Politecnico di Torino

ACADEMIC REGULATIONS
Master's degree programme
in
MECHANICAL ENGINEERING

Department of Mechanical and Aerospace Engineering
Collegio di Ingegneria Meccanica, Aerospaziale e dell'Autoveicolo

Academic Year **2025/2026**

The English translation of this document is provided as a support to the student community and has no legal effects. The Italian version shall constitute the sole authentic text and will be referred to for any legal matters.

SUMMARY

Art. 1 – Specific learning objectives and career prospects

1.1 Specific learning objectives

The specific objective of the Master's degree programme in Mechanical Engineering is to train professionals who can work in the industrial sector on complex design tasks, managing, maintaining, and operating complex systems (such as industrial plants, production lines, and transportation systems), and contributing to R&D departments with the ability to independently carry out projects—potentially innovative—in both product and process development. Graduates should be able to work independently or as part of multidisciplinary teams, often with coordination responsibilities.

The specific educational objectives include:

- deepening the foundational knowledge in mechanical engineering, with a high-level understanding of the scientific and technical issues underlying engineering applications and innovations (materials, functional and structural design methodologies, energy systems, manufacturing systems, numerical modelling);
- developing the ability to monitor processes, products, systems, and services to control and maintain them—also predictively—and to inform users and managers, ensuring quality, safety, and energy efficiency throughout the entire life cycle of a product or system;
- fostering the ability to work in interdisciplinary teams, with a focus on innovation;
- acquiring the ability to integrate the knowledge gained and to interact with specialists from different fields;
- gaining awareness of economic issues and the organisational models of companies;
- acquiring in-depth knowledge and solid skills in one of the traditional fields of mechanical engineering (manufacturing and related planning, design, automation, plant engineering, propulsion and traction of ground vehicles, and transportation).

1.2 Career prospects

The Master's degree programme aims to train a variety of professional profiles. The career prospects and the main functions and competencies associated to each profile are illustrated below.

Professional profile	Main functions and competencies
Product and Systems Design Engineer	Functions: Modelling and functional, thermal, and structural design of mechanical systems and assemblies, including highly complex ones, with a particular focus on future product disposal and environmental sustainability; design of automatic, mechatronic, and robotic systems with various types of actuation (mechanical, pneumatic, electric, hydraulic); design and management of the construction of industrial plants; design of material treatment systems; modelling and design of fluid machines, thermal and hydraulic systems; design of propulsion systems for vehicles; design and maintenance of transport systems, facilities, and terminals; selection and definition of control systems; participation—also with coordination responsibilities—in Research and Development activities related to components and systems, including the definition, organisation, and supervision of the necessary activities for their improvement and innovation. Competencies: • Functional and structural design in both static and dynamic contexts; thermo-fluid dynamic design of fluid machines and energy systems; selection of materials and appropriate treatments for their intended use; definition of experimental plans and testing methodologies for the assessment and improvement of product characteristics, quality, and reliability; • failure analysis of components and systems in case of malfunction or failure, in accordance with established protocols; definition of approval and testing protocols. Potential Employers: Design departments of industrial companies and service providers; R&D departments of industrial companies.

Product, Systems, and Process Development/Management Engineer	Functions: Programming and management of automatic systems; management of thermal systems and facilities; management of thermal processes and treatments for materials; development and management of fluid machines and energy systems for both stationary applications and transport of people and goods; management, maintenance, and operation of systems, facilities, and infrastructure for the transport of people and goods. Competencies: In relation to the above functions: • assessment of functional characteristics and performance; • development, management, and control of systems; • definition of operating procedures; • failure analysis of components and systems; • evaluation of the sustainability of complex products, processes, and systems. Potential Employers: Management and development departments of industrial companies and service providers.
Production Engineer	Functions: Design of production systems; design of manufacturing processes with a focus on environmental sustainability; management and operation of production systems; management and logistics of industrial facilities, including the digitalisation of processes and procedures. Competencies: Identification of production systems and strategies based on product type and production volumes, including additive manufacturing; design of production systems, machine tools, and equipment for manufacturing processes; detailed design and development of production tools; detailed design and development of equipment for stamping, forming, casting, and moulding systems; failure analysis of production system components in the event of breakdown or malfunction, in line with established protocols; use of CAD/CAM systems and rapid prototyping technologies; numerical simulation of manufacturing, stamping, forming, casting, and moulding processes; logistics, techno-economic management, and maintenance of industrial plants, including knowledge of digitalisation techniques; decision-making skills to manage workplace safety, with awareness of professional and ethical responsibilities. Potential Employers: Management and logistics departments in industrial companies Departments responsible for operating production systems in industrial companies Design and R&D departments for production systems and manufacturing processes in industrial companies

1.3 Professional profiles (ISTAT codes)

With reference to the list of professional profiles classified by ISTAT (Italian National Institute of Statistics, https://www.istat.it/en/), graduates from this Master's degree programme can work as:

ISTAT code	Description
2.2.1.1.1	Ingegneri meccanici
2.2.1.3.0	Ingegneri elettrotecnici e dell'automazione industriale
2.2.1.7.0	Ingegneri industriali e gestionali

Art. 2 – Admission requirements

Italian regulations on enrolment in Master's degree programmes require Italian universities to check that applicants meet the following requirements:

- have a **three-year Bachelor's degree or university diploma**, or **other educational qualification obtained outside Italy** and recognized as suitable for admission;
- meet specific curricular requirements;
- have an **academic performance considered suitable** for admission.

CURRICULAR REQUIREMENTS

As far as curricular requirements are concerned, applicants must have a Bachelor's degree or a three-year university diploma, or an educational qualification obtained outside Italy and recognized as suitable for admission. In addition, they must have gained specific knowledge and competencies during their previous academic path (credits in specific Scientific Disciplinary Fields).

In particular, applicants must have earned:

- minimum 45 credits earned in the following Scientific Disciplinary Fields (settori scientifico-disciplinari): CHIM/07, FIS/01, FIS/03, ING-INF/05, MAT/02, MAT/03, MAT/05
- minimum 60 credits earned in the following specific Scientific Disciplinary Fields (settori scientifico-disciplinari): ICAR/01, ING-IND/08, ING-IND/10, ING-IND/12, ING-IND/13, ING-IND/14, ING-IND/15, ING-IND/16, ING-IND/17, ING-IND/21, ING-IND/22, ING-IND/31, ING- IND/32, ING-IND/35, SPS/09.

The credits of the Scientific Disciplinary Fields found both in the first group and in the second group are primarily counted for the first group. The remaining credits are counted for the second group. Therefore, the credits of a course can be counted partly to reach the minimum number of credits of both groups.

Applicants who lack less than **10 credits** may be admitted to the programme by the Academic Advisor. For applicants who lack **more than 10 credits**, the evaluation will be subject to the final approval of the Coordinator or the Vice coordinator of the degree programme.

Applicants who do not meet the curricular requirements are required to make up for their unfulfilled curricular requirements (missing credits) before enrolment, by means of:

- **enrolment in single courses in order to make up for unfulfilled curricular requirements**: this is possible for students who need to earn up to a maximum of 60 credits. Students who enrol **in single courses for this reason are allowed to include in their Personal Study Plan exclusively the courses assigned by the evaluator.**
  or else,
- **credit transfer** at Bachelor's level: this is possible for students who need to earn more than 60 credits. In this case, students need to enrol in the Bachelor's degree programme that offers the credits in the specific Scientific Disciplinary Fields (core subjects and commentary subjects) required for admission to this Master's degree programme.

SUITABLE ACADEMIC PERFORMANCE

Applicants must have a suitable academic performance and an English language certificate (B2 level or above, as defined by the Common European Framework of Reference for Languages: Learning, Teaching, Assessment - CEFR).

The academic performance will be assessed as follows.

1) Applicants from Politecnico di Torino

Applicants can be admitted to the programme if they earned their Bachelor's degree in:

- 4 years (1) or less - no exam average grade required ;
- between 4 and 5 years (1) –exam weighted average grade required (2): ≥21/30
- more than 5 years– exam weighted average grade required (2): ≥ 24/30

The weighted average grade is calculated on all accrued course credits (graded on a scale of 30) counting towards the achievement of the Bachelor's degree, after having subtracted the worst 28 credits.

The duration of the Bachelor's path is calculated on the basis of the number of academic years in which the applicant has been enrolled at the university, starting from the first enrolment in the Italian university system:

- for full-time students: the duration of the Bachelor's path is equivalent to the number of academic years of enrolment.
- for part-time students: each year of enrolment is counted as half-year.
- for full-time students taking part in the "Dual Career" programme: each year of enrolment is counted as half-year, as for part-time students.

In the event of credit transfer, the duration of the Bachelor's path must be increased proportionally to the number of credits that have been recognized by Politecnico (10-60 CFU =1 year, etc.). The worst 28 credits must be subtracted proportionally to the number of validated credits.

(1) Applicants must have graduated by the end of the December Graduation Period
*(2) The weighted average is calculated as follows: ∑(grade*credits) / ∑credits*

2) Applicants from other Italian universities

Applicants who have a Bachelor's degree awarded by another Italian university must have a weighted average grade of all the exams ≥ **24/30**, regardless of the number of years it took them to graduate. The weighted average grade (∑(grade*credits) / ∑credits) is calculated on all accrued course credits (graded on a scale of 30) counting towards the achievement of the Bachelor's degree, after having subtracted the worst 28 credits.

3) **Applicants with a non-Italian educational qualification**

To be admitted to Politecnico Master's degree programmes, applicants must have an academic qualification awarded by an accredited/recognized foreign university, earned after completing at least 15 years of total education (including primary school, secondary school and university).
Applicants who have attended a university programme lasting five or six academic years (different from the 3+2 system) without completing it must still meet the minimum requirement of 15 years of total education (of which at least 3 years at university level) and they must have earned at least 180 ECTS credits or equivalent. Pre-university courses or foundation years cannot be counted towards the minimum number of credits or the minimum numbers of years of total education mentioned above.
In addition to having an adequate academic background and certified knowledge of English at least at B2 level, students applying for degree programmes taught entirely or partially in Italian must also have a B2 level Italian language certificate, as defined by the Common European Framework of Reference for Languages (CEFR), as an admission requirement.
The applicant's academic performance and the consistency between the degree programmes offered by Politecnico and the applicant's previous academic background are assessed by the professors designated by Coordinator of the Collegio. The evaluation is carried out on the Apply@polito platform under the section called "applicants with a non-Italian qualification."

A positive evaluation (offer of admission) allows applicants to enrol in the programme only in the academic year in which the application has been submitted. Admitted applicants who do not complete the enrolment process within the deadlines are required to apply again to the programme in the next academic years.

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More information is available at https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/master-s-degree-programmes

Art. 3 – Programme curriculum

3.1 Programme overview

The programme includes a common in-depth group of subjects, mainly offered in Year 1, which covers several disciplinary areas. In Year 2, students can choose among different tracks with specialised courses grouped into coherent thematic areas, reflecting the main professional roles traditionally covered by mechanical engineers.

The in-depth areas of the common group are:

- Materials
- Modelling and numerical methods
- Functional and structural design
- Production systems
- Energy
- Economics and management

Students can choose among the following specialist tracks:

- Automation
- Additive manufacturing
- Mechanical production
- Plant design
- Mechanical design
- Propulsion systems for land vehicles
- Transport systems

The common courses are offered in both Italian and English. Each group includes courses taught in English.

At the end of the programme, students are required to write a thesis, which may focus either on complex design activities (product, process, or plant) or on original applied research. The thesis aims to demonstrate not only the students' mastery of the topics covered but also their ability to tackle new challenges and work independently within an industrial or research environment.

3.2 Organization of educational activities

The list of courses (compulsory and optional), curricula, possible organization of courses into modules, any pre-requisites and exclusions and the list of the faculty members responsible for the courses are available at:

- Ingegneria Meccanica: https://didattica.polito.it/pls/portal30/sviluppo.offerta_formativa_2019.vis?p_coorte=2026&p_sdu=32&p_cds=565&p_ori=17335
- Mechanical Engineering: https://didattica.polito.it/pls/portal30/sviluppo.offerta_formativa_2019.vis?p_coorte=2026&p_sdu=32&p_cds=567

The list of the Scientific Disciplinary Fields (Settori Scientifico Disciplinari) for each activity (specific subjects and complementary subjects) is available at: https://didattica.polito.it/pls/portal30/sviluppo.vis_aiq_2023.visualizza?sducds=32565&tab=0&p_a_acc=2026

Art. 4 - Student career

The Student Guide is published on the Teaching Portal every year before the beginning of the academic year. There is a specific Student Guide for each Master's degree programme. The Student Guide is available on the web site of the degree programme.

It contains information and deadlines on:

- academic calendar;
- Personal Study Plan and Annual Personal Study Plan;
- free choice credits;
- internships;
- tuition fees;
- dual career;
- classes and exams;
- class delivery;
- foreign language learning;
- studying abroad/mobility programmes;
- exam rules;
- transfers in/out and internal transfers;
- interruption, suspension, withdrawal, forfeiture;
- credit transfer.

Art. 5 - Final Examination

The final examination represents a significant educational milestone of the Master's degree programme and consists of a thesis that must be developed originally by the students under the supervision of a supervisor. Students required to independently conduct an in-depth study of a technical or scientific design problem, critically review the available documentation, and elaborate on the problem by proposing suitable solutions.

Students can carry out their thesis projects at the University's departments and laboratories, at other Italian or foreign universities, at external research laboratories, or within industries and professional firms with which collaborative agreements have been established.

Students are required to publicly present and discuss their thesis (oral defence) in front of a Graduation Examining Committee. Candidates must demonstrate the ability to work independently, mastery of the topics addressed, and skill in synthesising and communicating the content effectively during the discussion.

The thesis may also be written and presented in English.

The final examination is worth 18 credits, corresponding to approximately 450 hours of full-time work.

Students must submit their thesis application and request the thesis topic online through a dedicated procedure available in their personal page on the Teaching Portal, under the section entitled "Thesis," in compliance with the Graduation Periods deadlines published in the Student Guide – Thematic Calendar Section.

The Graduation Examining Committee gives the final grade evaluating the student's overall academic path, his/her maturity, capacity for intellectual reasoning and the quality of the thesis.

The members of the Graduation Examining Committee evaluate the overall average grade of all the exams on a scale of 110. The committee may add up to a maximum of 8 points, considering the following factors:

- Evaluation of the work carried out for the thesis (commitment, autonomy, and methodological rigour, use of technical-scientific jargon, etc);
- Presentation of the thesis ì
- Educational path (number of exams passed with honours, experiences at foreign universities and research centres, extra-curricular activities, participation in Student Teams, etc.)

A degree with honours (lode) may be awarded if the total score is at least 110 at the Committee's discretion and by qualified majority, meaning at least two-thirds of the committee members.

If the thesis meets the required standards, the Committee may grant the *dignità di stampa* (printing honour) only if the final grade is 110 cum laude and the Committee's decision is unanimous.

More Information and Deadlines:

- Student Regulations
- Student Guide

Diploma Supplement:

In compliance with article 11, paragraph 8, of Ministerial Decrees No. 509/1999 and 270/2004. Politecnico di Torino issues the Diploma Supplement, a document that can attached to a higher education qualification. It is designed to improve the transparency of international qualifications, as it provides the description of the curriculum successfully completed by the student. This certificate follows the European model developed by the European Commission, the Council of Europe and UNESCO – CEPES: it is issued in two languages (Italian-English) and it is composed of approximately 10 pages.

More information at https://www.polito.it/en/education/applying-studying-graduating/academic-experience/certificates-and-other-documents

Art. 6 - References

6.1 Student Regulations

The Student Regulations define the rights and responsibilities of students and set out the administrative and disciplinary rules that all students enrolled in a degree programme or in a single learning activity at Politecnico must abide by.

6.2 Other Regulations

Particular aspects of students' academic progress are governed by specific Regulations or Calls for Applications published on its website.

In particular:

- The Tuition Fee Regulations specify the annual tuition fees that students must pay. The procedure for requesting a tuition fee reduction is explained in a dedicated guide.
- The University Regulations on Funds for Student Mobility Abroad outline the principles and rules for awarding and disbursing mobility grants. Standard procedures apply to all types of mobility programmes with unified Calls for Applications published twice a year at https://www.polito.it/en/education/applying-studying-graduating/studying-abroad.
- The Code of Ethical Conduct also applies to students.