition of ECTS and not included in the Study Plan, with a maximum duration of 12 months, to be completed before the thesis defense.

The extracurricular stage is instead intended for recent graduates who are not enrolled in any other university Study Program, and may last up to a maximum of 6 months.
More information: *Stage per laureati* (Internships for graduates).

Students interested in a curricular stage, whether *obbligatorio*, opzionale or *facoltativo*, can visit the *Stage curricolari* (Curricular Internships) webpage for more information about:

- how to find internship opportunities (which is the responsibility of the student);
- the documents that the host organization must request from Politecnico di Milano (*Convenzione di Tirocinio* - Internship Agreement and *Progetto Formativo* – SAT – Internship Academic Structure).

Internship and Master's Degree Thesis

The optional curricular internship and the *Laurea Magistrale* (Master of Science) thesis are two separate activities. The first is optional and does not allow for the acquisition of University Educational Credits (ECTS), while the second is mandatory and involves the acquisition of credits.

It is not excluded that the activity carried out during an optional curricular internship could lead to a Master's Degree thesis. However, for this to be possible, the research activity at an external organization must be carried out under the supervision of an academic advisor from Politecnico di Milano, who must agree from the beginning of the internship on the research objectives and methodologies, and must supervise the activities throughout their execution. It is the student's responsibility to contact an academic advisor before the internship begins.

The program offers the opportunity to undertake optional curricular internships, supervised by the supervisor, Professor Maria Vittoria Diamanti. The professor approves the proposals submitted by students and promotes opportunities offered by companies.

Although they do not award academic credits, optional curricular internships are recorded in the student's academic record and appear in the Diploma Supplement, the official document that accompanies the degree and summarizes the student's academic career. This document, issued automatically and free of charge in Italian and English, also includes other extracurricular activities, such as Passion in Action initiatives, soft skills development, and international experiences.

In many cases, the internship can be linked to the thesis project. Many students, in consultation with a program instructor, choose to complete their thesis at a company.

How can I express my opinion?

Students' opinions are important, and Politecnico di Milano provides several tools through which students can express their views.

OPIS Questionnaire

The *OPIS questionnaire* is the official tool used to collect students' opinions on teaching. The questionnaires are anonymous and results are processed in aggregate form.

The outcomes of these questionnaires are essential for instructors and *the* Study Programs Councils, as they offer insight into students' thoughtful and honest feedback, helping to improve both the educational offer and teaching methods. Once a year, every Study Program Council is required to reflect on its educational path, starting also from the results of these questionnaires. Student Representatives are involved in this process, collaborating in the definition of possible improvement actions.

For this reason, it is important that students express their opinions responsibly, in the interest of the entire academic community of students and faculty.

Students are asked to give their opinion on every course they attended during the semester, by answering a questionnaire that gives students the opportunity to directly contribute to the improvement of the quality of education. For each course, the questionnaire becomes available approximately two-thirds into each semester, and its completion is mandatory before registering for exam sessions for the first time.

Graduating Students' Questionnaire

During the final year of the Study Program, students are also required to give their opinion on the entire educational path. Completing the questionnaire is mandatory in order to register for the Bachelor's/Master's Degree graduation session (Graduating Students' Questionnaire). In this survey, students are asked to provide feedback on several aspects, including the organization of teaching, specific course content, facilities, internships, international mobility opportunities, and the final examination.

Student Services Satisfaction Questionnaire

This questionnaire is mandatory for registration to the first exam session of the academic year and is intended only for regular students in the final year of their Study Program. The questions concern the services offered to students, including, for example: enrolment procedures, Study Plan submission, exam registration, tuition fees, student offices, ICT, libraries, dining services, and communication.

How can I contribute?

Role of Student Representatives

Student representatives play a key role in ensuring the proper and transparent functioning of the University's governing bodies, where they participate to bring the students' perspective. They are elected every two years and serve not only as points of reference for students in various aspects of university life, but also contribute concrete proposals to improve the student experience.

The **Senato Accademico** (*Academic Senate*) is the body responsible for guiding and planning the University's development, with particular focus on teaching and research, and oversees the overall proper functioning of the institution. The Consiglio di amministrazione (Board of Directors), on the other hand, defines the long-term financial planning based on the proposals and opinions of the Senate. Therefore, the student representatives in these bodies are involved in decisions that affect the entire University.

The Joint Student-Professor Committees (Commissione paritetica) of each of the four Schools (3I – Industrial and Information Engineering; ICAT – Civil, Environmental and Territorial Engineering; AUIC – Architecture, Urban Planning and Construction Engineering; Design) monitor the educational offer, the quality of teaching and student services, and make proposals to enhance them. Depending on the School, some or all of the representatives on the Joint Student-Professor Committee also sit on the School Council, which coordinates the study programs and provides general guidance to the School.

The members of the Academic Senate, the Board of Directors, and the Joint Student-Professor Committees form the **Student Council**, a body where discussions take place on topics addressed within the various governing bodies. At the beginning of their term, they also elect the student representatives to the *Nucleo di Valutazione* (*Evaluation Committee*), the *Comitato Unico di Garanzia* (*Guarantee Committee*), and the Sports Committee.

Each **Study Program** has a certain number of student representatives (the number varies depending on the number of enrolled students). Student representatives are full members of the **Study Program Council**, the body responsible for defining the Degree Program and Educational Rules for each Study Program. In this context, student representatives contribute to defining how teaching is delivered, analyzing the effectiveness of courses, organizing the study plan, and acting as spokespersons for their fellow students by reporting any issues related to teaching.

If you want to learn more about the role of representatives, as well as the different representation lists present at the Politecnico, we invite you to visit the page **Polimi – Rappresentanti e Associazioni**.

Work with Us as a Tutor

Politecnico di Milano offers students the opportunity to carry out tutoring activities as part of paid collaborations within the University:

- If you are a Master's degree student, you can support teaching through tutoring activities.
- If you are a Bachelor's degree student, you can take part in *Peer-to-Peer* tutoring activities, assisting fellow students along their academic path.

These collaborations are assigned through specific calls for application and are reserved for students who meet certain academic and financial requirements. Compensation and the number of working hours vary depending on the assigned role.

For more details on requirements, application procedures, and deadlines, visit the page: Polimi - Paid Collaborations.

What's next?

The Career Service is the professional guidance and placement service of the Politecnico di Milano. It works in collaboration with employers (both private and public companies) and with the Study Programs Councils to offer students, starting from their early academic years, a wide range of initiatives aimed at bringing them closer to the professional world. The goal is to broaden their perspective by presenting them with future opportunities in terms of promising sectors and the most in-demand roles and skills.

Among the services offered by the Career Service:

- **Personalised support programs** with a *Career Advisor*, providing tips for preparing an effective CV, simulating job interviews, and more. Discover more in the video resources.
- **Special orientation pathways** to explore professional roles in innovation (Am I an Innovator?) across a variety of settings, from roles in established companies to positions involved in launching new start-ups.
- **Support in identifying internship opportunities**, both before and after graduation (*Internships*), as well as assistance in setting them up and formalising them through an *Internship Advisor*.
- **Organisation of orientation and mentoring events** with Italian and international companies (e.g. roundtables, career talks, career competitions, company tours), regularly posted on the website: [**Career Service**].

Various activities are organized by the Study program, specifically:

- A meeting to present the thesis topics proposed by the various research groups, in order to guide students in choosing the thesis topic that most interests them; the meeting is open to both first- and second-year students.
- During the Cementitious and Ceramic Materials Engineering course, first semester of the second year, a meeting with a Career Service representative is proposed. This representative will explain the available options, such as meetings with companies (Career Day), one-to-one appointments for orientation and CV writing, etc.
- The PhD program in Materials Engineering offers both PhD shadowing, where a student shadows a PhD student for a day to understand their typical day, and a day of poster presentations of the PhD students' activities. MSc students are

invited to participate and are tasked with selecting the best poster of the day. This is to actively involve them in the day and encourage them to take an interest in the topics covered.

Contacts

Coordinator/President of the Study Programme: Giovanni Dotelli

Study Plans: Mirella Del Zoppo

Admissions: Claudia Marano – Gianmarco Griffini

Graduation/Final exam: Luca Nobili

Transfers and programme changes: Luca Andena

International Mobility: Marco Ormellese – Francesco Briatico Vangosa

Orientation: Maria Vittoria Diamanti – Gianmarco Griffini

Tutoring: Paola Gallo Stampino

Internship: Maria Vittoria Diamanti

Student Representatives: rappresentastudenti-ccsmateriali@polimi.it

Teaching Secretariat:

Useful links

Website of the School of Industrial and Information Engineering

Study Programme Programme Website: https://www.ccs-matnano.polimi.it/en/home-eng/

Instagram Channel

https://www.instagram.com/matnano_polimi/

Student Office: Online counter

Campus and Services: Equal Opportunities and Inclusion , Psychological Well-being