Politecnico di Torino

ACADEMIC REGULATIONS

Bachelor's degree programme
in
AUTOMOTIVE ENGINEERING

Department of Mechanic 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 matter.

SUMMARY

Art. 1 - Specific learning objectives and career prospects

1.1 Specific Learning Objectives

Recent studies on the trends in the automotive industry highlight how the increasingly strict regulations on fuel consumption and vehicle emissions have prompted companies to fundamentally rethink the design of vehicles.
In recent years, a clear shift toward electrification has emerged, to the extent that the majority of vehicles in the coming years will be either hybrid or fully electric. Another recent trend concerns electronics and information technology: the availability of high-speed connectivity through 5G networks, the integration of onboard sensor systems, and increasingly powerful processing capabilities will make future vehicles both connected and autonomous. At the same time, topics such as additive manufacturing and Industry 4.0 are driving a profound transformation of production processes.
Considering these developments, the automotive industry is placing growing emphasis on these areas and calling on universities to train product and process engineers capable of working on systems where these highly interdisciplinary topics converge.

The Bachelor's degree programme in Automotive Engineering has been designed to respond to these needs. The courses included in the study plan are focused on providing interdisciplinary foundational knowledge in mechanics, internal combustion engines, electric motors, power and control electronics, and production technologies.
Moreover, the strong educational impact of student participation in Student Teams has proven to be highly beneficial. The opportunity to apply acquired knowledge to real-world cases generates high levels of motivation among students.

The specific learning objectives of the degree programme include:

- gaining system-level understanding of vehicles, their main subsystems, and their manufacturing processes, namely:
  - basic knowledge of electric systems for vehicles
  - vehicle performance and the main components involved
  - production and assembly processes
  - control systems and their applications
  - electric machines
- the ability to apply acquired knowledge to the design of automotive components
- the ability to work in interdisciplinary teams.

1.2 Career prospects

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

Professional Profile	Main functions and competencies
Junior Product Design Engineer	Functions: Design of components and subcomponents of the following systems (for vehicles with conventional, hybrid or electric propulsion): • Powertrain • Suspension, steering and braking systems • Bodywork or components of vehicle interiors. Competencies: • Modelling and structural behaviour of mechanical and body components. • Design of subcomponents and parts for: ▪ transmissions (conventional, hybrid, and electric) and their subsystems ▪ body structures. Potential employers: Automotive component suppliers and related companies. Metalworking and mechanical industries.

Junior Process Engineer	Functions: • Definition of the production process for components and subcomponents of the main vehicle subsystems • Functional and economic validation of production processes • Design and specification of production equipment • Quality control of manufacturing processes • Solutions to optimise production processes (e.g. reducing energy consumption and pollutant emissions). • Interface with suppliers of machine tools and semi-finished products to source and assess opportunities for process optimisation. • Support logistics for manufacturing. Competencies: • Manufacturing technologies • Product and process quality analysis • Management of handling systems and warehouse logistics • Cost and value analysis of products • Plant logistics analysis Potential employers: Automotive component suppliers and related companies. Metalworking and mechanical industries. Manufacturers of machinery and equipment for the automotive sector.
Preparation for further studies	**Required knowledge for admission to the Master's degree programme in Automotive Engineering**:
	Students must possess foundational knowledge in mathematics, physics, mechanics, thermodynamics and machines, materials and their mechanical behaviour, electrical engineering, electronics, electric machines, automatic controls, manufacturing technologies, machine design and drafting, and the behaviour of vehicles and their main components. They must be able to identify missing information to solve specific problems and know how to get such information. They must be capable of working independently and managing projects. They must also be able to communicate effectively, either directly or through appropriate documentation and media.

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/), a graduate from this Bachelor's degree programme can work as:

ISTAT code	Description
3.1.3.1.0	Tecnici meccanici
3.3.1.5.0	Tecnici dell'organizzazione e della gestione dei fattori produttivi

Art. 2 - Admission requirements

To be admitted to this Bachelor's degree programme, applicants must hold a high school diploma (as required by current regulations) or an equivalent qualification obtained abroad, recognized as valid. Additionally, they must have or attain an appropriate level of initial background knowledge.

The number of admissible students is determined annually by the Governing Bodies of Politecnico based on locally programmed admissions, considering the available facilities and the student-to-faculty ratio.

The number of available places and admission procedures are specified in the official Call for applications for admissions published at https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/bachelor-s-degree-programmes/calls-for-application-regulations-and-ranking-lists .

In particular, for enrolment in this Bachelor's degree programme, applicants must take an admission test (TIL-I), administered in different sessions according to a specific calendar published on the recruitment web pages.

The test is conducted using the technical equipment available in the computer laboratories of the University.

The minimum score required to be included in the ranking list is set at 30% of the total score. Applicants may take the TIL-I test up to a maximum of three times. In the event of multiple attempts, the highest score obtained by the applicant will be considered valid. The test consists of answering 42 questions in 1 hour and 30 minutes. These questions are divided into four sections covering four different subject areas: Mathematics, Reading Comprehension and Logical Reasoning, Physics, and Basic Technical Knowledge.

Applicants who score below 30% in the Mathematics section will have to fulfil some supplementary academic obligations (in Italian, Obblighi Formativi Aggiuntivi - OFA).

They will be invited to attend tutoring math classes during Year 1 and they must attend a supplementary course. This course, called C.I.A.O. - Corso Interattivo di Accompagnamento Online (Interactive Online Support Course), is normally offered in the week before the beginning of classes. It seeks to help applicants fill in the gaps in their Math knowledge through specific online tutoring sessions.

The OFA requirements will be considered fulfilled if, by the end of Year 1, at least one of the following conditions is met:

- students pass one of the two Mathematics exams of Year 1 (Mathematical Analysis I or Linear Algebra and Geometry);
- students pass the final test of the CIAO course by correctly answering at least 10 out of 15 questions. This test will be offered three times during the academic year.

Any exemptions from taking the admission test are specified in the Call for applications for admissions to the Bachelor's degree programmes of Politecnico di Torino.

This Bachelor's degree programme is delivered both fully in English and fully in Italian.

Students who wish to attend the English-taught programme must have an English language certificate (B2-level or above), as defined by the Common European Framework of Reference for Languages (CEFR) at the time of enrolment.

Students who wish to attend the Italian-taught programme must have an Italian language certificate (B2-level or above), as defined by the Common European Framework of Reference for Languages (CEFR) at the time of enrolment.

For more information regarding the Call for applications, the number of admissions, the admission test registration and enrolment procedures, please visit https://www.polito.it/en/education/applying-studying-graduating/admissions-and-enrolment/bachelor-s-degree-programmes/calls-for-application-regulations-and-ranking-lists .

Art. 3 - Programme curriculum

3.1 Programme overview

The degree programme begins with a first year shared by all Engineering degree programmes. The first semester of Year 2 focuses on fundamental engineering subjects (advanced drawing, physics, and mathematical analysis). This is followed by core courses in subject-specific areas, such as applied mechanics, materials science, electrical engineering and electronics.

In Year 3, the courses become more specialised and focus on machine design, manufacturing technologies, thermal and electric machines and automatic controls.

At the end of the programme students are required to work on a thesis project carried out. The specific learning objectives of the thesis are to:

- address engineering topics related to the degree programme and apply the acquired skills independently;
- document, present and discuss the results and methodologies used. Students must also demonstrate their ability to summarise and effectively communicate their work both in written form and during a public defence.

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:

- Automotive Engineering: https://didattica.polito.it/pls/portal30/sviluppo.offerta_formativa_2019.vis?p_a_acc=2026&p_sdu=32&p_cds=546&p_ori=17303
- Ingegneria dell'Autoveicolo: https://didattica.polito.it/pls/portal30/sviluppo.offerta_formativa_2019.vis?p_a_acc=2026&p_sdu=32&p_cds=545

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=32545&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 Bachelor's degree programme. The Student Guide is available on the web site of the degree programme.

It contains information and deadlines on:

- academic calendar;
- supplementary academic obligations (Obblighi Formativi Aggiuntivi - OFA);
- 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;P
- exam rules;
- transfers in/out and internal transfers;
- interruption, suspension, withdrawal, forfeiture;
- credit transfer.

Art. 5 – Final Examination

For the Final Examination students are required to autonomously prepare a written paper (final project) under the guidance of a supervisor.
The final examination aims to assess the student's ability to independently address a technical/scientific problem and to present the work carried out, effectively engaging in a technical discussion.
The final examination is worth 3 ECTS credits, corresponding to an expected workload of approximately 75 hours.
Students must submit their application online through a dedicated procedure available on their personal page of the Teaching Portal under the portlet called "Degree and Final Examination", ensuring they meet the deadlines for the desired graduation period as published in the Student Guide – Thematic Calendar section.

How to apply for the final examination

a) **Students who have already contacted a Politecnico faculty member (**Final Examination Supervisor) for their final examination must specify the agreed topic and the name of their Final Examination Supervisor. The Final Examination Committee will approve the proposal. If the Committee decides not to approve it, a new Supervisor will be appointed. This category also includes students who are members of a Student *Team* and wish to present their team activity as their final project; in this case, they must indicate the Student Team they are involved in and identify a Final Examination Supervisor together with the faculty member responsible for the Team.

b) **Students who directly request a topic for the final examination** will be assigned a Final Examination Supervisor by the Committee. Subsequently, students must agree with their Supervisors on the topic to be developed.

The final project must be approved by the supervisor before the deadline indicated in the Student Guide for submitting the Fibal Examination application. This approval, along with the successful completion of all exams, will allow the student to take part in the graduation session.

The final project must be submitted to the Supervisor uploading the PDF file to the shared folder on the Teaching Portal.

The final project may be written in English.

As a general rule, the final project should be between 10 and 20 pages in length and must follow internationally accepted standards for technical reports. The Supervisor will provide further guidance on formatting if needed.

The presentation must not exceed 15 minutes, including the defence. Presentations must generally consist of no more than 12 slides.
Students who have obtained the Advisor's approval will be admitted to the final examination in the corresponding session, according to the established calendar of presentations and graduation ceremonies.

The final grade is determined by the Graduation Examining Committee, which evaluates the overall average grade of the exams on a scale of 110 after having subtracted the 16 worst credits. This number is proportionally reduced if some of the exams have been validated without a grade (pass-or-fail exams) or in the event of credit transfer, since only the exams taken at Politecnico are taken into consideration for this calculation. Additionally, the Committee may add up to a maximum of 5 points to this average, considering:

- the evaluation of the written paper;
- the number of years it took the student to complete his/her studies;
- the evaluation of the educational path partially or totally in English;
- other information about the student's course of study (for instance, the number of exams passed with honours, experience abroad, extracurricular activities etc.).

Students enrolled at Politecnico for the first time starting from a.y. 2022/2023 (and following aa.yy.) who pass their first-year courses and the core courses offered in Year 2 (Mathematical Analysis 2 and Physics 2) by the end of the examination session which immediately follows the semester of first course attendance will get a bonus (0.5 points for each exam) that will be added to the final grade, up to a maximum of 4 points.

Honours may be awarded upon achieving a final grade of 110, at the discretion of the Committee and by a qualified majority (i.e. at least two-thirds of the committee members).

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 be 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.